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Editors

Yehuda Benguigui
Juan Carlos Bossio
Hugo Roberto Fernández

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Operations Research on Integrated Management of Childhood Illness –IMCI–

–Editors–

Yehuda Benguigui
Juan Carlos Bossio
Hugo Roberto Fernández

Child and Adolescent Health
Family and Community Health

525 23rd Street N.W.
Washington, DC, 20037-2895, USA

Telephone: (202) 974-3798
Internet: http// www.paho.org

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Preface

The commitment assumed by the countries during the Millennium Summit to reduce mortality in children under 5 by two-thirds over 1990 figures by the year 2015 restores the priority and importance accorded to child survival for improving the health of the population. In the Region of the Americas, meeting this target will require the continued strengthening of interventions for the prevention and effective treatment of infectious diseases, respiratory illnesses, and malnutrition, which are still responsible for roughly 30% of the deaths each year in children under 5. However, since these diseases and health problems no longer cause most of the deaths in this age group, attaining the Millennium Development Goals (MDG) will require the prevention and control of other health problems, such as peri-neonatal disorders, which account for 40% of the mortality in children under 5 and 60% of infant mortality.

Ensuring that more and more children survive the first years of life cannot be the sole objective of action to improve the health of the population. It must be complemented with interventions designed to provide all children with the proper conditions for growth and development. This is the only way to help boys and girls grow into healthy adolescents, young adults, and adults who can contribute to the development and growth of their families and communities.

Inspired by the growing efforts of the countries to attain the goals for 2000 of the World Summit for Children, Integrated Management of Childhood Illness (IMCI) was designed by the World Health Organization (WHO) and the United Nations Children's Fund (UNICEF) to integrate the interventions available in the mid-1990s into a single strategy for the prevention and control of prevalent childhood illnesses. During its adaptation and implementation, the strategy was enriched and expanded with the countries' experiences, strengthening one of its key innovations to promote child health--namely, its integrated and versatile nature, which permitted its adaptation to the epidemiological and operational situation in each location.

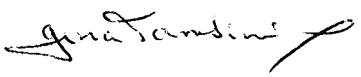
In the Region of the Americas, new components were added to IMCI from the outset. The strategy currently includes not only the prevention and treatment of other illnesses and health problems prevalent in children under 5, but a peri-neonatal component that covers the delivery, resuscitation, and integrated care of newborns and neonates, a component that is also linked with interventions targeting women's and maternal health.

The widespread acceptance of IMCI since its inception in the mid-1990s and its expansion through the health services to the community and the family have buttressed its role as a key strategy for attaining the goals of the World Summit for Children, and more recently, the Millennium Development Goals. IMCI, moreover, has given the countries a strategy that has integrated interventions for child survival with others designed to ensure growth and development during infancy and childhood.

Monitoring and evaluation activities have proven critical in the implementation of IMCI, and they have added to the knowledge about the strategy's effectiveness in the clinical practice of health workers in terms of treatment, the prevention and control of diseases, and health promotion. In this regard, the operations research projects described in this volume have been very useful practical instruments for health services personnel and those responsible for planning, monitoring, and evaluating plans and projects in the health services and community. The adaptation and use of these protocols have made it possible to determine the impact of the IMCI strategy and to study other aspects of child health, in many cases revealing the need and importance of adapting the contents of IMCI and complementing them with other interventions in the areas of prevention, treatment, or health promotion.

Thus, the IMCI operations research projects are presented as a tool to support the ongoing identification of problems and actions to solve them and to assess the impact of these actions. Within this context, these protocols are expected not only to demonstrate the impact of the strategy on child health, but to provide more in-depth knowledge about the health situation of children, in addition to boosting local capacity to identify and solve problems.

In light of all this, it is hoped that just as the benefits of the IMCI strategy extend beyond child health, improving the ability of families to prevent disease and promote health, the application of these protocols will also extend beyond actions in child health, upgrading the skills of all people working in local health services and the community to improve the health of the population.



Dr. Gina Tambini
Manager
Area of Family and Community Health
PAHO/WHO

Foreword

Efforts to control illnesses and other life threatening conditions have been undertaken for centuries. The quest to find causes and solutions to these problems has been well documented. In recent decades we have witnessed the ongoing discovery of new threats to our health and the concomitant development of measures to control them. Strategies for prevention, diagnosis, and treatment are presently available for most diseases, and their application has impacted the increased life expectancy of the population.

Nevertheless, the advanced knowledge and technology of disease prevention and control are still inaccessible to entire world's population. Unfortunately, even when available there may be barriers to implementing this knowledge.

Lack of access to knowledge and modern technology has become a critical concern in recent years. Designing new strategies to guarantee universal access is fundamental if we are to move toward equitable health conditions for the entire population.

Integrated Management of Childhood Illness (IMCI) is an example of a new strategy for guaranteeing that all children under 5 years have access to basic measures for diagnosis, treatment and prevention on the most common illnesses, in addition to general measures to promote their health. This strategy will enable health care workers and communities to access knowledge and technology to benefit millions of children.

Within this conceptual framework, implementing the IMCI strategy poses an ethical challenge: to guarantee equitable access to interventions that are key to the survival and the proper growth and development of children.

IMCI will not however, be available immediately to all children. In striving to ensure that as many children as possible benefit from this initiative all efforts should be made to accelerate effective implementation of the strategy. The timely implementation of the strategy will enhance children's access to health promotion by strengthening families, the community and health services concurrently.

The priority operations research studies on IMCI were designed as a tool for accelerating implementation of the strategy. The effort must enlist not only health workers, but also academicians and scientists working on problems and illnesses that affect child health. The primary purpose of the research protocols in this document is to offer practical tools for application at the local level, defined as the health services and the community. The use of the protocols will yield greater knowledge about the illnesses and health problems that affect them and facilitate the identification of priority areas to improve the health status of children. In addition, use of these protocols will assist evaluating the impact of the IMCI strategy and provide information to, modify technical and

operating standards while underscoring the importance of allocating sufficient resources to expand coverage of the strategy.

In launching this effort, the IMCI program considered the importance both of research, as a catalyst for improving the quality of care in the health services, and of the systematic evaluation of the results of the interventions for disease prevention and control. Operations research helps to enhance the role of the health services in generating knowledge and in collective efforts to improve the health of the population.

The operations research studies were also designed to establish closer ties between investigators and academicians, the health services and the community, through a joint effort to generate knowledge and evaluate the interventions included in the IMCI strategy.

The IMCI Program of the Pan American Health Organization hopes that these operations research protocols will be studied, discussed, adapted, and most importantly, applied in an accelerated manner thus extending the benefits of current knowledge and technologies for the prevention and control of childhood illness to all the population.

Yehuda Benguigui
Uni Chief
Child and Adolescent Health
Family and Community Health
PAHO/WHO

Juan Carlos Bossio
Chief, Department of Health Programs
Emilio Coni National Institute for Respiratory Diseases
Ministry of Health, Argentina

Hugo Roberto Fernández
Manager, Disease Prevention and Control
Vigia Program, Ministry of Health, Argentina

List of Professionals Involved in the Preparation and Review of the Document

Alencar, Dione, Alagoas Medical Science School, Brazil.

Almeida, Elenilde, Federal University of Sergipe, Brazil.

Almeida, Claudio, Director, Pan American Institute for Food Protection and Zoonoses (INPPAZ), PAHO/WHO. Martinez, Buenos Aires, Argentina.

Alves, Rosana, Rio de Janeiro Federal University, Brazil.

Amaral, João, Federal University of Ceará, Faculty of Medicine, Fortaleza, Brazil.

Andrade, Ana Lucia, Federal University of Goiás, Goiânia, Brazil.

Araújo, Eleite Cunha, Federal University of Pará, Belém, Brazil.

Arias, Sergio Javier, Chief, Division of Epidemiology, Emilio Coni National Institute for Respiratory Diseases, Ministry of Health, Santa Fe, Argentina.

Balanzat, Ana Maria, Physician in Chief of the Pediatrics Service, Clinics Hospital, Buenos Aires University, Argentina.

Baracat, Emilio, Faculty of Medical Science, UNICAMP, Brazil.

Barbosa, Grant, Pediatrics and Childcare Institute, Martagão Gesteira, Federal University of Rio de Janeiro, Brazil.

Barreto, Maria do Rosario, Secretary of Health, State of Bahia, Salvador, Brazil.

Barros Filho, Antonino, Hospital Antonio Pedro, Niteroi, Brazil.

Beltrán, Martha, Country Clinic, Bogotá, Colombia.

Benguigui, Yehuda, Unit Chief, Child and Adolescent Health, Family and Community Health, FCH/CA, PAHO/WHO, Washington D.C., U.S.A.

Bossio, Juan Carlos, Chief, Department of Health Programs, Emilio Coni National Institute for Respiratory Diseases, Ministry of Health, Santa Fe, Argentina.

Brasileiro, Maria Clezilde, Federal University of Pernambuco, Recife, Brazil.

Brunacci, Julio, Child Health Coordination, Ministry of the Health Brasilia, Brazil.

Burbano, Esmeralda, CIMDER Foundation, Universidad del Valle, Cali, Colombia.

Cabral, Belkys, Children's Hospital, Robert Reid Cabral, Santo Domingo, Dominican Republic.

Cabrera Meza, Gerardo, Baylor College of Medicine, Texas Children's Hospital, Houston, Texas, U.S.A.

Camargo, Paulo, Departament of Pediatrics, Federal University of Minas Gerais, Belo Horizonte, Brazil.

Carrizo, Juan, Universitary Hospital of Maracaibo, Zulia University, Maracaibo, Venezuela.

Cassani, Maria Cristina, Psychologist, Health Area VIII, Santa Fe Province Ministry of Health, Argentina.

Coelho, Sergio, Pediatrics and Childcare Institute Martagão Gesteira, Federal University of Rio de Janeiro, Brazil.

Concha-Eastman, Alberto, Regional Adviser on Violence and Injury Prevention. Sustentable, Development and Environmental Health Area, PAHO/WHO.

Costantini, Olga, Epidemiology Specialist, Santa Fe Argentina.

Chatkin, Jose Miguel, Professor, Federal do Rio Grande do Sul University, Porto Alegre, Brazil.

Chew, Francisco, Nutrition and Metabolism Center, Guatemala.

da Cunha, Antonio José Alves, Director of Pediatrics and Childcare Institute Martagão Gesteira, Federal do Rio de Janeiro University, Brazil.

da Paiixão, Antonio Carvalho, Federal University of Sergipe, Brazil.

Dos Santos, Silvia Reis, Pediatrics and Childcare Institute, Martagão Gesteira, Federal University of Rio de Janeiro, Brazil.

Espindola, Javier, IMCI Consultant, PAHO/WHO, Brasilia, Brazil.

Evangelista, Ivone, Anna Nery Nursing School, Rio de Janeiro Federal University, Brazil.

Fernández, Hugo Roberto, National Epidemiology Director, Argentina.

Ferreira, Ana Lucia, Pediatrics and Childcare Institute Martagão Gesteira, Rio de Janeiro Federal University, Brazil.

Ferrari, Ana María, Professor, Pediatrics Professorship. Faculty of Medicine, National University of Uruguay, Montevideo, Uruguay.

Ferreira, Sidnei, Pediatrics and Childcare Institute Martagão Gesteira, Federal Rio de Janeiro University, Brazil.

Figueiras, Amira, Federal University of Pará, Belém, Brazil.

Fontenelle, Maria Anice, National Foundation of Health, Brasilia, Brazil.

França, Francisco, Infectious Diseases Department, Clinics Hospital, Sao Paulo, Brazil.

Galvao, Luiz, Area Manager. Sustentable, Development and Environmental Health Area, PAHO/WHO. Washington, D.C, U.S.A.

Grissi, Sandra, Instituto da Criança, Clinics Hospital, Sao Paulo, Brazil.

Gusmão, Renato, PAHO/WHO Representative, Venezuela.

Hortal de Peluffo, Maria, Laboratory Department of Public Health, Montevideo, Uruguay.

Ippólito, Josefa, Regional Advisor on Health Promotion and Health Education
Healthy Setting Unit Area of Sustainable Development and Environmental Health
PAHO/WHO

Jaime Gaete, Luis, Regional Hospital Talca, Chile.

Jáuregui, César, Facatativa Hospital Director, Cudinamarca Department, Bogotá, Colombía.

Lacerda, Elisa Maria de Aquino, Nutrition Institute, Federal University of Rio de Janeiro, Brazil.

Lambrecht, Tierry, Division of Child and Adolescent Health, World Health Organization, Geneva, Switzerland.

Leite, Álvaro, Faculty of Medicine, Federal do Ceará University, Fortaleza, Brazil.

López, Emilton, Provincial Health Bureau, Perdize, Dominican Republic.

Lima, Eduardo Jorge, Maternal and Child Institute of Pernambuco, Recife, Brazil.

Lutter, Chesa, Regional Adviser on Nutrition, Program on Food and Nutrition, Family and Community Health, PAHO/WHO, Washington, D.C., U.S.A.

Maciel, Gilda, Federal University of Paraíba, João Pessoa, Brazil.

Maggi, Ruben, Maternal and Child Institute, Pernambuco, Recife, Brazil.

Mejía, Héctor, Children's Hospital, La Paz, Bolivia.

Merino, Marlene, Pediatrics and Childcare Institute Martagão Gesteira, Federal University of Rio de Janeiro, Brazil.

Mir, Ramón, Clinics Hospital, Asunción, Paraguay.

Mitchnik, Ana Lia, Anthropologist, Health Area VIII, Ministry of Health, Santa Fe, Argentina.

Montano, Alicia, Chief of the Medicine Chair, Faculty of Medicine, University of the Republic, Montevideo, Uruguay.

Motta, Sonia, Pediatrics and Childcare Institute Martagão Gesteira, Federal University of Rio de Janeiro, Brazil.

Motta, Vanda, Pediatrics Department, Faculty of Medicine, Federal University of Bahia, Salvador, Brazil.

Moulin, Zeina Soares, Pediatrics Department, Federal University of Minas Gerais, Belo Horizonte, Brazil.

Ordoñez, Gabriel, Carlos Andrade Marin Hospital, Ecuadorian Social Security Institute, Quito, Ecuador.

Penate Polanco, Jose Emilio, National Children's Hospital Benjamin Bloom, El Salvador.

Peña, Manuel, PAHO/WHO Representative, Peru.

Pinheiro, Francisco, Consultant on Dengue, Program on Transmittable Diseases, PAHO/WHO.

Pinto, Matilde, Economic Adviser, Program on Organization and Management of Health Systems and Services, PAHO/WHO, Washington, D.C., U.S.A.

Portela, Zuleica, Nutrition Consultant, PAHO/WHO, Brasilia, Brazil.

Riefkohl, Gloria, Preventive Medicine Division, Miami Children's Hospital, Miami, Florida, U.S.A.

Rios, Richard, Pediatrics Services, Clinical Hospital, Valdivia, Chile.

Rodríguez Cruz, Rodolfo, Consultant PAHO/WHO, Brasilia, Brazil.

Ruiz Merino, Roberto, Professor, National Institute of Children's Health, Lima, Perú.

Saráchaga, María Julia, Pereira Rossel Hospital. Montevideo, Uruguay.

Segura, Elsa, National Institute of Human Genetics, Ministry of Health, Buenos Aires, Argentina.

Simões, Celso Cardozo, Brazilian Institute of Geography and Statistics, Rio de Janeiro, Brazil.

Sosa, Aníbal, Alliance for the Prudent Use of Antibiotics (APUA), Boston, Massachussetts, U.S.A.

Sperotto, Giuseppe, Professor, Campinas University, São Paulo, Brazil.

Suriel, Oscar, National Consultant IMCI Program, PAHO/WHO, Santo Domingo, Dominican Republic.

Tavela, Susana Rosa, Pediatrician, Guadalupe West Health Center, Santa Fe, Argentina.

Terra, Viviane, Health Center, Medicine School, Sao Paulo University, Brazil.

Tirre, Regina, Pediatrics and Childcare Institute Martagão Gesteira, Federal University of Rio de Janeiro, Brazil.

Toro, Jorge, Department of Epidemiology, Ministry of Health, Santiago, Chile.

Tortori, Maria Marta Lima, Rio de Janeiro University, Brazil.

Valenzuela, Carmen, Consultant, IMCI Program, PAHO/WHO, Guatemala.

Wagener, Marta, Pediatrician-gastroenterologist, Orlando Alassia Children's Hospital, Minister of Health Santa Fe Provincial, Argentina.

Yadón, Zaida, Regional Adviser, Program on Transmittable Diseases. Pan American Institute for Food Protection and Zoonoses, Buenos Aires, Argentina.

Zegarra, Eduardo, Professor, Faculty of Medicine, Cochabamba, Bolivia.

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PART I
INTRODUCTION AND OBJECTIVES

Background

Acute respiratory infections, diarrhea, and malnutrition are three of the leading causes of death in children 1 week to 5 years of age in the majority of the developing countries, representing up to 70%, or 7 out of every 10 deaths. In many countries, these illnesses account for as many or even more deaths than perinatal problems. Together with other transmissible diseases, such as intestinal parasitic diseases, vaccine-preventable diseases, malaria, dengue, and tuberculosis, they are the leading cause of morbidity, and thus, of medical consultations and hospitalizations of children under 5 years in these countries.

Each year, thousands of children succumb to these illnesses, resulting in temporary or permanent damage to their overall health status. This group of illnesses has been recognized as the leading health problem of children after the first week of life, when the problems associated with birth no longer pose a threat to a child's survival.

Countries have made substantial progress in controlling several of these childhood illnesses. Poliomyelitis has been eliminated as a cause of illness, in the region of the Americas during the 1990s. The number of measles cases and attributable deaths has plummeted and transmission of the disease is being eliminated through immunization.

In some countries in the region of the Americas, there has been a sharp drop in cases and deaths from diarrhea. Mortality from pneumonia has also declined in several of these countries, although in lesser proportions.

In certain areas however, mortality from pneumonia has held steady, and mortality from diarrhea, while lower, is still responsible for a high proportion of deaths in children under 5.

The differences in mortality trends among the countries are attributable to factors that influence: (i) access to the available interventions for the detection, treatment and prevention of disease; (ii) the use that the population makes of these interventions; and (iii) family and community health practices.

Recognition of these disparities in the health status of children, as well as the factors that determine them, has led to the development of new interventions to reduce the gap that separates not only developed and developing countries but different population groups within a single country.

As part of this effort, the Pan American Health Organization/World Health Organization (PAHO/WHO) and the United Nations Children's Fund (UNICEF) devised Integrated Management of Childhood Illness (IMCI) as a single strategy for delivering effective health care to children in first level health services, as well as in the family and community.

IMCI is an effective strategy not only for assessing health status and the problems that affect children, but for selecting the most appropriate treatment and ensuring its effective application and follow-up. It is also effective for expanding the coverage of basic preventive measures, such as vaccination, improving family and community knowledge and practices related to care and treatment of children at home. Thus, the IMCI strategy contributes to an improvement not only in the

quality of care provided during the various episodes of disease that strike children, but the health care provided by the family and the community.

Making the benefits of this strategy available to all children under 5 years has thus become the primary objective for improving the general health status of children in all the countries and ensuring more equitable access by the population to the knowledge and interventions essential for preventing disease and death.

Implementing the IMCI strategy in the Region of the Americas has become a priority for increasing life expectancy and reducing gaps in child health among countries and population groups. Within this framework, PAHO/WHO has launched the *Healthy Children: Goal 2002* Initiative, which through universal implementation of the IMCI strategy, seeks to reduce the number of deaths in children under 5 years by 100,000 over 1998 figures—deaths attributable primarily to communicable diseases such as ARI and diarrhea. The countries of the Region have accepted this challenge and by striving to achieve this goal endeavor to improve the health status and survival of children in these countries.

Description of the Problem

In spite of prevention and control measures that currently exist, the persistence of illnesses and health problems have serious implications for survival and well being of children under 5 years. The consequences are premature and preventable deaths in thousands of children's each year, as well as temporary or permanent damage to their health, which impacts on the entire society. Controlling these problems requires continuous outlays of resources by families and the health services-resources that are often inefficiently used.

Mortality

Many of the deaths after the first week of life in children under 5 years each year (that is, deaths for the most part not associated with pregnancy and delivery) can be avoided through simple prevention measures, early diagnosis, and treatment.

- A large number of deaths from pneumonia can be prevented through the early detection of warning signs in the home, seeking for immediate assistance from the health services. Where staff should be trained to clinically assess, classify and treat the patient with appropriate antibiotics.

- Improving feeding practices can prevent many deaths from diarrhea. Education should focus primarily on exclusive breast-feeding during the first 4 to 6 months of life including proper weaning. Emphasis should be placed on preparation, preservation, and handling of food by improving basic sanitation for the population especially in ensuring safe water sources and proper excreta disposal and by improving personal and domestic hygiene.

- Early detection of symptoms by the family and prompt administration of fluids to prevent dehydration at home and the subsequent use of oral rehydration salts (ORS) to treat dehy-

dration at first-level health services can prevent additional deaths from diarrhea.

- Vaccination can prevent deaths from measles, whooping cough, diphtheria, tetanus, and tuberculosis meningitis.

- Deaths from malaria in children are preventable with early case detection and the administration of anti-malarial drugs, implementation of measures to prevent transmission such as mosquito netting and the elimination of the environmental conditions associated with the proliferation of the mosquitoes that transmit the disease.

- Deaths associated with malnutrition can be prevented if adequate feeding practices are adopted during the first 5 years of life. This includes exclusive breast-feeding during first 4 to 6 months, proper weaning practices, supplementary breast-feeding until the child reaches the age of 2 with adequate child nutrition, and the early detection of growth retardation and malnutrition.

Many children under 5 years and their families do not currently benefit from all these interventions for a variety of reasons:

- Lack of access to health services that can adequately treat childhood illnesses, whether due to the absence of services or health workers near the family residence, or the lack of trained personnel or resources to offer families measures for prevention, early diagnosis, and treatment.

- Delays in seeking medical assistance when the child is sick, due to the family's failure to recognize the early signs of severity in the child's condition, consultation with other types of health care providers, or the use of home remedies.

- Insufficient attention to the health status of the child in the health services, including inadequate clinical assessment, failure to detect the early signs and symptoms of illness, improper classification of diseases, and the use of ineffective or unnecessary treatments.

Morbidity

Many communicable diseases and nutritional problems can be prevented with simple methods.

- Vaccination, for example, can prevent measles, whooping cough, diphtheria, tetanus, tuberculosis meningitis.

- Exclusive breast-feeding during first 4 to 6 months of life lowers the incidence and severity of cases of diarrhea and other diseases associated with unhygienic food handling or feeding practices.

- Improvements in personal and domestic hygiene, the use of safe water, and sanitary excreta disposal prevent diarrhea and intestinal parasitic diseases.

A variety of measures can prevent serious morbidity from certain illnesses. For example:

- Breast-feeding prevents serious cases of acute respiratory infections, especially pneumonia.
- Adequate feeding practices help to reduce serious cases of infection by improving the body's immune response to the early stages of these diseases.
- Early administration of fluids when children have diarrhea prevents dehydration.
- The administration of micronutrients promotes growth and prevents deficiencies that lead to serious disorders. Vitamin A supplements decrease the prevalence of xerophthalmia and reduce the risk of serious diseases and mortality. Iron supplements eliminate hypoferric anemia, while iodine supplements prevent physical and cognitive developmental delays in children.
- Early treatment with antibiotics and other drugs (for example anti-malarials) prevents serious illnesses such as pneumonia, meningitis, septicemia, and cerebral malaria.
- Periodic dosing with parasiticides reduces the incidence of complications of intestinal parasitic diseases—for example, anemia and malnutrition.
- Effective measures are available to prevent vertical transmission of HIV from seropositive mothers to their infants. Some of these are treatments with AZT during pregnancy and childbirth and the use of breast-milk substitutes.

Quality of Care

Proper care of the child at home can help to improve the child's general health status, reduce the incidence of illnesses, and decrease the severity of the episodes that do occur, reducing the number of deaths from these causes. Adequate care in first-level health services contributes to rapid detection of the signs of illness, effective treatment and follow-up, preventive action, and the education of parents to improve their knowledge and practices when caring for the child at home.

At **home**, adequate care for the child includes:

- Exclusive breast-feeding during first 4 to 6 months of life and supplementary breast-feeding up to the age of 2 years, to help guarantee adequate growth and nutrition and boost the body's defenses against infections.
- Good eating habits including proper food handling, preparation and storage improve the child's nutritional status, prevent malnutrition, and boost its immune response to disease.
- Adherence to the vaccination schedule to guarantee that the child receives all the necessary vaccines in a timely manner, thus reducing the risk of contracting diseases.
- Healthy lifestyles, including personal and domestic hygiene, reduce the incidence of diarrhea and intestinal parasitic diseases; basic sanitation measures, to prevent the proliferation of vectors of diseases such as malaria and dengue (mosquitoes), or Chagas' disease (kissing bugs);

and the control of indoor air pollution to reduce the incidence and severity of episodes of acute respiratory infections.

- Knowledge and recognition of the early signs of illness in to promote timely visits to the health services or health workers.

- Utilization of competent health care providers to administer appropriate treatment.

- Discouraging the use of home remedies and non-prescribed drugs that may be detrimental to the child.

At **first-level health services**, proper care of the child includes:

- Assessing the child's general health status, regardless of the reason given by the parents for the consultation to enable early detection of signs and symptoms of underlying illness.

- Limiting the use of diagnostic technologies that are potentially harmful (x-rays, which expose the child to radiation) and/or expensive (other types of imaging, laboratory services).

- Discouraging the use of unnecessary drugs for treating the symptoms of diarrhea and acute respiratory infections (antidiarrheals, antitussives, expectorants, nasal decongestants), some of which may be harmful to the child.

- Avoiding unnecessary use of antibiotics, especially for diarrhea (without evidence of dysentery or cholera) or acute respiratory infections (without evidence of pneumonia, acute otitis media, or streptococcal pharyngitis), since these drugs do not contribute to an improvement in child's condition and in fact can promote bacterial resistance and increase the cost of care without benefit to the patient.

- Verifying the child's vaccination status, administering the necessary vaccines, and assessing the child's overall nutritional status.

- Educating parents on treating illnesses and detected health problems, as well as providing information on best practices in care, including measures for disease prevention and promotio of child and family health.

Progress in the Implementation of Prevention and Control Measures

For several decades now, many countries in the Americas have implemented many of the interventions necessary for reducing deaths and episodes of childhood illness and for improving care of the child in the home. These measures have played an important part in reducing the number of deaths from communicable diseases and malnutrition, which has in turn reduced total infant mortality. These interventions have helped to decrease episodes of disease, have contributed to the eradication of polio and have had major impact toward the elimination of measles transmission.

The countries have made serious efforts to offer health workers training and information about the recommended measures providing the necessary supplies, such as drugs, vaccines, syringes, and

other essentials. To a lesser extent, many countries have set up direct and indirect supervisory mechanisms to provide continuous support to health workers and the health services and to monitor the application of specific control strategies. Moreover, some countries have taken advantage of existing information systems or set up new mechanisms to monitor activities, assess outcomes, and conduct epidemiological surveillance.

The overall findings however, revealed disparities among the countries. In many areas only a very small percentage of the population has access to child health programs and are able to benefit from them.

Studies that evaluate implementation of the strategies for the control of diarrheal disease, for example, showed:

- The proportion of cases properly evaluated by trained health workers ranged from 6% to 70%.
- The proportion of diarrhea cases treated by trained staff who had received the proper indications for re-hydration ranged from 6% to 48%.
- Less than 15% of the parents of these children were given advice or counseled on how to care for the child at home.
- The proportion of cases of dysenteric diarrhea treated with antibiotics ranged from 5% to 64%.
- Studies to determine the degree to which the strategies for control of acute respiratory infections were implemented, yielded similar data:
- The proportion of identified pneumonia cases that were correctly evaluated and treated ranged from 10% to 42%.
- In at least 56% of the acute respiratory infection cases, antibiotics were unnecessarily prescribed.
- Less than 40% of parents were given advice or counseled on how to improve care of the child at home.

In both examples, the evaluation attempted to measure indicators of the impact of a specific strategy on case management for a single type of illness. In no case it evaluate the extent to which children with diarrhea or acute respiratory infections were also examined for the presence of other signs and symptoms of illness.

Studies in the mid-1990s revealed that in 10% to 20% of consultations with primary health care personnel, the child's vaccination history was not confirmed, and opportunities for vaccination were consequently missed. Although the percentages were far lower than those observed in the late 1980s, when missed opportunities were as high as 50%, many children do not benefit from preventive measures in a timely manner.

The IMCI strategy includes recommendations on care for the most frequent childhood illnesses and, systematic linkage of this care with disease prevention and health promotion activities. The IMCI strategy was welcomed by health service administrators as an adequate response for first level health services, the family, and the community to the above-mentioned health children's problems.

The IMCI strategy makes it possible to integrate the management activities of different programs such as, training and supervising health workers, ensuring a steady flow of supplies, monitoring effective implementation of the strategy, and determining whether goals and objectives have been met. The strategy also permits integration of educational contents on disease prevention and health promotion for children while serving as a starting point for detecting and assessing other health problems in the family.

Description of the IMCI Strategy

The IMCI strategy consists of a systematic series of measures and procedures aimed at health promotion, disease prevention, and the diagnosis and treatment of the illnesses and health problems that affects children's less than 5 years (Table 1).

Integrated Management of the Sick Child

Using the IMCI strategy for clinical management of the sick child has the following advantages:

a) By focusing from the outset on rapid detection and treatment of the illnesses and health problems that affect children and threaten their lives, the IMCI strategy makes it possible to deal immediately with the main problem that has caused the child to be taken to the health service. Thus, it responds to the main concerns of the population with respect to children's health

b) The thorough evaluation of health status of the child as part of IMCI permits the detection of other illnesses and health problems, even though they are not the main reason for consultation. Thus, it guarantees early detection and proper management of childhood illnesses that is often untreated because they go undetected by health workers.

Table 1. Measures Applied by Health Workers When Implementing the IMCI Strategy to Deliver Health Care to Children

Diagnosis and Treatment
• Rapid assessment of nonspecific signs in serious illness (convulsions, somnolence, difficulty swallowing), whose presence calls for referral to a hospital • Sequential assessment of signs and symptoms of the most prevalent illnesses to classify the problem and administer specific treatment: • Cough or difficult breathing • Diarrhea • Fever • Sore throat • Earache • Other signs of common illnesses (based on the local epidemiological situation) • Assessment of nutritional status • Assessment of vaccination status
Prevention
• Administration of vaccines • Administration of vitamin A
Health Promotion
• Education and support to promote adequate breast-feeding techniques • Education and support to promote an adequate diet for children • Education on general measures to care for the child at home • Education on the warning signs that should lead parents to take the child immediately to the health services

Strengthening Application of Preventive Measures

The IMCI strategy includes systematic assessment of child's vaccination and nutritional status, as well as activities to promote disease prevention and decrease the prevalence of malnutrition. This integrated approach helps to reduce missed opportunities for detection and treatment of problems while systematically incorporating preventive interventions.

Fostering Health Promotion Activities

IMCI includes specific educational components on how to care for the child at home, how to prevent disease and how to recognize early danger signs. This helps to improve the population's knowledge, attitudes, and practices to improve child health. The strategy thus becomes a vehicle for strengthening the family's capacity to care for the child at home.

Objectives to be achieved with the IMCI Strategy

The IMCI strategy is designed to achieve the following **epidemiological objectives:**

- Reduce mortality in children under 5 years, especially from infectious diseases such as pneumonia, diarrhea, malaria, dengue, tuberculosis, meningitis, septicemia, measles and other vaccine-preventable diseases, as well as mortality from nutritional disorders.

- Reduce the incidence of illnesses such as measles and other vaccine-preventable diseases, diarrhea, intestinal parasitic diseases, malaria, dengue, tuberculosis, and malnutrition.

- Reduce the incidence of serious cases of transmissible diseases such as pneumonia, diarrhea, malaria, and tuberculosis and malnutrition.

To meet these epidemiological objectives, the program must meet the following **strategic objectives:**

- Reduce the hospital case-fatality rate from respiratory infections, diarrhea, and malaria, since cases that require hospitalization will be detected earlier and will be less serious.

- Improve the knowledge of mothers and other caretakers, teaching them to recognize the danger signs of disease in order to seek care outside home.

- Reduce the frequency of serious cases among children under 5 years taken to the health services by their mothers or other caretakers.

- Reduce the number of hospital discharges for pneumonia, diarrhea, malaria, and malnutrition by decreasing the number of serious cases and increasing the resolution of cases seen at the first level of care.

- Reduce referral of ARI, diarrhea, and malaria cases that can be treated adequately at first level health services.

- Modify the number and distribution of diagnoses in primary care health services and hospitalizations of children under 5 years by reducing the case incidence of preventable illness.

- Reduce the unnecessary use of diagnostic technologies (diagnostic imaging and laboratory services).

- Reduce the unnecessary use of antibiotics for the management of ARI and diarrhea cases that don't require their use.

- Eliminate the use of ineffective and/or harmful drugs for the treatment of ARI and diarrhea, such as cough syrups, expectorants, and antidiarrheals.

Activities to Meet the Objectives

To meet these objectives, **access and utilization targets** must be accomplished: the entire population should have access to health personnel and health services that correctly apply the IMCI strategy and should follow the recommendations of the IMCI strategy on caring for the child at home, either healthy or sick.

As part of the implementation process, it has been recommended to established a gradual system that will permit the work to be carried out in a geographical sequence, selecting areas with the highest levels of infant mortality as the initial targets. This will help reduce rapidly the serious harm caused by these health problems while strengthening proper implementation of the strategy for its future expansion.

Since IMCI was developed as a generic strategy by PAHO/WHO and UNICEF, its contents must initially be adapted to guarantee that the most prevalent childhood illnesses and health problems in a country or region are addressed. This activity must also consider the most appropriate treatments, the site where the strategy will be applied, and the adaptation of communications strategies to ensure messages are accessible and understandable to the user population.

Implementation of the adapted IMCI strategy involves three components: access, utilization, and management control.

- The **access component** is designed to upgrade health systems so that they offer quality care. The management activities that make up the access component are:

  – **Training** of health workers to provide information, knowledge, and skills necessary to correctly apply the IMCI strategy; to improve the organization of the health services, and to strengthen educational and mass communication activities in the health services in coordination with other agencies and community representatives.

  – Providing the necessary **supplies** to execute all the technical and management activities of the strategy.

  – Periodic **supervision** of the staff trained, to discover the problems they face in implementing the strategy and devising appropriate solutions.

- The **utilization component** is designed to improve family and community practices that affect children's health. The management activity in this component is communication (which also involves the concepts of information and education).

  – **Communication** to improve the population's knowledge, attitudes, and practices about caring for children at home, to foster disease prevention and promote child health; and to ensure early detection of the signs of illness and immediate consultation at the health services.

- The **management control component** includes three activities: monitoring, evaluation, and epidemiological surveillance.

  – The purpose of **monitoring** is to continuously verify whether activities in the areas of training, supplies, supervision, and communication are being carried out as programmed and whether the health services meet the standards set by the IMCI strategy for the identification, classification, and management of cases; disease prevention; and health promotion. Monitoring attempts to identify problems as they arise in order to take immediate steps to solve them.

  – **Evaluation** determines whether the programming goals of access and utilization, as well as the strategic objectives, are being met. Evaluations are conducted at regular intervals—monthly for some activities, at least annually for others.

  – **Epidemiological surveillance** reveals the trends in mortality and morbidity indicators and whether the respective epidemiological objectives are being met.

    To monitor and evaluate the achievement of goals and objectives, different types of indicators are necessary. In selecting these indicators, the possibility of obtaining the necessary data for their measurement should be considered, as should their sensitivity and specificity for defining the changes to be measured.

    PAHO/WHO has developed a series of basic monitoring and evaluation indicators that make it possible to measure the extent to which program management goals have been met. For example the level of training achieved and the regularity of adequate supplies for the implementation of the strategy, as well as achievement of the access and utilization goals. Other indicators show whether epidemiological objectives with respect to morbidity and mortality have been met.

    The proposed indicators have been selected from an extensive set of results that can be obtained with the implementation of the IMCI strategy. In order to avoid working with a large number of indicators, which complicates the monitoring and evaluation process, a limited number have been chosen. This does not imply that many other indicators could not also be used to demonstrate the positive impact of implementing the strategy in terms of:

    - Less damage to children's health.

    - Better quality of care and appropriate case referral by health workers at the three levels of services.

- Greater participation by non-physician health personnel, including community health workers and pharmacists, in the diagnosis and management of ARI, diarrhea, and malaria cases, as indicated by the adapted strategy.

Epidemiological and Operations Research on the IMCI Strategy

This document presents a number of research proposals for inclusion in the regular activities of the IMCI program. These studies are useful for improving knowledge about the health problems that affect children, for tracking their evolution through application of the IMCI strategy, and for identifying the problems that hinder implementation of the strategy. Thus, it can be determined how useful the strategy is for improving the health conditions of children, and to what extent the program's implementation can be improved.

The protocols for conducting these different types of studies were prepared for use in the health services. Protocols should be selected according to the need for the proposed studies and their relevance to each health service, as well as the epidemiological profile of patient consultations, the level of complexity, the problem-solving capacity, and the possibilities of referral.

The protocols are presented simply as models and should be modified and adapted to the interests of the individuals responsible for the study and the circumstances of the location in which they will be applied, whether in the health services or in the community. In certain cases, applying the protocols will require the use of some of the statistical tools described in Part II, Statistical Methodology Support Module. This Module provides the theoretical underpinnings for certain aspects of the research related to the number of observations that will have to be made and the criteria for analyzing the results.

The purpose of the tools provided in the Statistical Methodology Support Module is to guarantee the quality of the research findings. In some cases it may not be possible to fully comply with all elements dictated by the scientific method, but this should not deter investigators from continuing to observe and analyze all aspects of the strategy's implementation and evaluating the results. Making mistakes is part of the research process. Any mistakes that are made can serve as the foundation for new research.

PART II
STATISTICAL METHODOLOGY SUPPORT MODULE

Introduction

The protocols for conducting operations research to measure the effectiveness of the IMCI strategy require the use of tools drawn from the scientific method. It is important to note that the decision to conduct certain of these studies entails a commitment to the effort and a desire for improvement that should in no way be discouraged. The search for knowledge is an *ongoing* process, and the tools provided here seek to orient that process so that the research is conducted properly and to help identify methodological aspects that were not correctly followed for reasons beyond the control of the person responsible for the study. In such cases, the analysis should be accompanied by the appropriate caveats, but the work that has been done should not be discarded. Instead of final conclusions, elements can be used to improve or draft other hypotheses for a new study, thus encouraging ongoing improvement in the quality of the effort.

This module provides the theoretical underpinnings of the research related to the **observations** that must be made and the **analysis** that is to be conducted on the basis of these observations. The theoretical underpinnings are based on elements of statistical methodology, adapted to allow for common-sense reasoning. A theoretical classification is provided, since not all the proposed studies will require the same conceptual underpinnings.

The elements of statistical theory required for each study will depend on the study's proposed objective. Depending on the objectives sought, there are three types of study:

- **Studies to compare the situation before and after implementation of the IMCI strategy**. This is "comparative research" on aspects related to the care provided at health facilities and the outcomes sought in the health of children under 5. Such research is directly associated with the evaluation of the implementation of the IMCI strategy and constitutes operations research in its own right.

- **Studies to estimate** the frequency and distribution of prevalent pathologies in children, or to obtain a description of the knowledge, beliefs, and practices of mothers and families, or to determine the frequency of practices such as vaccination and breast-feeding.

- **Studies to measure the correlation** between the health conditions of children under 5 and characteristics of the child, the mother, and the environment.

Estimates and correlation studies are necessary to adapt the operational aspects of the IMCI strategy. Their replication after the strategy has been adapted to incorporate the knowledge gained from the first iteration will assist in evaluating the effectiveness of IMCI.

In both cases, it is necessary to establish criteria to determine how many observations must be made and the criteria for analyzing the data thus obtained.

Studies to Compare the Situation Before and After Implementation of the IMCI Strategy

Comparisons between two periods of study assume that there have been no changes, other than the intervention whose effects one wishes to evaluate: in this case the effect of implementing the

IMCI strategy. Any outside factor that might have influenced the results could invalidate the comparison.

There are two very important issues in conducting the study:

- The number of observations to be made before and after implementation of the strategy, that is, the **sample size.**

- **How to analyze** the data obtained through observations, in order to determine whether implementation of the strategy has indeed produced changes.

The conceptual underpinnings for addressing these two issues are provided below.

Sample Size

The "sample" refers to the elements of the **universe of the research population** that will be observed, and from which the information necessary to analyze and secure the results proposed in the research objectives will be obtained.

Each protocol defines the population under study. This consists of the group of people or events that are to be studied. It is very important to define this correctly, since the conclusions will be based on the samples and may be applied only to the initially identified populations. If, for example, the focus of the study is the frequency of diarrhea cases in primary health care consultations during summer months, obviously, the conclusions of the study cannot be applied to consultations that occur during the winter.

Deciding the sample size determines **how many observations will be conducted.** For this type of study, there will always be two samples, corresponding to the periods before and after implementation of the strategy. This number depends on several factors, which are summarized as follows.

First Factor

What exactly does the study want to answer? Does it involve a measurement that will be expressed by a number? For example: weight in kg, height in cm; or does it involve observing a quality or a characteristic? For example: progress of a disease, classified as good or poor; nutritional status, classified as eutrophic or dystrophic (even if the classification is based on a numerical measurement).

In the first example, (studying each child, mother, event) the study question is a characteristic expressed by a **number.** In the second example, the study question is a **quality** that is expressed with a category (qualitative category).

Each child, mother, event, or element constitutes the **observation unit**, known as the sampling unit. The observation units will be characterized for cases where what is observable is a quality (nutrition, classification, severity). These are qualitative categories, and only those that can be broken down into two alternatives (nourished or malnourished, classified or unclassified, serious or non-serious) will be considered. The **indicators** proposed for each study will be based on the number of cases registered in one or the other alternative of the condition studied.

Example: $\frac{\text{Number of malnourished children seen in the health services}}{\text{Number of children seen in the health services}}$

The indicators may be multiplied by 100 in order to state them as percentages or proportions; such cases are symbolized with a letter "p".

Example: $\frac{\text{Number of malnourished children seen in the health services x 100}}{\text{Number of children seen in the health services}}$

In brief, it is necessary to determine what is to be observed in each sampling unit and how one intends to summarize the information collected in order to characterize the set.

Second Factor

How frequently does the event being studied occur? Based on the example above: the question would be: how many malnourished children are seen in the health services? This can also be expressed by asking: what is the magnitude of the indicator chosen? If the event involves something frequent, it can be detected on the basis of a few observations of child consultations; on the other hand, if it is something quite rare it will be necessary to observe a large number of consultations in order to identify malnourished children.

Closely related to the above is the fact that there needs to be an estimate of how much the problem will diminish by implementing the IMCI strategy, since the same sample size will be utilized after the strategy is implemented in order to analyze whether any changes have taken place[1].

Several factors are considered with regard to the **anticipated change**. Can the analysis be broken down into two parts: was there favorable, or positive, change? The response can be **Yes** or **No.** If there were changes, how much changed? The analysis has been broken down into two parts because these encompass the logical concerns of the party conducting the study; however, the available statistical tools may not always answer these two questions. The samples may represent different estimates of the population under study and this estimate will depend on the sample size. To the extent that it is indispensable to answer the two questions raised, it will be necessary to increase the sample size but usually the time and resources to do so will be lacking, and it will be necessary to ask the investigator whether he is interested in finding whether there was any change, regardless of how small, or if he wants to know whether the desired improvement was at least in the order of 20%. This was addressed above in the question on the change being sought.

It is appropriate to note that if the study is designed to detect **a change of at least 20%,** and the final analysis concludes that this did not happen, this DOES NOT MEAN that there was NO

1 The hypothesis test proposed for verifying difference or equality between two populations is based on a binomial distribution approximating the Gauss curve. If the null hypothesis of equality between the two proportions is true, the distribution of the differences between the proportions (deriving from successive pairs of samples) will be distributed binomially, and for samples larger than 20 will approach the Gauss curve, with a median equal to zero. This is proven algebraically when n1=n2 because it allows a common factor to be found. When the samples are not equal the distribution of possible differences becomes asymmetrical but can still be used keeping the approximation in mind, when the differences are not greater than about 10%.

CHANGE AT ALL. The sample was prepared to detect changes of 20% or more; if they are less than that, it is possible that the study will not detect them.

In conclusion, the sample size is related to the change sought with regard to the implementation of the IMCI strategy.

Third Factor

The findings of a study based on one or more samples are subject to the **probability** that—due purely to chance—the samples selected do not accurately represent the population under study, even if the design of the study and its execution were both correct. This could give rise to errors in the conclusions.

An example of such an error could be to conclude that an improvement occurred when there actually was none; this type of error is called **Type I Error.** It could also be concluded that there was no change, when there was actually a positive change in the situation studied; this type of error is called **Type II Error.** Such errors cannot be totally eliminated, but they can be reduced if the sample size can be increased. Accordingly, the probability of error that will be acceptable in the study findings needs to be specified.

It is appropriate to clarify that in addition to the sample size, the way in which the sample is selected is very important and should be specified in the appropriate protocols.

Below is an example of the three factors proposed. Let us assume that one wants to study **the increase in correct classification of pneumonia.**

In order to satisfy the first factor, the formula on which to base the analysis will be:

$$\frac{\text{Number of correct classifications of pneumonia} \times 100}{\text{Total number of classifications of pneumonia}}$$

In order to satisfy the second factor, it is necessary to have some information (even if only approximate) on what the initial value is, and on the desired increase. Let us assume that initially 40% of the classifications are correct and that this is expected to increase to 60%. This is expressed by saying that it is estimated that p1=40 and that it is expected that p2=60.

As for the third factor, it is necessary to decide the acceptable probability of error for each type.

Type I Error - Conclude that there were changes when in fact there were none

Type II Error - Conclude that there were no changes when in fact there were changes.

Generally, acceptable values for the probability of committing a **Type I Error** range between 0.01 and 0.05 (these may also be expressed as 1% and 5%). This type of error is symbolized with the Greek letter a and is interpreted as follows: when drawing conclusions, there is a 1% to 5% probability that a Type I Error will be made; in other words, a conclusion that there were changes when actually there were none, and that, by chance, the sample selected did not accurately reflect reality.

With regard to Type II Errors, the acceptable values for the probability of error ranges from 0.10 to 0.20 (as in the previous case, this can also be expressed as 10% and 20%). This type of error is symbolized with the Greek letter b and is interpreted as follows: when drawing conclusions, there is 10% to 20% probability that a Type II Error has been made: i.e., a conclusion that there were no changes when in fact there were changes. Just as with the Type I Error, this can happen purely due to chance.

In brief, the chosen indicator is the ratio of correct classifications of pneumonia compared to total classifications of pneumonia. The estimated initial value is approximately 40%, and it is expected that by implementing the strategy, it will increase to 60%. A Type I Error of a= 0.05, and a Type II Error of b= 0.20 will be acceptable. Looking in the Table in Annex II.B, find the box where column 0.40 (same as 40%) intersects with row 0.60 (same as 60%). That box reads "76", the size of each sample chosen to represent a population to study—-in this case *the classification of pneumonia in children of a given age.*

In order to generalize the search based on the table in Annex II.B, it should be clarified that in the columns for the p1 values, it will always be necessary to find the lowest possible value for the indicator, and in the rows for the p2 values, the highest, regardless of the order of the pertinent sample.

In our example we anticipated that implementation of the strategy would increase the value of the indicator. In other cases, however, the expected benefit might be posited as a decline in the proposed indicator.

Caution: some books or articles sometimes represent a with a Latin letter "p" which can be confusing since the Latin letter "p" also symbolizes the indicator.

Since there will be an initial sample prior to implementation, and another sample later on, after implementation, the samples will be called:

n_1 the first sample

n_2 the second sample

Whenever possible, an effort will be made for $n_1 = n_2$; in this case =76.

Attention should be drawn to the objectives that are set. In the matter being studied, for example, one may wish to differentiate by age groups, for example:

- Classification of pneumonia in children under 2 months
- Classification of pneumonia in children between 2 and 12 months
- Classification of pneumonia in children aged 12 months to 5 years

In this case, it should be noted that 76 is the minimum sample size that may be established; i.e. at least 76 observations need to be collected in the least frequent age group, in this case children less than 2 months of age. This constraint might mean that in principle, only children under 5 will be studied, followed by subgroups within that age group.

Decision-Making –Hypothesis Test

These tests are calculations to be conducted with the indicators obtained. Depending on the result obtained, it will be determined whether implementation of the strategy led to changes or not, taking into account that the conclusions are accompanied by a probability of error.

By way of example, the hypothesis test works as follows. Suppose the incorrect classification of pneumonia cases before and after implementation of the IMCI strategy yielded the following:

- **Before** 40% (Proportion of pneumonia classified correctly for hospitalization)
- **After** 41.5% (Proportion of pneumonias classified correctly for hospitalization)

Without further consideration we could conclude that —-for now—- there have been no changes in what is being evaluated and it will be necessary to continue training.

On the contrary, if the observed results were:

- **Before** 40%
- **After** 77%

There would no be need to resort to any statistical calculation in order to conclude with sufficient confidence that the situation has improved.

If the results indicate that the situation has deteriorated

- **Before** 40%
- **After** 28%

In such cases the implementation of the strategy should be reviewed. If there were no apparent deficiencies, the way in which the study was conducted should be reviewed. Based on the observations, corrections will be made in the implementation of the strategy or the information system, or the study of the later stage will be repeated.

But what about the decision to take if the results obtained were:

- **Before** 40%
- **After** 45%

Considering that the information was obtained on the basis of “samples”, can there be certainty that there has been a positive change? Or is the observation due to chance? It is necessary to consider that even if the strategy had never been implemented, some changes might be registered over time, purely due to chance, and do not necessarily reflect the truth of what usually occurs.

The hypothesis test yields the probability that the variation observed is due to chance.

In addition to the statement above, —-given the sample size calculated—- a variation might have been expected that was different from what was in fact observed.

If the probability that this is due to chance is high, it could be concluded that the strategy did not actually produce changes; but if on the contrary it is small, it might be said that the IMCI strategy introduced beneficial changes in the aspects being evaluated. The question thus arises: When is the probability high? or (the other side of the coin) when is it low? Where is the limit? This limit is usually set at 5%, that is, the value of a that was established for calculating the sample sizes. When the result is 5% or more, it is to be determined that the difference was due to chance. When the result is less than 5%, it is concluded that the difference is not random, but rather there is a high probability it is due to the IMCI strategy.

It should be quite clear that statistics are a helpful tool, but that, above all, the assumptions of the investigator should be respected—-not to change the results, but to proceed with due caution when the hypothesis test suggests a conclusion that differs from what was expected.

When the results of the hypothesis test approach the limit for acceptance or rejection, in this case 5%, and the conclusion clearly differs from the researcher's assumptions, it is recommended that the process be repeated and the steps that were followed reviewed.

Once the results have been obtained, the necessary indicators will be calculated and inserted into the following formula:

$$z = \frac{p_1 - p_2}{\sqrt{\frac{p_1 \times q_1}{n_1} + \frac{p_2 \times q_2}{n_2}}}$$

The hypothesis test described by this formula is known as the "normal distribution test".

Where:

p_1 = proportion of the fact t being studied prior to implementation of the IMCI strategy

q_1 = $1–p_1$ (Known as the p_1 complement).

p_2 = proportion of the fact being studied after the implementation of the strategy.

q_2 = $1–p_2$ (Known as the p_2 complement).

n_1 = Size of the sample prior to the strategy.

n_2 = Size of the sample after the strategy.

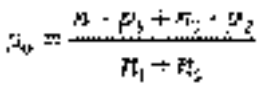
If the result of "z" is greater than $|1.64|$[2], it means that the probability of the difference being due to chance is less than 5%; accordingly, it will be concluded that the findings are not due to chance and there has been a change due to the implementation of the strategy.

2 Putting a number between bars means that only its absolute value and not its sign should be taken into account.

If the result is less than |1.64| it means that the probability that what is observed is due to chance is greater than 5%. It can thus be concluded that chance, rather than implementation of the strategy, may have produced the difference.

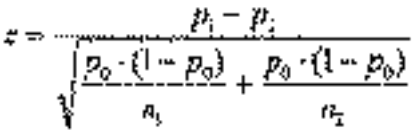
If the result is equal to |1.64| or very close to this value, it is advisable to expand the study with more observations, even though these might reflect only the period following the implementation.

A slight modification should be noted that will always improve the results. This modification consists in replacing the p_1 and p_2 values in the denominator of the equation (only in the denominator), with a common value that is the average of the two. It is advisable to pay close attention when averaging ratios; generally, it must always be done as follows:



A weighted average has been made. If the samples are of equal size it will not be necessary to do the weighting, and a simple average will suffice.

The resolution formula then will be as follows:



Example No 1:
Let us assume that the purpose is to reduce the number of hospitalizations for pneumonia in children under 1. To this end the following data are collected:

$n_1 = 30$

$$p_1 = \frac{\text{number of children < 1 year admitted with pneumonia}}{\text{number of children < 1 year with pneumonia (Before the strategy)}} = 0.45$$

(The indicator can be utilized without multiplying x 100)

The strategy is then implemented and the information is collected again:

$n_2 = 30$ (number of children under 1 with pneumonia)

$$p_2 = \frac{\text{number of children < 1 year admitted with pneumonia}}{\text{number of children < 1 year with pneumonia (After the strategy)}} = 0.40$$

The data are replaced in the previously noted formula and the result is calculated.

$$p_0 = \frac{30 \cdot 0{,}45 + 30 \cdot 0{,}40}{30 + 30} = 0{,}425 \qquad z = \frac{0{,}45 - 0{,}40}{\sqrt{\frac{0{,}425 \times 0{,}575}{30} + \frac{0{,}425 \times 0{,}575}{30}}} = 0{,}391$$

Since this value (0.391) is less than 1.64 it is concluded that the difference in hospitalizations of children under 1 with pneumonia might be due to random causes, which means that it is not certain that it is due to the IMCI strategy.

Example No. 2:
Let us assume that the purpose is to increase the degree of information that first-time mothers have on the care of newborns in the first month of life. To this end the following data are collected through a survey:

$n_1 = 38$ (number of mothers surveyed)

$$P_1 = \frac{\text{No. of first-time mothers with correct information on care of newborns in first month of life}}{\text{Number of first-time mothers surveyed (Before the strategy)}} = 0.15$$

The IMCI strategy is then implemented (theoretical/practical course on the care of newborns) and the information is again collected:

$n_2 = 40$

$$P_2 = \frac{\text{No. of first-time mothers with correct information on care of newborns in first month of life}}{\text{Number of first-time mothers surveyed (Before the strategy)}} = 0.43$$

The data are inserted in the formula provided and the result is calculated.

$$p_0 = \frac{38 \cdot 0{,}15 + 40 \cdot 0{,}43}{38 + 40} = 0{,}415 \qquad z = \frac{0{,}15 - 0{,}43}{\sqrt{\frac{0{,}415 \times 0{,}585}{38} + \frac{0{,}415 \times 0{,}585}{40}}} = -2{,}54$$

Since this value (-2.54) has a greater **absolute value** than 1.64 it is concluded that the differences detected, in terms of the increase in the amount of information possessed by first-time mothers on care of newborns in the first months of life, are not due to random causes, and, thus, given the objective and design of the study, it is concluded that this is due to the theoretical/practical course offered on the care of newborns.

Estimate Studies

The objective of **Estimate Studies** is to estimate the frequency of pathologies prevalent in children under 5, or of other characteristics such as vaccination status. This also includes studies to discover the duration of breast-feeding or to identify the knowledge of mothers with regard to the health of their children.

Studies can be conducted in the population that uses the specified health service being evaluated, or in the population residing within the health services catchment area. In either case, special care should be taken in drawing conclusions, since what is valid for the population seeking assistance may not be as valid for that general population.

In studies that estimate a characteristic of the general population, the methodology used for selecting the sample is particularly important and will in turn be influenced by size. The research may terminate with an estimate, or it may be necessary to complement it with other studies following the implementation of the strategy in order to evaluate changes[3].

The methodological factors inherent in this type of research (both with regard to the sample and analysis of the data) include elements related to the selection of the sample from the general population.

Two aspects of this research methodology diverge from what was said with regard to the comparative studies (before and after implementing an intervention):

- First, they work with a single sample, which is used as the basis for an estimate.

- Second, instead of a hypothesis test to evaluate a change produced by the strategy, it is necessary to calculate a confidence interval, which will contain the actual value of what is being estimated. A confidence level of 95% is established for such efforts.

Given a single sample, the considerations noted on the first and second factors to determine the size of the sample in the comparative studies (before and after implementing an intervention) remain valid. On the other hand, the considerations for the third factor are no longer valid; instead, the confidence interval mentioned in the above paragraph should be calculated.

In brief, the sample size in this type of estimate study will depend on some condition of the characteristic or variable under study: for example, the vaccination status of children, which is a qualitative variable, whose alternatives are designated as *with complete series of vaccination*, YES or NO. Also, there should be a rough idea of the proportion of children vaccinated; after all, a study should not arise out of total ignorance of what is being investigated. When one designs a study with a hypothesis or assumption about what is happening, the study usually serves to validate (or invalidate) the hypothesis. When no prior assumptions have been made, an exploratory or pilot study can be conducted in a small sample, usually between 10 and 20.

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3 When there are no reliable baseline data to estimate the prevalence of a variable, it is not possible to design comparative research (between the situation before and after implementation of the IMCI strategy). However, two separate estimates of the prevalence of the variable with its confidence interval (resulting from an estimate study), can be legitimately compared and allow for a conclusion with regard to the hypothesis of equality or difference, depending on whether the confidence intervals overlap or not.

The sample size will depend on:

- Type of variable under study, in this case qualitative, with two alternatives: vaccinated or unvaccinated (in this module we will work with this type of variable).
- Approximate frequency of what is to be studied.
- A satisfactory confidence level for the results obtained; confidence interval of the estimator, and probability of error.
- Method by which the sample is to be chosen (this will be clarified in an example).

Simple Random Sampling

Simple random sampling is when the sample selection is conducted in a single stage, that is, when the sampling units are selected directly. In these cases the sample size is calculated with the formula:

$$N = \frac{2^2 \times p.q}{d^2}$$

p = proportion of the fact studied

q = 1 – p

d = is related to the concept of the "confidence interval", since the estimator obtained from the sample should be accompanied by an interval, whose upper and lower limit we can be reasonably sure bracket the true value of the universe, given a defined probability of error.

This result requires no correction.

For the sample to be simple and random, there should be a list of all units comprising the population to be studied. The units will be numbered correlatively based on this list, and then, using a lotto ball tumbler containing all numbers corresponding to the population units (for example, children under 5 residing in a locality), as many numbers will be taken out at random as indicated by the size of the sample. A random numbers table may also be used that has been specially constructed and tested to ensure that the numbers appear in entirely random order. Once the numbers have been obtained, the sample will consist of units whose numbers coincide with those extracted from the tumbler or the random numbers table.

The selection can also be conducted systematically, that is, selecting units by skipping every *n* number of units. If the selection is, for instance, to obtain clinical histories, and it has been determined that the sample will be of 50 histories, proceed as follows: first, the total number of clinical histories comprising the population to study should be known, for example 1,000. This number will be divided by the sample size, that is, 1,000/50=20. The result of the division is called the

sample ranking and requires that one out of every 20 histories be selected. It is also necessary to determine the base point, i.e. the history to start counting from. This is done by randomly selecting a number between 1 and 20, and beginning with that number, selecting every 20th history until the full sample of 50 histories has been assembled.

If the population under study consists of mothers or children who seek assistance in the health services, the assumption is made that visits to the services are determined by chance, so that the visits of one or more days might comprise a sample, depending on the size needed. This would be valid for studying the frequency of pathologies. However, if what is sought is knowledge about mothers' opinions, the selection of mothers must be done in a way that will ensure that what a selected mother says is not overheard by the next mother.

Once the sample has been selected and the observations made, the indicators on which the study was designed are calculated. Each indicator calculated on the basis of a sample will be an estimate of the fact to be ascertained.

If comparisons are made, the hypothesis test will be applied. If what is obtained is an estimate, without a comparative study, it should be accompanied by a confidence interval (CI). This interval is constructed by adding and subtracting the results of the following formula to the indicator calculated:

$$IC = \frac{2 \times \sqrt{p \cdot q}}{n}$$

It may thus be stated with a confidence level of 95% that the value being estimated is actually contained within this interval.

When the sampling units cannot be identified, **cluster sampling** should be utilized to select the sample. This methodology is explained in the example of Annex II.A on vaccination coverage in a population.

When the variable to study is, for example, the knowledge of mothers or their attitudes and practices with regard to caring for the child, there are additional considerations that should be taken into account.

As in the above cases, the study may be conducted among mothers who use the health service where the IMCI strategy is to be implemented, and also among the entire community within the health service's catchment area. In this case it is assumed that activities will be carried out throughout the community; or that mothers who use the service and receive the health information provided will act as multipliers of the educational effect among mothers who do not use it.

If the study is conducted in the community, a randomly-selected group of mothers should be interviewed. The following methodology is proposed for this. The group of selected mothers comprises the study sample. The study should be conducted before and after implementing aspects of the IMCI strategy related to the education of mothers in order to determine if there have been changes in the initial situation observed.

The preceding paragraph suggests, as something self-evident, that the initial situation can be improved. This implies that the person responsible for the study possesses his own information or information from studies on the most common knowledge and beliefs of the mothers in the community, on those which can be improved, and on the extent to which this can be achieved.

It is very important to point out that the sample of mothers interviewed after the educational activities have been carried out should not be the group interviewed initially. If they were the same, the results would not be valid, since the first interview might have influenced certain knowledge and beliefs, meaning that the changes would not have been the result of the educational activities being evaluated.

It is a good idea to review in depth the concepts of *knowledge of the initial situation* and *validity of the questionnaire.*

With regard to **knowledge of the initial situation**, the preceding paragraphs simplify the subject by mentioning whether the mothers *have or do not have knowledge.* It is necessary, however, to define what it means *to have knowledge.* Furthermore, the effort should continue to discover what their beliefs are, whether or not they agree with what is defined as "knowledge". For this, a pilot sample in a qualitative stage of the study may be prepared. At this stage, the interview with the mothers should make it possible to identify the different beliefs that coexist among them. Once this is determined a survey can be conducted to quantify the frequency with which each different belief occurs. Furthermore, knowledge of the community beliefs will provide the necessary elements for understanding whether or not there should be an intervention, and if so, what that intervention is.

The interviews to research qualitative aspects are conducted through casual conversations without a questionnaire and provide major input into the revision of the questionnaires proposed. This does not preclude first testing the final survey questionnaire (based on the frequency with which detected alternatives occur) in a *pilot* sample that could be part of the definitive study.

The possibility of finding different beliefs is a *variable under study;* in order to *measure it* the appropriate indicator must be constructed, which should also define what it means *to have knowledge.*

A professional involved in conducting the strategy interviews should always be in charge of conducting the pilot sample; this job should not be delegated to an interviewer outside the project. The criterion for recommendation are that a certain level of training and experience be required to judge the quality of the questionnaire and its ability to accurately capture what is being investigated. It will often be necessary to use turns of phrase characteristic to a specific locale, or other details to improve communication between the interviewer and the mother. It is also recommended that the interviewer be from the place where the survey is being conducted.

Each survey should differentiate between questions germane to the basic objective and questions included to address future interests of the researchers or the current interests of people not directly linked to the study. Questions directly related to the survey objective should receive special attention. The way the question is posed and the way the response is recorded should make it possible to obtain the knowledge desired. This constitutes the qualitative aspect of the study, and

proper performance of these tasks is directly linked with the training provided to the person conducting the survey; this should receive greater attention than the number of surveys included in the "pilot" study. This is the qualitative part of the study and complements the quantitative description that will be provided by the definitive sample.

The quantitative aspects obtained in the pilot sample will be taken into account in calculating the size of the definitive sample.

This type of study conducted in the community and not in the health services, requires a different procedure for selecting and determining the number of sampling elements or units— i.e., the mothers who will be interviewed. See the steps provided in the example on vaccination coverage in Annex II.A.

Correlation Studies

Some research involves the need to test the association or **correlation**—simultaneously, and for a single moment or period—between certain characteristics of the mothers or the family group and the health status of the child, or the characteristics of the care requested or provided at a health facility. An example is research that seeks to detect habits and family characteristics that effect the nutritional status of children. In this case the results obtained appear in a table with two rows and two columns (known as "2 x 2 tables") used to analyze associations of this type.

Children according to family characteristics	Number of malnourished children	Number of non-malnourished children	Total
Children whose families present characteristic A	18	12	30
Children whose families do not present characteristic A	25	35	60
Total	43	47	90

Before referring to the sample size, some considerations should be noted with regard to the analysis. The analysis of the data should conclude whether an association between the characteristic studied and the nutritional status of the children really does exist.

In order to conduct the analysis, as in previous cases, the question is asked, "what results could be expected, as most likely **had there not been** differences in the nutritional status of the children between the two groups studied?"

If there were no differences, it could be assumed that each group would have the same proportion of malnourished children and that that ratio between the **total** number of malnourished children (43) and the **total** number of children could be calculated (90).

This ratio, expressed as a percentage, is:

$$\frac{43}{90} \times 100 = 47.8\%$$

Using this value, we calculate 47.8% of 30 and of 60, and obtain the values of 14 and 29, which are called estimated values when there are no differences between the two groups of families.

Based on the above the table is constructed with the *observed* values and those which it is *estimated would be applicable if there were no correlation between malnutrition and the presence of characteristic A in the families.* It is important to consider at this time that some studies might posit the correlation between a characteristic of the child and the absence, rather than the presence, of a given condition in the family, the mother, or the environment.

	Number of malnoursihed children		Number of non-malnourshied children		Total
	Observed	Estimated	Observed	Estimated	
Children whose families present characteristic A	18	14	12	16	**30**
Children whose families do not present characteristics A	25	29	35	31	**60**
Total	**43**		**47**		**90**

Based on the numbers in the boxes, a formula is constructed which works as follows: if we were to register in the boxes all possible values that could randomly occur if there were no association, the possible results would have a distribution called χ^2. (Reference: Sidney, S. *Nonparametric Statistics for the Behavioural Sciences*. McGraw-Hill Book Company, 1956, page 44).

A formula is constructed which subtracts the estimate from what has been observed, squares it, and divides it by the estimate; the value thus obtained can be analyzed by applying the hypothesis test known as χ^2.

$$\chi^2 = \frac{(18-14)^2}{14} + \frac{(25-29)^2}{29} + \frac{(12-16)^2}{16} + \frac{(35-31)^2}{31} = 1.14 + 0.55 + 1 + 0.52 = 3.21$$

There is another, simpler, method of calculation, which can be done on a calculator, but the proposed formula makes it possible to work out the answer.

The result obtained is compared with the value of χ^2 in special tables, for a= 5% and 1 degree of freedom. The value in the table is 2.69.

The degrees of freedom are related to the number of columns and rows of the table, or to the number of alternatives the characteristics studied can display. With regard to the example being analyzed, malnutrition could be classified by differing degrees, in which case more columns would be necessary. The characteristic whose presence is studied in the families could also be present in a different degree. Here we shall consider only two possible alternatives for each characteristic being studied.

Continuing with our example, the degrees of freedom can also be determined by saying that, of the values that appear in the four cells of the table, one only may be modified freely; after one has been changed, the values of the others will be predetermined by the totals in the margins of the table; hence it follows that in 2x2 tables there is a single degree of freedom, and it is obtained by multiplying the number of columns minus one times the number of rows also minus one.

Since the calculated value (3.21) is greater than the reference value χ^2 (2.69), one can conclude that malnutrition in the children is related to the presence of characteristic A in families, because there is less than a 5% probability that χ^2 would yield 3.21 or more simply by chance if there were no association.

The hypothesis test to be applied refers to whether or not a correlation exists, but it does not quantify the intensity of any correlation. In some cases it may be necessary to quantify the degree of correlation; this is achieved by estimating it on the basis of a so-called *Odd Ratio.* In such cases, the study should be designed in a particular manner, by selecting children who present the problem under study, in this case malnutrition. Each malnourished child would be matched with a control child (that is, a non-malnourished child) with the same characteristics in terms of aspects that might influence malnutrition, except for the aspect that was symbolized generically in the example as characteristic A.

To calculate the *Odd ratio*, based on the example above, proceed as follows:

$$\textit{Odd ratio} = \frac{18 \times 35}{25 \times 12} = 2.1$$

The possible results can be: equal to, greater than, or less than 1. When equal to 1, it is assumed that there is no correlation. When greater than 1, as in this case, it means that the risk of malnutrition in the children of families that exhibit category A is higher than in those who do not exhibit it. When the value is less than one, it means that the correlation was the opposite of what was expected.

In order for the result to be interpreted in this manner, the table for presentation and calculation should be constructed so that the first column always shows the cases and the second, the controls; furthermore, the first row should display the aspect regarded as associated with the cases.

In order to know the degree of correlation it is necessary to increase the sample size, which in these cases will always be two—- the cases and the controls. For each case, one or more controls can be selected. For purposes of this presentation a single control will be selected for each case.

In calculating the sample size in this type of study, it will be necessary to have the following information:

- The value expected from the correlation, i.e. the value expected from the *Odd Ratio.* The initial assumption will be 3.
- The Type I Error, which will be set at 5% or 0.05.
- The Type II Error, which will be set at 20% or 0.20.

In addition to the above it will be necessary to have information on what part of the population has the characteristic whose correlation with the cases is being studied. In this example it would be, what is the proportion of children from families that exhibit category A in the entire population under study. It will be assumed that the proportion is 60%.

With these data, go to the table in Annex II.C, where it is demonstrated that the size of each sample (cases and controls) will be 92.

Instead of, or in addition to, the Type I and II Errors, one should note the breadth of the confidence interval required in estimating the Odd Ratio. This is noted however, it will not be pursued in this module.

ANNEX II.A

STUDY OF VACCINATION COVERAGE IN THE CITY OF SANTA FE

Background

The Expanded Program on Immunization, promoted by the Pan American Sanitary Bureau and adopted by the national and provincial authorities, has proposed recommendations that include surveys of immunization coverage. The purpose of these surveys is to:

- Confirm the quality of the registry system.
- Provide further information that cannot be provided accurately by the registry systems, and as a by-product.
- Facilitate bringing standardized protocols and guidelines for the health system closer to the community, and, in certain cases, identify behavioral guidelines and shortcomings in the primary health services that might affect immunization coverage.

The study was conducted in the city of Santa Fe, excluding the Alto Verde district due to problems caused by the floods that swept the area when the work was being programmed.

The survey scheme proposed by the Expanded Program on Immunization recommends conducting the study in an age cohort with amplitude of one year, in children who at the time of the survey are between 12 and 24 months old. Since the previous year registered an increase in cases of measles, which exceeded alarm thresholds, it was also decided to investigate coverage of the booster dose of the measles vaccine. For this reason, the study was to include children between the ages of 18 and 30 months, so that they would have had an opportunity to receive the measles vaccine booster. The information required registered the age at which the children had received their dose(s) of the respective vaccines, making it possible to establish coverage at lower ages.

General Objective of the Study

- Know the status of children's vaccination with the basic schedule proposed by the Immunization Program. (At the time and place in which this study was conducted, the basic schedule for children was: BCG at birth, Sabin vaccine, and Triple vaccine at 2, 4, and 6 months, and measles vaccine for 12- and 18-month olds).

Specific Objectives

In children between 18 and 30 months of age in the city of Santa Fe, excluding the district of Alto Verde, know the coverage of:

- Vaccination with BCG, Sabin vaccine, and Triple vaccine, at 6 months of age in accordance with the vaccination series;
- Vaccination with BCG, Sabin vaccine, Triple vaccine, and first dose of measles vaccine at age 1, without taking the strict schedule of administration into account;

- Vaccination with BCG, Sabin vaccine, Triple vaccine, and second dose of measles vaccine between age 18 and 30 months, without taking the strict schedule of administration into account.

Materials and Method

The study was conducted through a door-to-door survey of mothers of a sample of children included in the 18 to 30 month age group of the city of Santa Fe. In some cases, information provided by a grandmother, aunt, or informed adult was accepted.

Design of the Sample

The size and selection of the sample were conducted along lines generally consistent with the schedule proposed by the Expanded Program on Immunization.

The proportion of vaccinated children should be estimated for each vaccine. This is yielded by:

$$\frac{\text{Number of vaccinated children}}{\text{Number of investigated children}}$$

This ratio, in the sample, would yield the **estimator** of the true size of the universe (the entire city of Santa Fe).

The variable to be studied (vaccination status) is qualitative, and the alternatives to be found are two: "vaccinated" or "not vaccinated".

Taking the aforementioned aspects into account (qualitative variable, and two alternative variables), according to statistical methodology it can be said that the variable has a binomial distribution. The following formula was thus used to determine the size of the sample (n).

$$n = \frac{k^2 (p \times q)}{d^2}$$

k = a number obtained from the table of the normal curve, selected according to the probability of error introduced by the sampling that has been decided on. For a probability of error of 5% (i.e. a confidence level of 95%) the number corresponding to k is 1.96, which is usually rounded up to 2.

p = the expected proportion of vaccinated children

q = the proportion of unvaccinated children

If "p" and "q" are stated as percentages, then p + q = 100. It is possible that "p" and "q" will not be stated as percentages, in which case p + q = 1.

In order to calculate n in this type of study, it is recommended that "p and q" values of 50%, or 0.50 be assigned, since this maximizes the product appearing in the numerator of the formula (p x q), and the sample is increased in order to improve the estimate.

d = related to the concept of the "confidence interval", since the estimator obtained from the sample should be accompanied by an interval, whose upper and lower values bracket the true quantity of the universe, with a probability of error or a confidence level established upon electing k.

This type of study does not need very small intervals. The Expanded Program on Immunization recommends that d = 10%, recalling that it is not 10% of the value estimated, but 10% regardless of the assumption. If you are not working with percentages, it is equal to 0.10.

Inserting it in the formula yields:

$$n = \frac{2^2 (50 \times 50)}{10^2} = 100$$

The size of n thus calculated is valid for a simple random sample, i.e. in cases where "the child" can be selected directly and randomly from the universe. This however, was not possible, since it entailed having a list of all children 18 to 30 months old living in the city of Santa Fe and selecting them at random by using a lotto tumbler or a random numbers table. Instead, a random selection was conducted of "groups of dwellings", or "segments" constituting the smallest grouping (approximately 20 houses) defined for census purposes. Proceeding in this fashion means that a "cluster" sampling is being conducted. Children living within a single cluster will not contribute the same information to the sample as if they were randomly selected in different parts of the city. The contiguity of housing may in some cases influence the mothers' behavior, and, of course access to the services. The sample should thus be expanded. In this case it was done in standard fashion by multiplying the value of n obtained times an amplification factor established as equal to 2; in other word, doubling the sample:

$$100 \times 2 = 200 \text{ children}$$

Selection of the Sample

At this point it has been established that 200 children were to be selected and that in order to obtain these children the segments (i.e. clusters) were to be selected first.

It was previously noted that the estimator obtained as a function of the sample was made up of:

$$\frac{\text{Number of vaccinated children}}{\text{Number of investigated children}}$$

It is interesting to observe that in each house visited, the numerator is the datum to be investigated, but also the denominator; in other words, there is an estimator made up of a quotient in which both the numerator and the denominator are variables. This estimator is called the ratio, and in order for it to provide a sufficiently accurate estimate of reality, a minimum 30 clusters should be selected.

In short, it was recommended that 30 clusters be selected, and that 7 children be investigated in each one, yielding a sample of 210 children. The application of this general recommendation

might involve some adaptation, depending on the definition of the cluster and the density of the infant population to be investigated.

The Institute of Statistics and Censuses of the province of Santa Fe provided the list of fractions, circuits, and segments into which the city of Santa Fe is divided and the number of dwellings registered in the last census.

Meanwhile, the Institute based the estimate of the number of children in the city on births. It was considered inadvisable to use the birth data registered in the city because they indicated too high a birth rate. The datum of total population registered in the last census in the city of Santa Fe was requested and multiplied by an estimated crude birth rate of 1.7%. This yielded:

$$\frac{289{,}593 \text{ population} \times 1{,}7}{100} = 4{,}923 \text{ births}$$

Deaths were discounted from this group. Since the age group to be studied was children between 18 and 30 months, a mortality rate was applied to the number of births that was slightly higher than the infant mortality rate. A rate of 40 per 1,000 was utilized.

$$\frac{4{,}923 \times 40}{1000} = 197, \text{ rounding up to } 200 \text{ deaths}$$

Thus, 4,923 - 200 = 4,723 children

The number of segments registered in the last census was 3,669.

Thus 4,723 ÷ 3,669 segments = 1.3 children per segment.

Thus, if 30 segments were taken, 30 x 1.3 = 39 children, only 39 children would be obtained and the desired sample size (200) would not be obtained. The cluster was thus defined as a group made up of more than one segment. Since the operational resources to do so were available, it was decided to increase the number of clusters to be selected. In short, 50 clusters were selected, each made up of three segments:

- Each segment had 1.3 children
- 3 segments had 3.9 children
- If 50 clusters of 3 segments each were selected, 50 x 3.9 = 195 children

Since the 1980 population and a low birth rate were used, it was assumed that the number of children to be found would be higher than this initial estimate.

It was decided that the segments would be selected systematically, that is, each with a number to determine the segments. This meant that all sectors of the city were proportionally represented, making it possible to perform a “statistical stratification”.

In order to select the segments systematically, they were all numbered from 1 to 3,669. Since it was necessary to select 50 groups, it was divided:

$$3{,}669 \div 50 = 73.4$$

This indicated that one out of every 73 segments should be selected, plus the next two segments, in order to complete the group of three. In order to decide which would be the first one, a random number between 1 and 73 was selected, with 43 being drawn. This indicated that the segment assigned number 43 in the numeration, plus the next two, were selected as the first cluster to be visited. The second was determined as follows:

$$43 + 73 = 116$$

This indicated that the segment numbered 116 plus the next two made up the second cluster to be selected, and so on successively until 50 clusters were obtained.

The interviewer was to cover the entire segment or group of chosen segments. This has practical advantages over selecting larger clusters and randomly picking houses since it reduces the number of addresses the interviewer has to track down. It has also been proven that in marginal urban areas it is very difficult to define the idea of housing with any precision, which limits the possibility of drafting precise instructions for the interviewer.

Three types of forms were prepared to record the information:

a) Control of Field Work
b) Household Survey
c) Summary of the Data by Cluster.

Personnel

Nurses, health educators, hygiene visitors, statisticians, a health inspector, a physician and a biochemist joined in conducting the survey. The experience gained during the survey helped technical personnel make suggestions to improve the organization and serve as supervisors in subsequent studies of this type. Three working groups were comprised of available personnel, whose make-up and number rotated. However, in no case were there less than two persons per team.

Organization of Field Work

A 1:10,000 map of the Santa Fe was obtained and the groups of three chosen segments (each constituting a cluster) were plotted. The provincial Institute of Statistics and Censuses also provided a map for each segment targeted for visiting.

Meetings were held prior to the work to discuss Forms A and B, and to assign the work. At the start, a number of surveys were assigned to each team, to be conducted within approximately one week during normal business hours.

A review meeting was held at the end the week and information on the experience was shared. Participants were taught how to fill out the summary worksheets and given enough work for a two-week period. A second evaluation meeting was held; thereafter the team worked without formal meetings, coordinating only the delivery and receipt of work.

Duration of the Surveys

The work was completed between 24 March and 22 April 1983.

Data Processing

Each group of interviewers had to transfer the data registered in the Household Survey form to a summary worksheet. For each segment there was a summary worksheet; one could be utilized for each group of segments, i.e. for each cluster.

In accordance with the objectives of the study three types of summaries were done, one for each objective.

The partial summaries were forwarded to the Statistical Section, where the final summary was prepared by calculating the proportion of vaccinated children as a function of the different vaccines and the different ages, as detected in the sample, along with the confidence interval for each estimate.

Results Obtained

Below are the results obtained by objective. For each case, the estimates are accompanied by the confidence interval calculated on the basis of the recorded information (this does not necessarily have to correspond with what had been initially programmed). As previously determined, each interval has a confidence level of 95%.

The visits to the households of the 50 groups, made up of three segments each (i.e. the 50 selected clusters), found 216 children in the targeted age group (18 to 30 months). In other words, on average 1.44 children per segment were found. Based on the initial calculation, 1.3 children had been expected per segment, given the certainty that the calculation was slightly underestimated; this was verified and a satisfactory sample size was obtained.

Coverage data were calculated separately, based exclusively on vaccination cards in the mothers' possession or by the mother's statement if the card was missing. When the vaccine consisted of three doses, it was established that if at least two doses were registered on the card and the mother declared that the last one had been administered, it was considered certified.

ANNEX II.B
REQUIRED SAMPLE SIZE FOR COMPARISON OF TWO GROUPS
TO DETECT VARIATIONS BETWEEN P_1 AND P_2
ALPHA (α) = 0.05 BETA (β) = 0.20

P_2	P_1									
	0.05	0.10	0.15	0.20	0.25	0.30	0.35	0.40	0.45	0.50
0.10	334									
0.15	104	536								
0.20	55	154	711							
0.25	35	76	195	890						
0.30	25	46	93	230	984					
0.35	19	32	56	106	258	1084				
0.40	15	23	38	63	119	280	1158			
0.45	12	18	27	42	69	128	296	1208		
0.50	10	14	21	30	45	73	133	305	1232	
0.55	8	12	16	22	32	47	75	136	308	1232
0.60		10	13	17	24	33	48	76	136	305
0.65			11	14	18	24	33	48	75	133
0.70				11	14	18	24	33	47	73
0.75					11	14	18	24	32	45
0.80						11	14	17	22	30

ANNEX II.C
SAMPLE SIZE FOR CORRELATION STUDIES

PROPORTION OF THE POPULATION	ODD RATIO TO BE DETECTED						
	1.5	2.0	2.5	3.0	4.0	5.0	10.0
.10	1222	381	204	135	80	57	25
.20	718	232	128	87	54	40	20
.30	571	190	108	75	48	37	20
.40	521	179	104	74	49	38	23
.50	521	184	110	79	54	43	27
.60	565	205	125	92	63	51	33
.70	671	251	155	115	81	67	45
.80	915	350	220	166	119	99	68
.90	1689	661	422	322	235	197	140

PART III

STUDIES TO ASSESS THE IMPACT OF THE IMCI STRATEGY ON INFANT MORBIDITY AND MORTALITY

PROTOCOL 1

IMPACT OF THE IMCI STRATEGY ON THE PREVALENCE OF MALNUTRITION IN CHILDREN UNDER 5 SEEN IN THE HEALTH SERVICES

INTRODUCTION

Malnutrition is an important health problem in children of the developing countries. Although, in general malnutrition is not registered as the underlying cause of mortality, it is a primary associated cause in a variable proportion of the deaths of children under age 5.

As a rule, malnourished children have more frequent episodes of respiratory infections and diarrhea than well-nourished children. These episodes are more severe and longer-lasting, contributing to further deterioration in the nutritional status of the child. Malnutrition also influences children's psychomotor development and growth, making it a determining factor in future school performance.

Diet and illness determine the nutritional status of children. Diet is related to the availability of resources in the child's home and to cultural patterns that determine the feeding practices for children.

In many developing countries, malnutrition appears to be more the consequence of improper feeding practices than the result of a lack of food resources. The absence or short duration of breast-feeding, inappropriate weaning practices, and restrictions applying to certain foods all contribute to children not receiving the necessary nutrients.

Cultural beliefs about feeding children during an illness, which includes withholding or restricting foods in cases of diarrhea or respiratory infection, also contribute to a deterioration in nutritional status.

Counseling and education of mothers about child feeding and supplementation with certain minerals (iron) and vitamins (vitamin A) currently constitute the principal interventions for improving the nutritional situation of children.

The classification of malnutrition proposed for the IMCI strategy includes three categories:

- Severe Malnutrition: The child shows visible severe emaciation (marasmus) or edema in both feet (kwashiorkor and edematous malnutrition).

- Very Low Weight for Age (equivalent to moderate malnutrition): On the weight-for-age chart, the point where the line for the child's weight intersects the line for the child's age is below the lower curve, that is, the curve that represents a standard deviation "z" of –3. Very low weight for age is an approximate indicator of low weight for height.

- Low Weight for Age (equivalent to mild malnutrition): On the weight-for-age chart, the point

where the line for the child's weight intersects the line for the child's age is above the lower curve, that is, the curve that represents a standard deviation "z" of –3, but below the curve that represents a standard deviation "z" of –2.

The protocol should use the classification of malnutrition adopted by the IMCI country program, which can mean using different standard deviation limits than those proposed by the PAHO/WHO generic standards, or the measurement of weight for height.

The IMCI strategy also includes education on making the best use of the natural resources found in a given locality, on preparation of more nutritious food, and on dietary supplementation during illness. Implementation of the IMCI strategy in the health services and in the community represents an important contribution to improving the nutritional status of children.

OBJECTIVE

To determine the impact of implementation of the IMCI strategy on the prevalence of malnutrition in children under age 5 who have consultations at the health services.

METHODOLOGY

For measurement of the proposed objective, the prevalence of malnourished children under 5 who are brought to the health services for consultations should be observed before and after implementation of the IMCI strategy.

The prevalence of malnourished children is determined by the ratio between the number of children under 5 who consult the health services and who are classified as malnourished (Low Weight for Age, Very Low Weight for Age, and Severe Malnutrition), and the total number of consultations for any reason in this age group.

Effective implementation of the IMCI strategy implies that:

- Health workers are trained in the theoretical and practical content needed for implementation of the strategy, preferably by having taken a clinical course in IMCI.

- The health services have the necessary supplies to carry out the recommendations for clinical assessment and treatment of children.

- Health workers have the opportunity to analyze problems and difficulties and raise questions about correct implementation of the IMCI strategy by means of follow-up visits after training and periodic supervision, both direct and indirect.

- The community using the health services has access to educational activities, both individual (before, during, and after the consultation) and in groups (through talks, meetings, and similar activities).

- The trained health workers systematically carry out the steps established in the IMCI strategy for evaluation, classification, and treatment of children under 5, including the components calling for evaluation of the child's nutritional status and for counseling the mother on feeding practices.

Evaluating the nutritional status of the child should be standard practice in every pediatric consultation regardless of the reason for the visit. Otherwise, many of the children seen and identified in the Daily Consultations Registry at the service will not have their weights and ages recorded in the corresponding registry. If this is the case, the information obtained will correspond to only a fraction of the consultations. If the characteristics of this fraction differ from those of the entire group (with regard to age, sex, diagnosis, etc.), this can introduce bias into the conclusions. For example, if a nutritional evaluation is only done when health workers suspect some problem in this regard, the proportion of malnutrition cases recorded will be greater than the real proportion in the total number of consultations, and this will distort the view of the problem.

Proper implementation of the components related to nutrition is essential in order to be able to determine the impact of the IMCI strategy on the nutritional status of children under 5 who visit the health services. The benefits of the IMCI strategy for children's nutritional status can be increased by means of other interventions such as dietary supplementation provided through the health services or other institutions that work in the community.

In calculating the sample size and the observation period, one should take into account the dimensions of the problem before implementation of the strategy, or at the start of implementation, and the expected impact. Steps for calculating the sample size are described in Part II, Support Module for Statistical Methodology, in the section on research that compares situations before and after implementation of the IMCI strategy.

The information should be obtained from the following records:

- Daily patient log: to obtain information on the total number of consultations of children under 5.
- Growth Monitoring Record: to learn the nutritional classification.

Annex 1.A presents a model of a chart for collecting information from these registries in order to facilitate its later processing. For data processing, any computer program that allows preparation of a database can be used, such as Epi Info or a similar program. If manual processing is needed, there is an Information Consolidation Table in Annex 1.B.

Using this information, it is possible to calculate the prevalence of malnourished children among those who have consultations at the health services. Table 1.1 gives some examples of indicators for this study. In calculating these indicators, it will be necessary to discard those cases in which the child's nutritional status was not recorded. Thus the numbers in column 8 of the table in Annex 1.B (No Data on Nutritional Status) should be subtracted from the numbers in column 2 (Total Number of Children Studied). This subtraction produces the number that will be used as the denominator.

Finally, a hypothesis test should be carried out for the principal indicator in order to find out whether implementation of the strategy produced changes in consultations for malnutrition in children under 5. For calculation of this test, refer to the Support Module for Statistical Methodology in Part II.

At the same time, in order for changes in the nutritional status of children to be attributed only to

the IMCI strategy, it should be clear that there has been no other important change in local socioeconomic conditions during the study period that would benefit children (for example, installation of a factory resulting in the creation of jobs, etc.).

Steps for implementing the study

Once the sample size and the observation period have been determined, the following steps should be taken to collect and consolidate information from the health services.

- Review the Daily Patient Log at the health services to identify the children who had consultations during the selected period.

- Register the nutritional classification of each child from the Growth Monitoring Record. The child's age at the time of consultation should also be obtained from the record (or from the Daily Patient Log).

- The chart in Annex 1.A can be used to collect information from the registries mentioned above.

- Perform data processing manually or by computer.

- Calculate the indicators.

- Carry out the hypothesis test for the principal indicator.

Table 1.1

INDICATOR	NUMERATOR	DENOMINATOR
Proportion of all children under 5 studied who are classified as malnourished	Total number of malnourished children under 5	Total number of children studied who have data for nutritional classification
Proportion of children under 5 who are classified with severe malnutrition	Total number of children under 5 with severe malnutrition	Total number of children studied who have data for nutritional classification
Proportion of children aged 1 to 4 years studied who were classified as malnourished	Total number of children aged 1 to 4 years classified as malnourished	Number of children aged 1 to 4 years studied who have data for nutritional classification
Proportion of children with very low weight for age	Total number of children with very low weight for age	Total number of children studied who have weights registered
Proportion of children aged 2 to 11 months studied with low weight for age	Total number of children aged 2 to 11 months with low weight for age	Number of children aged 2 to 11 months studied who have weights registered
Proportion of all malnourished children with very low weight for age	Total number of children with very low weight for age	Number of malnourished children

If the proportion of cases without specification of treatment is very high (greater than 40%), the results of the study will be of little value.

ANNEX 1.A
IMPACT OF THE IMCI STRATEGY ON THE PREVALENCE OF MALNUTRITION IN CHILDREN UNDER 5

DATA COLLECTION CHART

Health Service: _____ Period/Year: _____

No.	SURNAME AND GIVEN NAMES	SEX	AGE	WEIGHT	CLASSIFICATION

Observations:

To complete the Data Collection Chart:

- Complete the upper part of the chart, writing the name of the health service and the period (week, month or months, and year) corresponding to the information to be registered.
- Select the Daily Patient Log corresponding to the period under study.
- Review the first Daily Patient Log to identify child under 5.
- Write the name, sex, and age of the child.
- Look for information in the Growth Monitoring record corresponding to that child. Complete the columns for weight and age. Note the child's nutritional classification as of the date of the consultation and complete column 6, recording whether the child is well-nourished, has low weight for age, has very low weight for age, or has severe malnutrition.
- If information on weight, age, or nutritional status cannot be found, enter "not available" (N/A).

ANNEX 1.B
IMPACT OF THE IMCI STRATEGY ON THE PREVALENCE OF MALNUTRITION IN CHILDREN UNDER 5

INFORMATION CONSOLIDATION TABLE

Health Service: _____ Period/Year: _____

AGE GROUP	TOTAL NUMBER OF CHILDREN STUDIED	WELL-NOURISHED	MALNOURISHED				NO DATA ON NUTRITIONAL STATUS
			TOTAL	LOW WEIGHT FOR AGE	VERY LOW WEIGHT FOR AGE	SEVERE MALNUTRITION	
TOTAL							
<2 MONTHS							
2 - 11 MONTHS							
1 TO 4 YEARS							

Observations:

To complete the Information Consolidation Table:

Complete the upper part of the table, writing the name of the health service and the period (week, month or months, and year) corresponding to the information to be tabulated.

Using the Data Collection Chart, observe the child's nutritional classification on the date of consultation.

If the child was well nourished, make a mark (|) in column 3 (**Well-Nourished**) of the row corresponding to the child's age group.

If the child was malnourished with low weight for age, make a mark (|) in column 5 (**Malnourished: Low Weight for Age**) of the row corresponding to the child's age group.

If the child was malnourished with very low weight for age, make a mark (|) in column 6 (**Malnourished: Very Low Weight for Age**) of the row corresponding to the child's age group.

If the child had severe malnutrition, make a mark (|) in column 7 (**Malnourished: Severe Malnutrition**) of the row corresponding to the child's age group.

If data on the child's nutritional status was not registered, make a mark (|) in column 8 (**No Data on Nutritional Status**) of the row corresponding to the child's age group.

Once the growth monitoring records of all the children who had consultations in the study period have been reviewed, count the number of marks (|) in each box of the table and note the number of each.

Add up the numbers in the boxes in columns 5, 6, and 7 of each row and note the result in the box in column 4 of the corresponding row **(Malnourished: Total).**

Add up the numbers in the boxes in columns 3, 4, and 8 and note the result in the box in column 2 of the corresponding row (**Total Number of Children Studied**).

Add up the numbers contained in all the boxes of each column in order to obtain the figures that correspond to row 1 (**Total**).

PROTOCOL 2

IMPACT OF THE IMCI STRATEGY ON THE NUTRITIONAL STATUS OF CHILDREN UNDER 5 WITH PERSISTENT DIARRHEA

INTRODUCTION

Persistent diarrhea is an episode of diarrhea that starts acutely and continues for 14 days or more. Approximately 10% of cases of acute diarrhea become persistent. This condition leads to deterioration in nutritional status and is associated with higher case-fatality rates.

Persistent diarrhea is above all a nutritional disease and occurs more frequently in children who are already malnourished. An episode of persistent diarrhea can last for 3 to 4 weeks or more and cause intense weight loss, leading rapidly to forms of severe malnutrition, such as marasmus.

Weight loss during persistent diarrhea is caused by various factors. Some are associated with the physiopathology of the disease (reduced absorption of nutrients due to changes in intestinal mucous membrane), and others with management of the disease by health workers and the mother (dietary restriction by fasting or by dilution of food).

A proper diet is the most important component in the treatment of persistent diarrhea. The objectives are to provide sufficient intake to facilitate the repair process of damaged intestinal mucous membrane and to improve nutritional status and immune response. Continued monitoring of the course of the diarrhea and of the child's nutritional status is necessary to confirm the success of treatment.

The Integrated Management of Childhood Illness strategy includes specific recommendations with regard to diet. Following these recommendations will help prevent malnutrition or keep it from becoming worse if the child is already malnourished. Effective implementation of the IMCI strategy, therefore, allows children with persistent diarrhea to experience faster healing and recover to their previous nutritional status.

OBJECTIVE

To determine the impact of implementing the recommendations for child feeding proposed by the IMCI strategy on the nutritional progress of children with persistent diarrhea.

METHODOLOGY

Measurement of the proposed objective should be accomplished by observing the proportion of cases of persistent diarrhea that are brought under control, and show an improvement in nutritional status as measured by weight gain, before and after implementation of the IMCI strategy.

The proportion of cases of malnourished children with persistent diarrhea is determined by the ratio between the number of children under 5 with persistent diarrhea who consult the health services and are classified as malnourished, and the total number of consultations for persistent diarrhea in this group. It is important to ensure that the same definition of persistent diarrhea is used before and after implementation of the IMCI strategy.

Effective implementation of the IMCI strategy implies that:

- Health workers are trained in the theoretical and practical content needed for implementation of the strategy, preferably by having taken a clinical course in IMCI.

- The health services have the necessary supplies to carry out the recommendations for clinical assessment and treatment of children.

- Health workers have the opportunity to analyze problems and difficulties and raise questions about correct implementation of the IMCI strategy by means of follow-up visits after training and periodic supervision, both direct and indirect.

- The community using the health services has access to educational activities, both individual (before, during, and after the consultation) and in groups (through talks, meetings, and similar activities).

- Health workers systematically carry out the component calling for evaluation of the child's nutritional status in all consultations for reevaluation and follow-up of persistent diarrhea, as well as counseling the mother on feeding practices in the initial consultation and in all follow-up consultations.

The target population for the study consists of children under 5 years of age with persistent diarrhea, defined as three watery stools per day for 14 days or more, who have consultations at the health services where the study is conducted.

In calculating the sample size and the observation period, one should take into account the dimensions of the problem before implementation of the strategy, or at the start of implementation, and the expected impact. Steps for calculating the sample size are described in Part II, Support Module for Statistical Methodology, in the section on research that compares situations before and after implementation of the IMCI strategy.

The information required for the study can be obtained from existing medical records in the health services selected, but depending on the condition of the records, some operational complications may be encountered in carrying out the study. In any case, it will be necessary to bring together information from the first consultation in which the case is classified as *persistent diarrhea*, and information from later consultations. With regard to the first consultation, the following information is needed:

- Age of the child
- Date of the consultation
- Diagnosis(es) or classification
- Nutritional status (weight)

The child's age and the date of the initial consultation are usually included in the Daily Patient Log . Age should be recorded in both months and years so that the group of young infants between 1 week and 2 months of age can be studied.

The diagnosis is usually noted by the physician in the medical record. It is important to ensure that cases of diarrhea are classified properly, in particular by recording when it is a case of *persistent* diarrhea. Children with both persistent diarrhea and severe malnutrition are not included in the study because they are not treated at home, but must be admitted to hospital as inpatients.

In general, information on the child's weight is registered not in the Daily Patient Log but in the medical records. Care should be taken to ensure that the weight is always registered in the first consultation, and that it is possible to locate the clinical histories of all children diagnosed with *persistent diarrhea* who had consultations at the health service during the study period.

With regard to reevaluation and follow-up consultations, information should be obtained on:

- The date when the child is seen for reevaluation and follow-up.
- Results from the reevaluation and follow-up consultation, particularly weight.

Since the data that will be processed requires comparing information from the consultation in which *persistent diarrhea* is first diagnosed and that from later consultations, some operational complications can arise, depending on the records used.

The easiest way to bring together the information is to review the clinical history of each case of *persistent diarrhea* that was diagnosed and treated before implementation of the IMCI strategy and each case after the strategy is implemented effectively. Given that the services do not always have this type of record and that the records do not always have all the data required for the study, the model chart presented in Annex 2.A can be used to carry out the study. The use of this chart is unnecessary if the data can be obtained from the clinical histories used in the health facilities.

For data processing, any computer program that allows preparation of a database can be used, such as Epi Info or a similar program. If manual processing is required, an Information Consolidation Table is included in Annex 2.B. Based on this information, one can calculate the indicators of nutritional progress in cases of persistent diarrhea. Table 2.1 presents some examples of indicators for this study.

In calculating some of the indicators below, those cases that did not return for a reevaluation and follow-up visit should be discarded. For this purpose, the totals recorded in row 3 of the Information Consolidation Table should be used as the denominator.

Indicators can be calculated for different age groups or can be disaggregated in greater detail to specify the nutritional status (whether it declined from normal to low weight or from low weight to very low weight; whether it stayed the same at low weight or very low weight; etc.).

In order to accomplish the study's objective, a hypothesis test should be carried out for the principal indicator to find out whether implementation of the strategy produced changes in the nutritional status of children under 5 who had consultations at the health services for persistent diarrhea. For calculation of this test, refer to the Support Module for Statistical Methodology in Part II.

Table 2.1

INDICATOR	NUMERATOR	DENOMINATOR
Proportion of cases of persistent diarrhea that returned for reevaluation and follow-up consultation and that showed improvement in nutritional status within 30 days	Number of cases of persistent diarrhea that improved (from low weight to normal weight, or from very low weight to low weight) within 30 days	Number of cases of persistent diarrhea that returned for reevaluation and follow-up consultation within 30 days
Proportion of cases of persistent diarrhea that returned for reevaluation and follow-up consultation	Number of cases of persistent diarrhea that returned for reevaluation and follow-up consultation	Total number of cases of persistent diarrhea
Proportion of cases of persistent diarrhea that returned for reevaluation and follow-up consultation and did not show improvement in nutritional status within 30 days	Number of cases of persistent diarrhea that remained the same + number of cases of persistent diarrhea that worsened within 30 days	Number of cases of persistent diarrhea that returned for reevaluation and follow-up consultation within 30 days
Proportion of cases of persistent diarrhea that remained the same after 60 days	Number of cases of persistent diarrhea that remained the same after 60 days	Number of cases of persistent diarrhea that returned for reevaluation and follow-up consultation within 60 days

If the proportion of cases that did not return for check-ups is very high (greater than 40%), the results of the study will be of little value.

Steps for carrying out the study

Once the sample size and the observation period have been determined, the following steps should be taken to collect and consolidate information from the health services.

- Review the Daily Patient Log at the health service to identify the children with persistent diarrhea who had consultations during the selected period.

- Find the Growth Monitoring Record for each of these children to learn the child's nutritional classification. The child's age at the time of the consultation should also be obtained from this registry (or from the Daily Consultations Registry).

- Find the clinical history for each child to learn the dates on which the child was required to return for reevaluation and follow-up consultation.

- The chart in Annex 2.A can be used to collect information from the registries mentioned above.

- In cases where the information is not available in the usual records, the chart in Annex 2.A will be used as the study registry, to be filled in at each consultation of a child with persistent diarrhea, including reevaluation and follow-up consultations.

- The chart can be prepared by the health workers who provide care in the health services, whenever they identify a child with *persistent diarrhea.* The charts can also be completed at the end of each day by reviewing the Daily Patient Log and identifying the children classified as having *persistent diarrhea.* (When it is done this way, one should make sure that the health workers in charge of the child's care always register the data to be filled in on the chart.)

- If the chart is filled in by the health workers who provide care, the charts should always be available during the hours that patients are served so that they can be retrieved whenever a child returns for a reevaluation and follow-up consultation.

- If the chart is completed at the end of each day, it is important to ensure that all the information needed to fill in the section of the chart on reevaluation and follow-up is noted in the registries in use. In this case, review all the charts at the end of the day and check in the treatment registries to see whether any child classified as having *persistent diarrhea* came in for a reevaluation and follow-up consultation.

- Process the data manually or by computer.

- Calculate the indicators.

- Carry out the hypothesis test for the principal indicator.

ANNEX 2.A
FOLLOW-UP ON NUTRITIONAL STATUS OF CHILDREN WITH PERSISTENT DIARRHEA

DATA COLLECTION CHART

Surname and Given Names: _____

Home Address: _____

DATE	AGE (in months)	WEIGHT	WEIGHT GAIN	NUTRITIONAL STATUS		
				NORMAL	LOW WEIGHT FOR AGE	VERY LOW WEIGHT FOR AGE
INITIAL CONSULTATION						
REEVALUATION AND FOLLOW-UP CONSULTATIONS						

Observations:

To complete the Data Collection Chart:

This form should be prepared for each case with a diagnosis of *persistent diarrhea* since these children will be given appointments for periodic check-ups.

Begin filling out the form as follows:

- Complete the upper part with the surname and given names of the child, the age in years and months, and the home address.

- In the row for the **Initial Consultation**, fill in the date when the child was diagnosed or classified as having *persistent diarrhea,* along with the child's age in months and the child's weight on that date.

- Using the growth curve in the Table of Procedures for the IMCI strategy (or a curve that may have been adopted for an adaptation of the strategy), classify the child's nutritional status as either *Normal* (does not have low weight for age), *Low Weight for Age*, or *Very Low Weight for Age.*

Proceed as follows in filling out the form for each **Reevaluation and Follow-Up Consultation**:

- In column 1 of the form, note the date when the child was seen for a reevaluation and follow-up consultation.

- In column 2, note the child's age in months at the time of the reevaluation and follow-up consultation.

- In column 3, note the child's weight at the reevaluation and follow-up consultation.

- Using the weight-for-age curve in the Table of Procedures for the IMCI strategy, mark an "x" in the column that corresponds to the nutritional status of the child: *Normal* (does not have low weight for age), *Low Weight for Age,* or *Very Low Weight for Age.*

ANNEX 2.B
NUTRITIONAL PROGRESS OF CASES OF PERSISTENT DIARRHEA IN CHILDREN UNDER 5

INFORMATION CONSOLIDATION TABLE

Health Service: _____ Period/Year: _____

Age Group:_____

CHECK-UPS	TOTAL	IMPROVED FROM		REMAINED THE SAME		WORSENED FROM	
		LOW WEIGHT TO NORMAL	VERY LOW WEIGHT TO LOW WEIGHT OR NORMAL WEIGHT	LOW WEIGHT	VERY LOW WIGHT	NORMAL WEIGHT TO NORMAL WEIGHT OR VERY LOW WEIGHT	LOW WEIGHT TO VERY LOW WIGHT
TOTAL DE CASOS DE DIARREA PERSISTENTE							
RETURNED FOR REEVALUATION AND FOLLOW-UP CONSULTATION WITHIN 30 DAYS							
RETURNED FOR REEVALUATION AND FOLLOW-UP CONSULTATION WITHIN 60 DAYS							
RETURNED FOR REEVALUATION AND FOLLOW-UP CONSULTATION WITHIN 90 DAYS							
DID NOT RETURN FOR REEVALUATION AND FOLLOW-UP CONSULTATION							

Observations:

To complete the Information Consolidation Table:

1. Complete the upper part of the table, writing the name of the health service, the period (week, month or months, and year), and the age group corresponding to the information to be tabulated.

2. Count the number of cases of *persistent diarrhea* identified during the study period. This number should equal the number of Data Collection Charts. Note the total number of cases of *persistent diarrhea* in column 2 (**Total**) of row 2 (**Total Cases of Persistent Diarrhea**) of the table.

3. Select the first Data Collection Chart for a child with *persistent diarrhea* and find the first reevaluation and follow-up consultation.

4. If the child was not brought in for any reevaluation and follow-up consultation, make a mark (|) in column 2 (**Total**) of the last row (**Did Not Return for Reevaluation and Follow-Up Consultation**) of the Information Consolidation Table.

5. If the child did return for a reevaluation and follow-up consultation, determine the nutritional classification based on the weight-for-age chart, using the child's weight and age on the day of the reevaluation and follow-up consultation.

6. If the child returned for a reevaluation and follow-up consultation, proceed as follows in the corresponding row (Within 30 days, Within 60 days, or Within 90 days):

    6.1. If the child's nutritional status as classified in the reevaluation and follow-up consultation improved (went from very low weight to low weight, or from low weight to normal weight), make a mark (|) in the column 3 or 4 of the consolidation table, respectively.
    6.2. If the child's nutritional status as classified in the reevaluation and follow-up consultation remained the same (as low weight or very low weight), make a mark (|) in column 5 or 6 of the consolidation table, respectively.
    6.3. If the child's nutritional status as classified in the reevaluation and follow-up consultation worsened (went from normal weight to low weight or very low weight, or from low weight to very low weight), make a mark (|) in column 7 or 8 of the consolidation table, respectively.

7. Once the review has been completed of the forms for all children with a diagnosis of *persistent diarrhea* who had consultations in the selected period, add up the number of marks (|) in each box of the table and write the resulting number in each box.

8. Add up the numbers in the boxes of columns 3 through 8 of each row and note the result in the box in column 2 (**Total**) of the corresponding row.

PROTOCOL 3

IMPACT OF THE IMCI STATEGY ON THE PREVALENCE OF PNEUMONIA WITH PLEURAL EFFUSION AMONG HOSPITALIZED CHILDREN

INTRODUCTION

In the majority of developing countries where high mortality from pneumonia still occurs, an elevated frequency of complicated pneumonias is also observed, with pleural effusion or pleuropulmonary suppuration being the most frequent complication. Pleural effusion is not common in the developed countries, as this complication is closely associated with delay in treating pneumonia with antibiotics.

Delayed treatment of pneumonia results from various causes, including failure by parents or other caregivers of children under 5 to recognize warning signs; lack of access to health services or trained health workers and lack of antibiotics recommended for treatment of pneumonia.

Implementation of the IMCI strategy can help to change this situation. It includes practical criteria for evaluation and classification of ARI cases at the first level of care, criteria that have a high predictive value for early detection of pneumonia in children under 5. The IMCI strategy also provides for the education of parents and other caregivers of children in order to improve their knowledge and ability to recognize early warning signs of disease. This reduces delays in seeking medical advice and, as a result, reduces the likelihood that the child's illness will deteriorate. .

Effective implementation of the IMCI strategy in health facilities considerably reduces the possibility that some danger sign or warning will be overlooked in evaluation of the child, and as a result, makes it possible to detect pneumonia cases in the early stages and administer antimicrobial treatment. This reduces the probability of the pneumonia becoming worse, with a consequent reduction in the number of cases requiring hospitalization and a still greater reduction in the occurrence of complications such as pleural effusion.

OBJECTIVE

To determine the impact of implementation of the IMCI strategy on the prevalence of pneumonia with pleural effusion in hospitals.

METHODOLOGY

For measurement of the proposed objective, the proportion of hospital discharges for pneumonia with pleural effusion as a share of all hospital discharges for pneumonia in children under 5 years of age should be observed, before and after implementation of the IMCI strategy.

The proportion of discharges for pneumonia with pleural effusion is determined by the ratio between the number of discharges for pneumonia with pleural effusion in children under 5 and the total number of discharges for pneumonia in that age group.

Effective implementation of the IMCI strategy means that health workers apply the criteria for evaluation, classification, and treatment proposed by PAHO/WHO, with whatever adaptations may have been made for the particular country.

The target population of the study consists of children under 5 years of age discharged for pneumonia from the hospitals where the research is conducted.

In calculating the sample size and the observation period, one should take into account the dimensions of the problem before implementation of the strategy, or at the start of implementation, and the expected impact. Steps for calculating the sample size are described in Part II, Support Module for Statistical Methodology, in the section on research that compares situations before and after implementation of the IMCI strategy.

Data for the study will be obtained from the discharge registry of the pediatric ward (or of the rooms corresponding to it, depending upon the hospital's structure), and should include the following information:

- Age of the child
- Date of discharge
- Diagnosis
- Cause of discharge

The date of discharge and the child's age are usually recorded in the discharge registries. Age should be recorded in both months and years so that the group of young infants between 1 week and 2 months of age can be studied.

The diagnosis is usually noted on discharge in the clinical history of the case. If different terms are used for a single pathology, some reference diagnoses should be selected for coding the information. The International Classification of Diseases diagnoses can be used for this purpose, or another way of grouping can be defined.

Special care should be taken to note in the clinical history the presence or absence of pleural effusion or pleuropulmonary suppuration, whether present at the time of admission or detected after the patient is hospitalized.

Information from the discharge registry should be tabulated to obtain data on the total number of discharges for pneumonia of children under 5 and the number of these with pleural effusion or

pleuropulmonary suppuration. This information should be obtained for the different age groups that are selected.

Data processing should be carried out in two different periods, both before and after the IMCI strategy is implemented in the health services making the referrals and in the admitting hospital, in order to confirm the expected reduction in the frequency of this complication.

It should be emphasized that any reduction will depend on effective implementation of the IMCI strategy in all, or the majority, of the health services that refer patients to that hospital. This means that the IMCI strategy should be implemented not only in the outpatient clinic and emergency room of the hospital but also in the health centers within the hospital's catchment area that use the hospital for case referral.

Annex 3.A presents a model Information Consolidation Table, followed by instructions for completing it.

Using this information, it is possible to calculate the indicators for pneumonia with pleural effusion in the different age groups, as a proportion of the total number of cases of pneumonia and as a proportion of total cases discharged from the hospital for any cause. Table 3.1 gives some examples of indicators for this study. Based on these examples, similar indicators can be formulated for any other diagnosis.

In order to accomplish the study's objective, a hypothesis test should be carried out for the principal indicator to find out whether implementation of the strategy produced changes in the number of hospital discharges for pneumonia with pleural effusion in children under 5. For calculation of this test, refer to the Support Module for Statistical Methodology in Part II.

Special considerations

In analyzing the results, one should take into account: the change in the proportion of cases of pneumonia with pleural effusion before and after implementation of the IMCI strategy; changes in the total number of hospitalizations of children under 5 and;the number of hospitalizations for pneumonia. This analysis should be done in order to confirm:

- That the reduction in the proportion of cases of pneumonia with pleural effusion is not due to an increase in the number of hospitalized cases of pneumonia (that is, the denominator of the indicator).

- That the reduction in the proportion of cases of pneumonia with pleural effusion is not due to an overall reduction in the number of children under 5 hospitalized for any cause.

To attribute the early detection of pneumonia as a factor in reducing the proportion of cases of pneumonia with pleural effusion, there must be measures to ensure the comparability of the cases of pneumonia, stratified by degree of severity, age group, and associated pathologies (for example, HIV infection, congenital malformations, severe malnutrition), both before and after the IMCI strategy is implemented.

Table 3.1

INDICATOR	NUMERATOR	DENOMINATOR
Proportion of cases of pneumonia with pleural effusion among all discharges for pneumonia in children under 5	Total number of discharges for pneumonia with pleural effusion in children under 5	Total number of discharges for pneumonia in children under 5
Proportion of cases of ARI among all hospital discharges of children under 5	Total number of discharges for ARI in children under 5	Total number of discharges for any cause in children under 5
Proportion of cases of pneumonia among all hospital discharges for ARI in children aged 1 to 4 years	Total number of discharges for pneumonia in children aged 1 to 4 years	Total number of discharges for ARI in children aged 1 to 4 years
Proportion of cases of pneumonia with pleural effusion among all discharges for pneumonia in children aged 6 to 11 months	Total number of discharges for pneumonia with pleural effusion in children aged 6 to 11 months	Total number of discharges for pneumonia in children aged 6 to 11 months

ANNEX 3.A
HOSPITAL DISCHARGES FOR PNEUMONIA WITH PLEURAL EFFUSION IN CHILDREN UNDER 5

INFORMATION CONSOLIDATION TABLE

Health Service: _____ Period/Year: _____

	CHILDREN UNDER 5 YEARS	UNDER 6 MONTHS	6 TO 11 MONTHS	1 TO 4 YEARS
TOTAL DISCHARGES FOR ANY CAUSE				
TOTAL DISCHARGES POR ARI				
TOTAL DISCHARGES FOR PNEUMONIA				
TOTAL DISCHARGES FOR PNEUMONIA WITH PLEURAL EFFUCION				

Observations:

To complete the Information Consolidation Table:

1. Complete the upper part of the table, writing the name of the hospital or ward to which the information corresponds, and the period (week, month or months, and year) that will be studied.

2. Select the Hospital Discharge Registry for the first day of the chosen period.

3. Review the Hospital Discharge Registry to find the first case of a child under 5 hospitalized in the selected period. Make a mark (|) in row 2 of the table (**Total Discharges for Any Cause**), selecting the column that corresponds to the age of the child.

4. If the diagnosis on discharge does not correspond to an ARI, continue as indicated in point 3.

5. If the diagnosis on discharge is an ARI (any pathology), make a mark (|) in row 2 of the table, in the column that corresponds to the age of the child.

6. If the ARI diagnosis is neither pneumonia nor pneumonia with pleural effusion, continue as indicated in point 3.

7. If the diagnosis on discharge is pneumonia or pneumonia with pleural effusion, make a mark (|) in row 4 of the table for pneumonia, or in row 5 of the table for pneumonia with pleural effusion. In either case, make the mark in the column that corresponds to the age of the child.

8. Once the review of the Hospital Discharge Registry has been completed for the entire period selected, count the total number of marks (|) in each box of the table and write the resulting number in each box.

9. Add up the numbers in all the boxes of each row to obtain the figures that correspond to column 2 (**Children Under 5 Years**).

PROTOCOL 4

IMPACT OF THE IMCI STRATEGY ON HOSPITAL CASE FATALITYFROM CHILDHOOD ILLNESS

INTRODUCTION

The high hospital case-fatality rates currently recorded in the hospitals of the developing countries are associated with the very severe condition of hospitalized cases. This is the result of delayed consultation and inadequate care of children in the home and in the first-level health services.

Delayed consultation results from a lack of adequate knowledge in the community about the danger signs of serious illnesses, such as pneumonia and diarrhea, and consequent failure to seek timely assistance from a health service or health provider. Given that ARI and diarrheal diseases are very common in children, they may experience several diarrheal episodes per year therefore, the mothers and families fail to recognize these occurrences as abnormal. Quite often malnutrition in a child is not perceived as a problem by the parents but rather as part of the child's general appearance. Other diseases such as malaria are often accompanied by fever and general signs of illness, which also fail to alarm people living in areas where the disease is endemic.

In many countries or in certain regions , the use of traditional remedies and treatments prescribed by lay health practitioners or endorsed by cultural tradition is very common. This results in delayed consultation with health services or health providers, which at times leads to progression of the disease. Some home remedies are actually detrimental to the child's condition.

In the routine operation of the health services in developing countries, mothers typically have to wait a long time to be seen; and when they are seen, children often cannot be evaluated properly due to lack of time or to inherent deficiencies in the physical structure of the services.

At times, treatment with antimicrobial and antimalarial drugs is not available in some services and the child cannot receive these drugs without going to the hospital.

These delays in seeking care and proper treatment and, when necessary, referral of the child to a higher-level health facility, stem as much from problems associated with the community as from problems in the health services. The resulting consequence is disease progression and increased case fatality.

Effective implementation of the IMCI strategy, including the establishment of effective criteria for evaluation and classification of disease, considerably reduces the possibility that some warning or danger sign will be overlooked in the evaluation.

The criteria selected for the classification of children allow health workers to identify those who really require immediate referral for hospital treatment, distinguishing them from those who can be treated as outpatients, either with specific drugs or with symptomatic measures.

The IMCI strategy includes counseling and educating the mother and other relatives to observe warning signs that indicate the need to consult the health services. Consultation will be carried out promptly and cases that require hospitalization will be detected early, with consequent improved prognosis.

Implementation of the IMCI strategy, therefore, will achieve a reduction in severe conditions requiring hospitalization and, as a result, will help to reduce hospital case fatality from childhood illnesses such as ARI, diarrhea, malaria, and malnutrition.

OBJECTIVE

To determine the impact of effective implementation of the IMCI strategy on hospital case fatality from childhood illnesses such as ARI, diarrhea, malaria, and malnutrition.

METHODOLOGY

For measurement of the proposed objective, the hospital case-fatality rate from prevalent childhood pathologies should be observed before and after implementation of the IMCI strategy, in one or more hospitals or their pediatric wards.

This case-fatality rate is determined by the ratio between in-hospital deaths from pathologies prevalent in children under 5 and the total number of hospitalizations for these pathologies in this age group.

Effective implementation of the IMCI strategy implies that:

- Health workers are trained in the theoretical and practical content needed for implementation of the strategy, preferably by having taken a clinical course in IMCI.

- The health services have the necessary supplies to carry out the recommendations for clinical assessment and treatment of children.

- Health workers have the opportunity to analyze problems and difficulties and raise questions about correct implementation of the IMCI strategy by means of follow-up visits after training and periodic supervision, both direct and indirect.

- The community using the health services has access to educational activities, both individual (before, during, and after the consultation) and in groups (through talks, meetings, and similar activities).

The target population for the study consists of children under 5 years of age whose diagnoses on hospital discharge are diseases targeted by the IMCI strategy in the hospitals where the research is conducted.

In calculating the sample size and the observation period, one should take into account the dimensions of the problem before implementation of the strategy, or at the start of implementation, and the expected impact. Steps for calculating the sample size are described in Part II, Support Module

for Statistical Methodology, in the section on research that compares situations before and after implementation of the IMCI strategy.

Data should be obtained from the discharge registry for the pediatric ward (or the rooms that correspond to it, depending on the hospital's structure), and should include the following information:

- Age of the child
- Sex
- Date of discharge
- Diagnosis
- Cause of discharge (medical discharge, voluntary discharge, transfer, death)

The discharge date and the child's sex and age are usually noted in the discharge registry. Age should be recorded in both months and years so that the group of young infants between 1 week and 2 months of age can be studied.

The diagnosis is usually noted at the time of discharge in the clinical history of the case. If different terms are used for a single pathology, reference diagnoses should be selected for coding the information. The International Classification of Diseases diagnoses can be used for this purpose, or another way of grouping can be defined.

In the analysis a distinction can be made between diagnoses of pneumonia, bronchitis, bronchiolitis, flu, other ARI, diarrhea with and without dehydration, dysentery, persistent diarrhea, malaria, severe malnutrition, etc., as well as between the different age groups. Finally, the cause of discharge is also recorded from the clinical history of the case.

If the aim is to analyze all cases of death, including deaths that did not occur in the hospital studied, information should also be obtained on the progress of cases transferred to other hospitals and on voluntary discharges.

Also, if the aim is to discriminate between in-hospital deaths of patients who had been hospitalized for more than 48 hours and deaths within the first 48 hours of hospitalization, duration of the hospital stay should also be calculated when carrying out the review of the Hospital Discharge Registry.

Information from the discharge registry should be tabulated to obtain data on the total number of discharges for ARI, diarrhea, malaria, etc., of children under 5, and the causes of the respective discharges. This information should be obtained for the different age groups selected.

Data processing should be carried out in two different periods, both before and after the IMCI strategy is implemented in the health services making the referrals and in the admitting hospital, in order to confirm the expected reduction in hospital case fatality from these causes.

It should be emphasized that any reduction in hospital case fatality will depend on effective implementation of the IMCI strategy in all, or the majority, of the health services that refer patients to that hospital. This means that the IMCI strategy should be implemented not only in the outpatient

clinic and emergency room of the hospital but also in the health centers within the hospital's catchment area that use the hospital for case referral.

Annex 4.A presents a model Data Collection Chart for compiling information from the registries to facilitate its later processing. Analysis of the results should take into account not only any change in the proportion of deaths from prevalent diseases before and after implementation of the IMCI strategy, but also any change in the total number of hospitalizations of children under 5, and in the number of hospitalizations for diseases targeted by IMCI.

This analysis should be carried out in order to exclude the possibilities:

- That the reduction in the proportion of deaths from prevalent diseases is due to an increase in the number of cases hospitalized for diseases that are targets of the IMCI strategy (that is, the denominator of the indicator).

- That the reduction in the proportion of deaths from prevalent diseases is due to an overall reduction in the number of children under 5 hospitalized for any cause.

Furthermore, for a reduction in hospital case fatality for diseases targeted by the IMCI program to be considered the result of their early detection, there must be measures to ensure the comparability of the cases, stratified by degree of severity, age group, and associated pathologies, before and after the IMCI strategy is implemented.

For data processing, any computer program that allows preparation of a database can be used, such as Epi Info or a similar program. If manual processing is needed, there is an Information Consolidation Table in Annex 4.B.

Using this information, one can calculate the indicators for the proportion of cases of childhood illness that died during hospitalization, either for all the diagnoses together or for each diagnosis studied. Table 4.1 sets out some examples of indicators for this study. Based on these examples, similar indicators can be formulated for any other diagnosis.

In all cases, the case-fatality rate should be calculated excluding voluntary discharges, since the outcomes of these are unknown (unless they are investigated by means of family visits). Also excluded are transfers to other facilities, since information will also be unavailable in these cases (unless it is compiled by the referral facilities).

One can also calculate indicators for the proportion of cases of pneumonia, diarrhea with dehydration, malnutrition, etc., among the total hospitalized cases of childhood illness.

To accomplish the study's objective, a hypothesis test should be carried out for the principal indicator to find out whether implementation of the strategy produced changes in hospital case fatality for the pathologies targeted by the IMCI strategy. For calculation of this test, refer to the Support Module for Statistical Methodology in Part II.

Table 4.1

INDICATOR	NUMERATOR	DENOMINATOR
Proportion of deaths among all hospital discharges for childhood illness in children under 5 years	Total number of deaths among hospital discharges for childhood illness in children under 5 years	Total number of discharges for childhood illness **minus** total number of discharges for childhood illness that were transferred **minus** total number of discharges for childhood illness that were voluntary discharges
Proportion of deaths among all hospital discharges for childhood illness in children under 2 months	Number of deaths among total discharges for childhood illness in children under 2 months	Total number of discharges for childhood illness in children under 2 months **minus** number of discharges for childhood illness in children under 2 months that were transferred **minus** number of discharges for childhood illness in children under 2 months that were voluntary discharges
Proportion of deaths among all discharges for pneumonia in children under 5 years	Number of deaths among total discharges for pneumonia in children under 5 years	Total number of discharges for pneumonia in children under 5 years **minus** number of discharges for pneumonia in children under 5 years that were transferred **minus** number of discharges for pneumonia in children under 5 years that were voluntary discharges
Proportion of deaths among all discharges for diarrhea with dehydration in children aged 2 to 11 months	Number of deaths among total discharges for diarrhea with dehydration in children aged 2 to 11 months	Total number of discharges for diarrhea with dehydration in children aged 2 to 11 months **minus** number of discharges for diarrhea with dehydration in children aged 2 to 11 months that were transferred **minus-** number of discharges for diarrhea with dehydration in children aged 2 to 11 months that were voluntary discharges

ANNEX 4.A
HOSPITAL CASE-FATALITY RATE FOR CHILDHOOD ILLNESSES

DATA COLLECTION CHART

Health Service: _____ Period/Year: _____

No.	SURNAME AND GIVEN NAMES	SEX	AGE	DATE OF DIS-CHARGE	DIAGNOSTIC	CAUSE OF DIS-CHARGE	HOSPITALIZATION TIME

Observations:

To complete the Data Collection Chart:

- Complete the upper part of the chart, writing the name of the health service and the period (week, month or months, and year) corresponding to the information to be registered.
- Select the Hospital Discharge Registry corresponding to the first day of the chosen period.
- Review the discharge registry to find the first case of a child under 5 hospitalized for childhood illness in the selected period.
- Note the data on the chart.
- Continue to record subsequent cases of children under 5 hospitalized for childhood illness during the study period.

ANNEXO 4.B
HOSPITAL CASE-FATALITY RATE FOR CHILDHOOD ILLNESSES

INFORMATION CONSOLIDATION TABLE

Health Service: _____ Period/Year: _____

Age Group: _____

	TOTAL	MEDICAL DISCHARGE	VOLUNTARY DISCHARGE	TRANSFER	DEATH
TOTAL DISCHARGES FOR CHILDHOOD ILLNESS PNEUMONIA					
PNEUMONIA					
BRONCHITIS					
BRONQUIOLITIS					
DIARRHEA WITH DEHYDRATION					
MALNUTRITION					
MALARIA					
OTHER					

Observations:

To complete the Information Consolidation Table:

1. Complete the upper part of the table, writing the name of the hospital or ward to which the information corresponds, the period (week, month or months, and year) that will be studied, and the age group to which the table corresponds (children under 2 months, from 2 to 11 months, from 1 to 4 years).

2. Using the Data Collection Chart, follow these steps:

   2.1. Identify the diagnosis at the time of discharge and select the corresponding row of the table. Then, make a mark (|) in column 2 (**Total Discharges**) of the selected row.

   2.1. Identify the cause of the discharge and proceed as follows:

   - If the cause was medical discharge, make a mark (|) in column 3 (**Medical Discharge**) of the row corresponding to the diagnosis of the case.

   - If the cause was voluntary discharge, make a mark (|) in column 4 (**Voluntary Discharge**).

   - If the cause was transfer to another health care facility (a higher-level hospital, for example), make a mark (|) in column 5 (**Transfer**).

   - Finally, if the cause of discharge was the patient's death, make a mark (|) in column 6 (**Death**).

3. Once the discharge registry corresponding to the entire selected period has been reviewed, add up the number of marks (|) in each box of the table and note the resulting number in each.

4. Add up the numbers in all the boxes of each column to obtain the figures that correspond to row 1 (**Total Discharges for Childhood Illness**).

PROTOCOL 5

IMPACT OF THE IMCI STRATEGY ON THE NUMBER OF DEATHS IN THE HOME DUE TO CHILDHOOD ILLNESS IN CHILDREN AGED 2 MONTHS TO 5 YEARS

INTRODUCTION

The persistence of high mortality from childhood illness (especially from pneumonia and diarrhea) in children under 5 in the developing countries can basically be attributed to the following:

- High prevalence of risk factors for illness and progression of disease, such as low birthweight; absence or short duration of breast-feeding; deficiencies in personal, domestic, and environmental hygiene; air pollution within homes; and inadequate feeding of children.

- Lack of access for most of the population, and especially of high-risk groups, to health services or health workers who can provide proper care during episodes of illness.

- Failure to use the health services, or delayed consultation when a child is sick; failure to carry out recommendations for care and treatment in the home before and during an illness; and inability to recognize danger signs that indicate the need to seek care outside the home for a child's illness.

The combination of these factors results in a greater number of severe cases of childhood illness, and in a greater number of deaths. Many sick children do not receive care from health workers, or receive late care, which is the reason that it is necessary to consider *deaths in the home.*

The number of deaths in the home from childhood illnesses (such as pneumonia, diarrhea, meningitis, and septicemia), and the proportion of total deaths from these causes in children under 5, are closely associated with access to the health services, with the patterns of health service use by the population, and with the population's knowledge about care and treatment of children before and during illness.

Implementation of the Integrated Management of Childhood Illness strategy can help to modify these factors, and thus can help to reduce total deaths from childhood illness as well as the number and proportion of them that take place without any care provided by health workers.

By including a substantial education component for mothers and other caregivers in the home, the IMCI strategy leads to improved knowledge in the community about how to care for children before and during illness. This will help reduce certain risk factors such as lack of vaccination and the absence or short duration of breast-feeding. The IMCI strategy includes measures for improving the feeding of children, and thus contributes to reducing malnutrition.

Implementation of the IMCI strategy helps to improve parents' knowledge of danger signs that indicate the need to seek an immediate consultation at the health services, thus encouraging early diagnosis and treatment of illness.

Finally, the IMCI strategy increases the problem-solving capacity of first-level health facilities and health workers, and improves the population's general access to medical care for children's health problems.

Effective implementation of the IMCI strategy in a specific area will thus help to reduce mortality from childhood illness, and in particular, to reduce the number of deaths that occur in the home without adequate treatment.

Efforts to determine the causes of child deaths in the home present important methodological difficulties when death certificates are not complete or are not reliable. In the general opinion of researchers who have worked on this problem, there are methods of retrospective study using duly validated verbal autopsy questionnaires that make it possible to determine with adequate reliability the number of deaths over the course of a year and to calculate the mortality. However, these methods cannot be used to determine the specific causes of death from diseases with acceptable reliability, and as a result, rates for specific causes of death cannot be established. Only deaths from accidents and deaths from disease can be clearly distinguished.

Verbal autopsy questionnaires are limited for a number of reasons, including the parents' inability to recognize key clinical signs and the difficulty remembering relevant factors several months after the event.

The majority of non-accidental deaths of children from 2 months to 5 years of age are due to childhood illnesses included in the IMCI strategy. In infants under 2 months the majority of deaths are due to prenatal and perinatal causes on which the IMCI strategy has very limited impact.

For this reason, the principal focus of this protocol is to measure the number of deaths in the home from disease in children between 2 months and 5 years. It will not attempt to determine the causes. The rate and proportion of deaths in the home from disease in this age group reflect the rates and proportion of deaths from childhood illnesses included in the IMCI strategy.

OBJECTIVE

To determine the impact of effective implementation of the IMCI strategy on the number and proportion of deaths in the home among all deaths of children from 2 months to 5 years of age, occurring in a given area.

METHODOLOGY

For measurement of the proposed objective, the number and proportion of deaths from disease occurring in the home should be observed before and after implementation of the IMCI strategy in a given geographic area.

Mortality in the home is determined by the ratio between deaths from disease in children aged 2 months to 5 years that occurred in the home and the total number of deaths in that age group in the area under study.

- Effective implementation of the IMCI strategy implies that:

- Health workers are trained in the theoretical and practical content needed for implementation of the strategy, preferably by having taken a clinical course in IMCI.

- The health services have the necessary supplies to carry out the recommendations for clinical assessment and treatment of children.

- Health workers have the opportunity to analyze problems and difficulties and raise questions about correct implementation of the IMCI strategy by means of follow-up visits after training and periodic supervision, both direct and indirect.

- The community using the health services has access to educational activities, both individual (before, during, and after the consultation) and in groups (through talks, meetings, and similar activities).

In calculating the sample size and the observation period, one should take into account the dimensions of the problem before implementation of the strategy, or at the start of implementation, and the expected impact. Steps for calculating the sample size are described in Part II, Support Module for Statistical Methodology, in the section on research that compares situations before and after implementation of the IMCI strategy.

The next step is to select a specific geographic area and the health services, in particular the referral hospitals, that provide health care to children under 5 living in the area.

One should obtain the total number of deaths of children aged 2 months to 5 years that occurred in the area in the specified period and differentiate them by the place where death occurred, whether the cause was disease or accident, and whether or not the child received treatment in a health facility or from health workers for the disease that led to the death.

The following data are needed for the study:

- Age of the child
- Cause of death: disease or accident
- Place where the death occurred: hospital, health center, home, etc.
- Whether or not the child received medical attention during the illness that led to the death
- The person responsible for the child in the home

This information may be acquired in various ways:

- If an efficient death registry, with limited underreporting, is available, information on the total number of deaths of children aged 2 months to 5 years, the cause of death, and the place where death occurred can be obtained by reviewing the death certificates entered in the Civil Registry.

- If the death registry has a high degree of underreporting (and underreporting will doubtless be greater precisely for those deaths that occur outside the health services, which are the focus of this study), other sources of information should be used, such as:

    - Registries of hospitals and health centers that covered the population of the selected area during the study period. A special effort should be made to identify all deaths corresponding to the study area. Some of these deaths may have occurred in other hospitals after patients were transferred by health services in the study area because of the severity of the case or for other reasons.

    - Various sources in the community that can give information about the deaths of children aged 2 months to 5 years during the study period. These sources may include church registries as well as interviews with community leaders or representatives, community health workers, traditional healers, and those responsible for cemeteries.

In order to learn the circumstances of these fatalities, an interview should be conducted with the person responsible for their care to determine whether the death was associated with disease or an accident.

Annex 5.A presents a model Data Collection Chart for compiling information on deaths registered in the civil registries and in records within the health services, in order to facilitate later processing.

In cases where the death was not registered, an interview will be carried out with an informant who helped to care for the child during the time of the illness that led to the child's death. Annex 5.B presents a model Survey Chart for obtaining this information.

For data processing, any computer program that allows preparation of a database can be used, such as Epi Info or a similar program. If manual processing is needed, there is an Information Consolidation Table in Annex 5.C.

This information can be used to calculate various indicators concerning the proportion of deaths of children in each age group that occurred in the home and that were caused by childhood illnesses. Table 5.1 presents some examples of indicators for this study.

Table 5.1

INDICATOR	NUMERATOR	DENOMINATOR
Proportion of deaths from disease in children aged 2 months to 5 years that occurred in the home	Number of deaths from disease in children aged 2 months to 5 years that occurred in the home	Total number of deaths in children aged 2 months to 5 years that occurred in the area
Proportion of deaths from any cause in children aged 2 months to 5 years that occurred in the home	Number of deaths from any cause in children aged 2 months to 5 years that occurred in the home	Total number of deaths from any cause in children aged 2 months to 5 years that occurred in the area
Proportion of deaths from disease in children aged 2 to 11 months that occurred in the home	Number of deaths from disease in children aged 2 to 11 months that occurred in the home	Total number of deaths in children aged 2 to 11 months that occurred in the area

In order to accomplish the study's objective, a hypothesis test should be carried out for the principal indicator in order to find out whether implementation of the strategy produced changes in the proportion of deaths from disease that occurred in the home. For calculation of this test, refer to the Support Module for Statistical Methodology in Part II.

ANNEX 5.A
PROPORTION OF DEATHS FROM DISEASE THAT OCCURRED IN THE HOME IN CHILDREN AGED 2 MONTHS TO 5 YEARS

DATA COLLECTION CHART

Civil Registry or Health Service:_____

Period/Year: _____

No.	SURNAME AND GIVEN NAMES	SEX	AGE	CAUSE OF DEATH	PLACE OF DEATH	PERSON RESPONSIBLE FORTHE CHILD	MEDICALN CARE

Observaciones:

To complete the Data Collection Chart:

- Complete the upper part of the chart, noting the civil registry used or the name of the health service, and the period (week, month or months, and year) to which the information to be registered corresponds.

- Select all deaths in children between 2 months and 5 years of age in the period under study.

- Complete the information about each child:

  - Age
  - Sex
  - Cause of death: disease or accident
  - Place where death occurred: hospital, health center, home, etc.
  - Person who cared for the child in the home during the event that led to the death
  - Whether or not the child received medical attention during the illness that led to the death. Specify whether the child was treated by a physician, nurse, health worker, lay practitioner, etc.

ANNEX 5.B
MORTALITY IN THE HOME IN CHILDREN AGED 2 MONTHS TO 5 YEARS
SURVEY CHART

Area: _____ Month?Year:_____

	Child's Name				
Person responding to the questionnaire					
1. Age of the child (months and years)					
2. Home address					
3. Death reported or known by:					
4. Was the child's death caused by an accident (fall, drowning, etc.)? What type of accident or injury did the child have?					
5. Was the child's death caused by a disease?					
6. Do you know which disease the child died of?					
7. Did you think that the disease was severe? Why?					
8. How much time elapsed between the beginning of symptoms and the death?					
9. Did you seek care outside of the home while the child was ill?					
10. Where or to whom did you go in search of assistance?					
a. Government hospital					
b. Government heath center					
c. Private physician					
d. Community health provider					
e. Traditional healer					
f. Religious leader					
g. Pharmacy					
h. Other					
11. Where did the child die?					
a. In a public hospital					
b. In another public facility					
c. In a private facility					
d. In the home					

Observaciones:

Instructions for completing the Survey Chart:

1. The chart should be used to question every mother or family member of a child aged 2 months to 5 years who died.

2. Write the name of the child in row 1, and the name of the person who provides the information in row 2 in the corresponding column. Then note in row 3 the age of the child at the time of death in months and years.

3. Note in the two following rows the home address and the source of the information about the child's death, in the corresponding column.

4. Answer questions 4 through 11. Write the response to each question in the box corresponding to the name of the child.

5. Proceed similarly with the next mother (or other responsible person), and so on for each child aged 2 months to 5 years who died in the home.

6. Continue filling in charts until information has been recorded on as many children who died in the home as required by the calculations of sample size.

ANNEX 5.C
MORTALITY IN THE HOME IN CHILDREN AGED 2 MONTHS TO 5 YEARS
INFORMATION CONSOLIDATION TABLE

Health Service: _____ Period/Year: _____ Age Group: _____

CAUSE OF DEATH	TOTAL DEATHS	IN PUBLIC HOSPITALS	IN OTHER PUBLIC HEALTH FACILITIES	IN PRIVATE HEALTH FACILITIES	IN THE HOME			NOT SPECIFIED
					TOTAL	HAD CARE FROM HEALTH WORKERS	DID NOT HAVE CARE FROM HEALTH WORKERS	
ALL CAUSES								
ACCIDENT								
DISEASE								
NOT SPECIFIED								

Observatons:

To complete the Information Consolidation Table:

Once the survey of the mothers or caregivers of children who died in the home is completed, use this information and the information collected from mortality records to complete the Information Consolidation Table, as follows:

1. Complete the upper part of the Information Consolidation Table, writing the name of the area, the period (months, year) corresponding to the information to be tabulated, and the age group (2 to 11 months, 1 to 5 years).

2. First tabulate the deaths obtained from the Civil Registry or from registries of a hospital or other health facility. For each death, select the Information Consolidation Table that corresponds to the child's age and proceed as follows:

   2.1. Select the row that corresponds to the registered cause of death: accident in row 3, disease in row 4, or not specified in row 5.

   2.2. Determine where the death occurred and select the corresponding column: public hospital, another public facility, private facility, home (total), or not specified.

   2.3. Make a mark (|) in the box that corresponds to the intersection of the row and column selected.

   2.4. In the cases of children who died in the home, also note in the corresponding boxes whether or not they received care from health workers for the accident or disease that was the cause of death.

3. Next, select the registry for the survey of deaths in the home that were not noted in the Civil Registry or health services records, and proceed as in item 2.

   3.1. Select the Information Consolidation Table that corresponds to the child's age at the time of death.

   3.2. Determine whether the cause of death was accident, disease, or not specified.

   3.3. Determine where the death occurred in accordance with the response to question 11.

   3.4. Make a mark (|) in the box that corresponds to the intersection of the row and column selected.

4. Once processing has been done on these data obtained from the Civil Registry, health services records, and surveys conducted, add the numbers in all the boxes of rows 3 and 4 to obtain figures for column 1 (**Total Deaths**). In cases of deaths in the home, include only the figures from the "total" column in this part of the table.

5. Finally, add up the numbers in the corresponding boxes of each column in rows 3, 4, and 5, and write the results in row 2 (**All Causes).**

PROTOCOL 6

IMPACT OF THE IMCI STRATEGY ON THE PROFILE OF HOSPITALIZED CHILDREN

INTRODUCTION

ARI (mainly pneumonia), diarrheal diseases (especially diarrhea with dehydration), malnutrition, and, in endemic areas, malaria, account for a high percentage of hospital discharges of children under age 5 in the developing countries. Although many of these hospitalizations are justified by the severity of the patient's condition, it is also clear that many cases could be adequately treated as outpatients.

For example, some cases of pneumonia do not require hospital treatment and can be adequately handled with an antibiotic on an outpatient basis; and some cases of diarrhea with dehydration can be effectively treated with oral rehydration therapy.

Unnecessary hospitalization of children under 5 with ARI, diarrhea, malnutrition, malaria, and other childhood illnesses exposes the child to unnecessary risk. It also affects the family and the health services, and increases the costs of treatment without offering corresponding benefit in terms of curing the child.

There are various reasons for unnecessary hospitalization of cases of ARI, diarrhea, and other diseases, but the primarily cause if case management by first-level health workers.

Effective implementation of the IMCI strategy makes it possible to accurately distinguish cases that require hospital care from those that can be handled as outpatients. This establishes protocols for follow-up and reevaluation of cases during treatment to assess whether the child is improving.

Implementation of the IMCI strategy can affect the health services through two influences in hospital discharges:

- A reduction in the total number of cases referred, since many cases will be treated effectively on an outpatient basis.

- An increase in the proportion of severe cases among the hospitalized cases, since cases that can be treated as outpatients will not be admitted to the hospital.

OBJECTIVE

To determine the impact of effective implementation of the IMCI strategy on the diagnostic profile of hospitalized cases.

METHODOLOGY

For measurement of the proposed objective, the proportion of discharges for childhood pathologies classified as severe should be observed, before and after implementation of the IMCI strategy in the hospitals, to confirm whether hospital discharges for these causes decline or not.

For this study, hospitalizations for *severe pneumonia* and *diarrhea with severe dehydration* will be used as markers for evaluation of the profile. The proportion of discharges is determined by the ratio between the number of hospitalizations for severe pneumonia or diarrhea with severe dehydration and the total number of hospitalizations of children under 5.

Effective implementation of the IMCI strategy implies that:

- Health workers are trained in the theoretical and practical content needed for implementation of the strategy, preferably by having taken a clinical course in IMCI.

- The health services have the necessary supplies to carry out the recommendations for clinical assessment and treatment of children.

- Health workers have the opportunity to analyze problems and difficulties and raise questions about correct implementation of the IMCI strategy by means of follow-up visits after training and periodic supervision, both direct and indirect.

- The community using the health services has access to educational activities, both individual (before, during, and after the consultation) and in groups (through talks, meetings, and similar activities).

The target population for the study consists of children under 5 years of age admitted to selected hospitals for any cause. In calculating the sample size and the observation period, one should take into account the magnitude of the problem before implementation of the strategy, or at the start of implementation, and the expected impact. Steps for calculating the sample size are described in Part II, Support Module for Statistical Methodology, in the section on research that compares situations before and after implementation of the IMCI strategy.

Data will be obtained from the discharge registry of the pediatric ward (or the rooms that correspond to it, depending upon the hospital's structure), or the Hospital Discharge Registry. (In the latter case the acquisition of data will be more complicated because the relevant cases must be singled out from among other age groups and diagnoses.)

The discharge registry that is used should include the following data:

- Age of the child
- Sex
- Diagnosis
- Date of discharge
- Cause of discharge

The date of discharge and the sex and age of the child are usually recorded in the discharge registry. Age should be recorded in both months and years so that the group of young infants between 1 week and 2 months of age can be studied.

The discharge diagnosis is recorded in the child's medical record. If different terms are used for a single pathology, reference diagnoses should be selected for coding the information. The diagnoses in the International Classification of Diseases can be used for this purpose, or another way of grouping can be defined. The cause of discharge is also obtained from the medical record.

The information from the discharge registry should be tabulated to obtain data on the total number of discharges of children under 5 and the number of discharges in this group for severe pneumonia and for diarrhea with severe dehydration. This information should be obtained for each age group selected.

It should be emphasized that any change in the profile of hospital discharges will depend on effective implementation of the IMCI strategy in all, or the majority, of the health services that refer patients to that hospital. This means that the IMCI strategy should be implemented not only in the outpatient clinic and emergency room of the hospital but also in the health centers that use the hospital for case referral.

Annex 6.A presents a model Data Collection Chart for compiling information from the registries in order to facilitate its later processing.

Annex 6.B presents a model Information Consolidation Table, followed by instructions for completing it. Using the information indicators can be calculated for the proportion of cases of childhood illness hospitalized, either for all the diagnoses or for each diagnosis studied. Indicators for the proportion of cases of each illness among the total number of cases can also be calculated. Table 6.1 sets out some examples of indicators for this study. Based on these examples, similar indicators can be formulated for any other diagnosis.

In order to accomplish the study's objective, a hypothesis test should be carried out for the principal indicators in order to find out whether implementation of the strategy produced changes in the hospital profile of the pathologies targeted by the IMCI strategy. For calculation of this test, refer to the Support Module for Statistical Methodology in Part II.

Table 6.1

INDICATOR	NUMERATOR	DENOMINATOR
Proportion of all hospitalizations of children under 5 years for severe pneumonia	Total number of hospitalizations for severe pneumonia in children under 5 years	Total number of hospitalizations for any cause in children under 5 years
Proportion of all hospitalizations of children under 5 years for diarrhea with severe dehydration	Total number of hospitalizations for diarrhea with severe dehydration in children under 5 years	Total number of hospitalizations for any cause in children under 5 years
Proportion of all hospitalizations of children under 2 months for severe pneumonia	Total number of hospitalizations for severe pneumonia in children under 2 months	Total number of hospitalizations for any cause in children under 2 months
Proportion of all hospitalizations of children under 5 years for severe pneumonia compared to children under 2 months	Total number of hospitalizations for severe pneumonia in children under 2 months	Total number of hospitalizations for severe pneumonia in children under 5 years
Proportion of all hospitalizations of children under 2 years for diarrhea with severe dehydration	Total number of hospitalizations for diarrhea with severe dehydration in children under 2 years	Total number of hospitalizations for any cause in children under 2 years

ANNEX 6.A
PROFILE OF CASES HOSPITALIZED FOR CHILDHOOD ILLNESS

DATA COLLECTION CHART

Health Service: _____ Period/Year: _____

No.	SURNAME AND GIVEN NAMES	SEX	AGE	DIAGNOSIS	CAUSE OF DISCHARGE

Observations:

To complete the Data Collection Chart:

- Complete the upper part of the chart, writing the name of the health service and the period (week, month or months, and year) corresponding to the information to be registered.
- Select the Hospital Discharge Registry corresponding to the first day of the chosen period.
- Review the discharge registry to find the first case of a child under 5 hospitalized for any cause in the selected period.
- Note the data on the chart.
- Continue to record the following cases of children under 5 hospitalized for any cause during the period of the study.

ANNEX 6.A
HOSPITALIZATIONS FOR CHILDHOOD ILLNESS

INFORMATION CONSOLIDATION TABLE

Health Service: _____ Period/Year: _____

	TOTAL CHILDREN UNDER 5 YEARS	UNDER 2 MONTHS	2 MONTHS TO 11 MONTHS	1 TO 4 YEARS
TOTAL DISCHARGES FOR ANY CAUSE				
TOTAL DISCHARGES FOR CHILDHOOD ILLNESS				
DICHARGES FOR SEVERE PNEUMONIA				
DISCHARGES FOR DIARRHEA WITH SEVERE DEHYDRATION				

Observations:

To complete the Information Consolidation Table:

1. Complete the upper part of the table, writing the name of the hospital or ward and the period (week, month or months, and year) corresponding to the information to be registered.

2. Select the Data Collection Chart for the chosen period.

3. Count the total number of discharges for any cause of children under 2 months during the selected period and note the number in column 3 (**Under 2 Months**) of row 2 of the table (**Total Discharges for Any Cause**). Proceed similarly with the discharges for any cause of children aged 2 to 11 months and note them in column 4 (**2 to 11 Months**) of row 2; and with the discharges for any cause of children aged 1 to 4 years, noting them in column 5 (**1 to 4 Years**) of row 2.

4. Proceed as indicated in point 3, counting successively the discharges of each group for severe pneumonia and for diarrhea with severe dehydration.

5. Once step 4 is completed, proceed as follows:

   5.1. Add columns 3, 4, and 5 of row 2 and note the resulting sum in column 2 of this row.

   5.2. Proceed as indicated in step 5.1. with rows 3 and 4.

   5.3. Finally, add rows 3 and 4 of columns 2 through 5 and note the resulting number in the respective columns of row 2.

PROTOCOL 7

IMPACT OF THE IMCI STRATEGY ON THE PREVALENCE OF ANEMIA IN CHILDREN AGED 2 MONTHS TO 4 YEARS SEEN IN THE HEALTH SERVICES

INTRODUCTION

Anemia is an important health problem in children because it affects their normal growth and development, and because it represents an associated risk factor that reduces the child's capacity to respond to diseases. The prevalence of anemia varies among countries and among different areas of the same country in relation to various factors, including the availability of food, feeding practices, and the prevalence of certain intestinal parasitic diseases.

Implementation of measures to control and prevent anemia is a necessity in all developing countries in order to reduce the prevalence of this problem.

The Integrated Management of Childhood Illness strategy incorporates detection of anemia in the clinical assessment of the child, utilizing the *palmar pallor* indicator. Children who are classified as having severe *palmar pallor* are admitted to a hospital for treatment, and children with *non-severe palmar pallor* are treated with iron administered daily for 2 months, with controls every 15 days.

This strategy also incorporates the systematic education of parents about proper child feeding, as well as identification and treatment of intestinal parasitic diseases.

Systematic implementation of the IMCI strategy can produce change in the prevalence of anemia in children aged 2 months to 4 years, as the number of identified and treated children increases, feeding practices are modified, and the prevalence of intestinal parasitic diseases is reduced.

OBJECTIVE

To determine the impact of implementation of the IMCI strategy on the prevalence of anemia in children between 2 months and 4 years of age.

METHODOLOGY

For measurement of the proposed objective, the prevalence of cases of anemia should be observed in children aged 2 months to 4 years who have consultations at the health services, classified using the palmar pallor indicator, before and after implementation of the IMCI strategy in a specific geographic area.

The prevalence of children with anemia is determined by the ratio between the number of children who consult the health services and are classified with anemia through the palmar pallor indicator and the total number of children studied in this group.

Implementation of the IMCI strategy implies that:

- Health workers are trained in the theoretical and practical content needed for implementation of the strategy, preferably by having taken a clinical course in IMCI.

- The health services have the necessary supplies to carry out the recommendations for clinical assessment and treatment of children. In particular, they should always have available treatment for anemia and for intestinal parasitic diseases.

- Health workers have the opportunity to analyze problems and difficulties and raise questions about correct implementation of the IMCI strategy by means of follow-up visits after training and periodic supervision, both direct and indirect.

- The community using the health services has access to educational activities, both individual (before, during, and after the consultation) and in groups (through talks, meetings, and similar activities).

Fulfillment of these conditions is of fundamental importance for conducting the study, since otherwise a possible lack of impact will be related not to the results of the strategy but rather to deficiencies in its implementation.

In calculating the sample size and the observation period, one should take into account the dimensions of the problem before implementation of the strategy, or at the start of implementation, and the expected impact. Steps for calculating the sample size are described in Part II, Support Module for Statistical Methodology, in the section on research that compares situations before and after implementation of the IMCI strategy.

One or more health facilities should be selected, so as to accumulate a sufficient number of pediatric consultations in which children will be evaluated and classified with regard to the presence or not of the *palmar pallor* indicator.

Information for determining the prevalence of anemia can be obtained from the health services registries, either those in regular use or those that incorporate the format used in the IMCI clinical course. The possibility of using either of these registries, or the need to include a different registry, depends on the variables that have been selected for observation in the study:

- If the study is to be carried out on the total population of children served by the health services, both registries can be used.

- If the study also incorporates other variables, such as sex, race, nutritional status, and compliance with treatment, registries that contain all this information should be selected.

It is suggested the study be conducted initially on the total population, distinguishing only between age groups (children aged 2 to 11 months and children aged 1 to 4 years). Based on the results obtained, one can then evaluate the need to disaggregate these groups according to other variables.

Annex 7.A presents a model Data Collection Chart for compiling information from these registries in order to facilitate its later processing. For data processing, any computer program that allows preparation of a database can be used, such as Epi Info or a similar program. If manual processing is needed, there is an Information Consolidation Table in Annex 7.B. Based on this information, indicators for the proportion of children with anemia among those who consult the health services can be calculated. Table 7.1 sets out some examples of indicators for this study.

Table 7.1

INDICATOR	NUMERATOR	DENOMINATOR
Proportion of all children studied who were classified as anemic (with some palmar pallor)	Total number of children classified as anemic (with some palmar pallor)	Total number of children studied (with palmar pallor and without palmar pallor)
Proportion of children aged 1 to 4 years that were classified as severely anemic (with severe palmar pallor)	Total number of children aged 1 to 4 years classified as severely anemic (with severe palmar pallor)	Number of children aged 1 to 4 years studied (with palmar pallor and without palmar pallor)

Special considerations

Evaluation for the presence of anemia in a child should be standard practice in every pediatric consultation regardless of the reason for which the mother brings the child in. Otherwise, many of the children seen and identified in the Daily Consultations Registry will not have *palmar pallor* evaluated. If this is the case, there will be no guarantee that the failure to register this indicator means that the child did not have palmar pallor. If this is the case, the information obtained will correspond to only a fraction of the consultations. If the characteristics of this fraction differ from those of the entire group (with regard to age, sex, diagnosis, etc.), this can introduce bias into the conclusions. For example, if the evaluation of palmar pallor is only done when health workers suspect some problem in this regard, the proportion of cases of anemia recorded will be greater than the real prevalence.

Change in the prevalence of anemia will be more evident if the population on which the second-round study is conducted does not differ greatly from the population studied in the first round. If the health services expanded their coverage or new population groups are using the services that did not do so when the first evaluation of prevalence was carried out, this can lead to results that are not comparable.

Thus, the steps to determine the prevalence of anemia are:

- Separate the consultation registries at the health care facility to identify children who received services during the selected period and make sure that all the variables are recorded that are to be incorporated in the analysis of the results.

- Identify among these children those who were classified as *anemic* through evaluation of the some *palmar pallor* indicator or as *severely anemic* through the severe *palmar pallor* indicator.

- Repeat this activity at a different time, for example 6 to 12 months later, defining this interval in relation to the effective implementation of the IMCI strategy.

The information obtained should be tabulated to yield data on the total number of children with anemia according to age, and according to any other variable that one wishes to include in the study.

ANNEX 7.A
PREVALENCE OF ANEMIA IN CHILDREN AGED 2 MONTHS TO 4 YEARS

DATA COLLECTION CHART

Health Service: _____ Period/Year: _____

No.	SURNAME AND GIVEN NAMES	AGE	CLASSIFICATON

Observations:

To complete the Data Collection Chart:

- Complete the upper part of the chart, writing the name of the health service and the period (week, month or months, and year) corresponding to the information to be tabulated.
- Select the Daily Patient Log corresponding to the period to be studied.
- Review the first daily registry selected to find the first child aged 2 months to 4 years.
- Write the child's name and age.
- Complete the classification column according to whether the child has been classified with palmar pallor or without palmar pallor.

ANNEX 7.B
PREVALENCE OF ANEMIA IN CHILDREN AGED 2 MONTHS TO 4 YEARS

INFORMATION CONSOLIDATION TABLE

Health Service: _____ Period/Year: _____

GROUP	SOME PALMAR PALLOR (ANEMIA)	SEVERE PALMAR PALLOR (SEVERE ANEMIA)	NO PALMAR PALLOR (NO ANEMIA)	TOTAL

Observations:

To complete the Information Consolidation Table:

1. Complete the upper part of the table, writing the name of the health service, and the period (week, month or months, and year) to which the information corresponds.

2. Complete the different rows of the table with the different groups into which the population under study will be subdivided: for example, according to age (from 2 to 12 months and from 1 to 4 years), or according to another variable chosen for inclusion.

3. Find the record for the first child aged 2 months to 4 years who was served during the period and note the child's classification with regard to *anemia* and *severe anemia.* In order to calculate the prevalence of anemia one needs to know the anemia classification of all the children selected during the study period. It is important to ensure that this classification has been noted for all the children, and that the absence of a note does not mean that health workers did not evaluate the *palmar pallor* indicator. To ensure that the anemia status is recorded, one can use the forms from the IMCI Clinical Course (these call for classifying every child with regard to all the indications included in the evaluation), or coordinate with the health workers who will take part in the study to ensure that they always indicate in the normal registry whether the child has *palmar pallor* or not, and whether it is mild or intense.

4. Select the row of the table that corresponds to the child, according to the variables that have been selected, and make a mark (|) in the appropriate column according to whether the child had *mild palmar pallor/mild anemia* (column 2), or *intense palmar pallor/severe anemia* (column 3), or *no palmar pallor/no anemia* (column 4).

5. Continue with the next child, proceeding as in the previous case.

6. Once the registries of all the children who had consultations during the selected period have been reviewed, the number of marks (|) in each box of the table should be added and the resulting number noted in each box.

7. Calculate the totals of the rows and columns, adding up the numbers noted in the different boxes.

8. Calculate the percentage of children with anemia and severe anemia by dividing the numbers in the columns 2 and 3 of each row by the total of the same row (column 5).

PROTOCOL 8

IMPACT OF THE IMCI STRATEGY ON THE PREVALENCE OF INTESTINAL PARASITIC DISEASES IN CHILDREN 2 TO 4 YEARS OF AGE

INTRODUCTION

In recent years steadily increasing importance has been attributed to intestinal parasitic diseases as a health problem for children in the developing countries, especially in light of the effects of these diseases on nutritional status and child development. Intestinal parasitic diseases are not an important cause of mortality, but they are a frequent cause of morbidity in children in the majority of developing countries, with a prevalence above 50% in many regions.

The effect of intestinal parasitic diseases on children's health is not limited to the specific diseases that are produced during the different cycles of each type of parasite, nor to the various organs that they affect. Intestinal parasitic diseases also cause malnutrition and severe anemia in children, affecting their development and their capacity to respond to other diseases.

As a result of their insipid nature and high prevalence——intestinal parasitic diseases are seldom what causes parents to bring children to the health services.

The IMCI strategy addresses the control of intestinal parasitic diseases in children from 2 to 4 years of age. It assumes that the majority of children suffer from these diseases, and the recommended intervention is therefore systematic treatment of children in this age group with a dose of mebendazole every six months. This is combined with teaching specific practices of care and treatment of the child in the home that help to reduce the risk of parasitic reinfection.

OBJECTIVE

To determine the impact of implementation of the IMCI strategy on the prevalence of intestinal parasitic diseases in children between 2 and 4 years of age.

METHODOLOGY

For measurement of the proposed objective, the proportion of cases of intestinal parasitic diseases among children aged 2 to 4 years who have consultations at the health services should be observed, before and after implementation of the IMCI strategy in a specific geographic area.

The proportion of children infected with parasites is determined by the ratio between the number of children served at the health facility who tested positive using the Kato-Katz method, and the total number of children studied in the age group from 2 to 4 years.

The study will be carried out before and after the IMCI strategy is implemented, in order to evaluate whether or not a reduction in the prevalence of intestinal parasitic diseases resulted from its implementation.

Implementation of the IMCI strategy implies that:

- Health workers are trained in the theoretical and practical content needed for implementation of the strategy, preferably by having taken a clinical course in IMCI.

- The health services have the necessary supplies they need to carry out the recommendations for clinical assessment and treatment of children. In particular, they should always have treatment available for anemia and for intestinal parasitic diseases.

- Health workers have the opportunity to analyze problems and difficulties and raise questions about correct implementation of the IMCI strategy by means of follow-up visits after training and periodic supervision, both direct and indirect.

- The community using the health services has access to educational activities, both individual (before, during, and after the consultation) and in groups (through talks, meetings, and similar activities).

Meeting these conditions is of fundamental importance for conducting the study. Otherwise a possible lack of impact will be related not to the results of the strategy but rather to deficiencies in its implementation. In the particular case of intestinal parasitic diseases, the IMCI strategy includes two types of interventions:

- The systematic administration of mebendazole to all children over 2 years old who have not received a dose of this drug in the previous six months (without determining whether each particular child is or is not infected with parasites).

  If the preference is to administer the treatment only to children with intestinal parasitic diseases confirmed by the Kato-Katz method, then all children who have consultations at the service and have not received a dosage of mebendazole in the last six months should be given this test. Therefore, they can be treated if the test is positive.

- Education of parents about personal, domestic, and environmental hygiene conditions that reduce the risk of intestinal parasitic diseases.

One or more health facilities should be selected in order to accumulate a sufficient number of consultations of children aged 2 to 4 years. This population will be studied to determine the prevalence of intestinal parasitic diseases using the Kato-Katz method, which identifies the types of parasites and measures the parasitic burden by determining the number of eggs per gram of feces.

The Kato-Katz study will be repeated at 4-month intervals in a sample of children with characteristics similar to the sample studied in the first round of this research, in order to determine the prevalence of intestinal parasitic diseases and the parasitic burdens and thus to evaluate the effect of the intervention undertaken as a component of the IMCI strategy.

In calculating the sample size and the observation period, one should take into account the dimensions of the problem before implementation of the strategy, or at the start of implementation, and the expected impact. Steps for calculating the sample size are described in Part II, Support Module

for Statistical Methodology, in the section on research that compares situations before and after implementation of the IMCI strategy.

Annex 8.A presents a model Data Collection Chart for compiling information on the children studied, for later processing. For data processing, any computer program that allows preparation of a database can be used, such as Epi Info or a similar program. If manual processing is needed, there is an Information Consolidation Table in Annex 8.B.

Based on the information from the table, indicators can be calculated for the prevalence of intestinal parasitic diseases in general and by type of parasite, including different combinations of parasites.

A hypothesis test should be carried out for the principal indicator in order to find out whether implementation of the strategy produced changes in the proportion of children aged 2 to 4 years who are infected with parasites. For calculation of this test, refer to the Support Module for Statistical Methodology in Part II.

Table 8.1 presents some suggested indicators that can be calculated from the Information Consolidation Table.

Table 8.1

INDICATOR	NUMERATOR	DENOMINATOR
Proportion of children who test positive for intestinal parasitic diseases among all children studied	Number of children who test positive for intestinal parasitic diseases	Número total de niños estudiados
Proportion of children with *Ascaris lumbricoides* among all children studied	Number of children with feces examination positive for *Ascaris lumbricoides*	Número total de niños estudiados
Proportion of children with *Trichuris trichiura* among all children studied	Number of children with feces examination positive for *Trichuris trichiura*	Número total de niños estudiados
Proportion of children with uncinarias among all 2-year-old children studied	Number of 2-year-old children with feces examination positive for uncinarias	Número total de niños de 2 años estudiados

ANNEX 8.A
PREVALENCE OF INTESTINAL PARASITIC DISEASES IN CHILDREN 2 TO 4 YEARS OF AGE

DATA COLLECTION CHART

Health Service: _____ Period/Year: _____

No.	SURNAME AND GIVEN NAMES	SEX	AGE	PARASITE					
				TYPE	BURDEN	TYPE	BURDEN	TYPE	BURDEN

Observations:

To complete the Data Collection Chart:

- Complete the upper part of the chart, writing the name of the health service and the period (week, month or months, and year) corresponding to the information to be tabulated.

- Write the name, sex, and age of the child being studied.

- Note the type of parasite and the parasitic burden. All the parasites found in each child should be included. If the child is not infected with parasites, write NONE in these columns.

ANNEX 8.B
EVALUATION OF THE PREVALENCE OF INTESTINAL PARASITIC DISEASES IN CHILDREN 2 TO 4 YEARS OF AGE

INFORMATION CONSOLIDATION TABLE

Service/Area: _____ Month/Year: _____

Age Group: _____

	TOTAL	TOTAL *ASCARIS*	TOTAL *TRICHURIS*	TOTAL UNCINARIAS	TOTAL OTHERS
TOTAL					
Do Not Have Parasites					
Have Parasites					
Only *Ascaris*					
Only *Trichuris*					
Only Uncinarias					
Only Other					
Ascaris + *Trichuris*					
Ascaris + Uncinarias					
Ascaris + Other					
Trichuris + Uncinarias					
Trichuris + Other					
Uncinarias + Other					
Three or More Parasites					

Observations:

To complete the Information Consolidation Table:

1. Complete the upper part of the table, writing the name of the health service or area where the work is carried out, and the period (week, month or months, and year) corresponding to the information to be tabulated.

2. Select the registries of results of the Kato-Katz study carried out in the period to which the table corresponds.

3. Note the figure for the total number of children surveyed in row 2 of column 2, called **Total.**

4. Note the number of children with negative Kato-Katz results, that is, those not infected with parasites (**Do Not Have Parasites**) in row 3 of column 2, called **Total.**

5. Note the number of children with positive Kato-Katz results, that is, those infected with parasites (**Have Parasites**) in row 4 of column 2, called **Total.**

6. Take the first registry with a positive Kato-Katz result, confirm the type of parasite found, and proceed as follows:

   a) If only a single type of parasite was found, look for the box at the intersection of the **Total** column and the row labeled with the name of that parasite and make a mark (|) in that box. This also applies to cases in which the parasite found is not one of the three mentioned in the table; in this case, make a mark in the box at the intersection of the **Total** column and the row labeled **Other.** Then, in the same row, make a second mark (|) in the box corresponding to the parasite diagnosed: *Ascaris, Trichuris,* Uncinarias, or Other.

   b) If two types of parasite were found, first look for the row corresponding to that combination and make a mark (|) in the box at the intersection of that row with the **Total** column. Then make another mark in each box of that row that corresponds to a parasite diagnosed, for example, in the column for *Ascaris* and the column for Uncinarias, or the column for *Ascaris* and the column for Other.

   c) If three or more types of parasite were found, make a mark (|) in the box at the intersection of the last row of the table and the **Total** column. Then make an additional mark in each box where that row intersects with the column of a parasite diagnosed.

7. Once the review of all the registries has been completed, add up the marks in each box and write the resulting number in the same box. Then add up the numbers in the boxes for each column and write the results in the corresponding box in the row labeled **Have Parasites.**

8. The totals of the boxes of rows 4 to 15 should not be added. Column 2 will show the number of children surveyed. The boxes in row 4 from columns 3 to 6 will show the total number of positive examinations for each type of parasite.

The information consolidated in this table does not include the parasitic burden (number of eggs per gram of feces), which can be included by subdividing the rows or the columns for each intestinal parasite.

PROTOCOL 9

IMPACT OF THE IMCI STRATEGY ON DEMAND FOR APPROPRIATE LEVEL OF CARE
INTRODUCTION

INTRODUCTION

Acute respiratory infections, diarrhea, malnutrition, anemia, malaria (in endemic areas), and other infectious diseases account for a high percentage of visits to the health services by children under 5 in the majority of the developing countries. Most of these cases are not severe and can be managed on an outpatient basis; only some require administration of a specific drug. Attending to children who are brought in for these reasons takes up most of the time and resources available for providing care.

Patients who present for urgent care need to be evaluated and treated by health workers however, at times they compete with less severe cases that could be treated adequately at home with symptomatic measures.

Unnecessary use of drugs, especially antibiotics is frequently seen in the less severe cases. This is due in part to pressure from children's caregivers and partly from health workers themselves who have inadequately assessed the patients.
The Integrated Management of Childhood Illness strategy is a very useful instrument for responding effectively to this problem.

First the strategy includes a protocol for evaluating the signs and symptoms of illness that occur most frequently in children under 5. This involves prioritizing those that can be associated with a severe illness, then those that can require a specific drug (especially antibiotics), and finally, those that are not associated with potentially serious diseases and can be handled with symptomatic measures.

Second, the strategy includes guidelines for following up on the progress of each case that requires outpatient treatment with specific drugs, in order to make sure that the child's condition is improving.

Finally, the IMCI strategy includes an important component of education for parents on caring for children in the home during illness and after recovery from illness, and on measures for preventing risk and disease.

Effective implementation of the IMCI strategy, therefore, can produce an important impact on the demand for treatment, discouraging people from seeking unnecessary consultations while at the same time reducing delays in securing medical care for illnesses that need to be evaluated by health workers. The end result is a reduction in severe cases caused by a delay in treatment.

OBJECTIVE

To determine the demand for appropriate level of care of children under age 5 and the impact of

effective implementation of the IMCI strategy on the number and distribution of consultations for childhood illness.

METHODOLOGY

One or more outpatient health facilities should be selected, including, if necessary, outpatient clinics and emergency rooms in hospitals, in order to accumulate a sufficient number of consultations for childhood illness in children under 5 and to determine the proportion of different illnesses, for the total group and by age group.

In the analysis, a distinction can be made between the diagnoses for ARI (pneumonia, bronchitis, bronchiolitis, flu, other ARI), diagnoses of diarrheal diseases (diarrhea with or without dehydration, dysentery, persistent diarrhea), malnutrition (severe or not), anemia, and malaria, for all children under 5 and by age group.

The study should be conducted before and after effective implementation of the IMCI strategy in the area covered by the health facilities included in the study.

Effective implementation of the IMCI strategy means that health workers apply the criteria for diagnosis and treatment proposed by PAHO/WHO, with whatever adaptations may have been made for the particular country.

Data will be obtained from the Daily Consultations Registry for each health facility, which should include the following information:

- Age of the child
- Sex
- Diagnosis

The child's age and sex are usually recorded in the outpatient care registries. Age should be recorded in both months and years so that the group of young infants between 1 week and 2 months of age can be studied.

The diagnosis from the consultation is also usually noted in the Daily Consultations Registry. If different terms are used for a single pathology, reference diagnoses should be selected for coding the information. The International Classification of Diseases diagnoses can be used for this purpose, or another way of grouping can be defined.

Information from the Daily Patient Log should be tabulated in order to obtain data on the total number of consultations for children under 5 and the number of these cases that were diagnosed or classified as ARI or diarrheal diseases (for both these categories, cases can be further classified by degree of severity), or malnutrition, anemia, malaria, etc.

This information should be obtained for the different age groups selected.

In calculating the sample size and the observation period, one should take into account the dimensions of the problem before implementation of the strategy, or at the start of implementation, and

the expected impact. Steps for calculating the sample size are described in Part II, Support Module for Statistical Methodology, in the section on research that compares situations before and after implementation of the IMCI strategy.

Data collection should be carried out in two different months (or in a shorter or longer period, depending on the number of consultations in the selected facilities), both before and after the IMCI strategy is implemented in these health services. This will make it possible to determine whether changes took place in the consultation profiles, with respect to both the number of cases of certain diagnoses and the proportional distribution of diagnoses.

Annex 9.A presents a model Data Collection Chart for compiling information from the outpatient services registries.

Annex 9.B presents a model Information Consolidation Table, followed by instructions for completing it.

Based on the information from the table, indicators can be calculated for the proportion of consultations for childhood illness, either for all diagnoses or for each diagnosis studied. Indicators can also be calculated for the proportion of cases of each illness among the total number of cases.

Table 9.1 contains examples of such indicators. On the basis of these, similar indicators can be formulated, changing the age groups or the diagnoses that are considered.

Table 9.1

INDICATOR	NUMERATOR	DENOMINATOR
Proportion of childhood illness among all consultations of children under 5 years	Total number of consultations for childhood illness in children under 5 years	Total number of consultations for any cause in children under 5 years
Proportion of cases of ARI among all consultations of children under 2 months	Total number of consultations for ARI in children under 2 months	Total number of consultations for any cause in children under 2 months
Proportion of cases of diarrhea among all consultations of children aged 1 to 4 years	Total number of consultations for diarrhea in children aged 1 to 4 years	Total number of consultations for any cause in children aged 1 to 4 years
Proportion of cases of diarrhea with dehydration among all consultations of children under 5 years	Total number of consultations for diarrhea with dehydration in children under 5 years	Total number of consultations for any cause in children under 5 years
Proportion of cases of malnutrition among all consultations of children under 2 months	Total number of consultations for malnutrition in children under 2 months	Total number of consultations for any cause in children under 2 months
Proportion of cases of pneumonia among all consultations for ARI in children under 5 years	Number of consultations for pneumonia in children under 5 years	Total number of consultations for ARI in children under 5 years
Proportion of cases of severe malaria among all consultations for childhood illness in children under 5 years	Number of consultations for severe malaria in children under 5 years	Total number of consultations for childhood illness in children under 5 years

ANNEX 9.A
CONSULTATIONS FOR CHILDHOOD ILLNESS

DATA COLLECTION CHART

Health Service: _____ Perio/Year: _____

No.	SURNAME AND GIVEN NAMES	SEX	AGE	DIAGNOSIS

Observations:

To complete the Data Collection Chart:

- Complete the upper part of the chart, writing the name of the health service and the period (week, month or months, and year) corresponding to the information to be registered.
- Select the Daily Consultations Registry for the first day of the chosen period.
- Review the Diagnoses Registry to find the first case of a child under age 5 who had a consultation for any cause during the selected period.
- Note the data on the chart.
- Continue to record subsequent cases of children under 5 who had consultations for any cause during the study period.

ANNEX 9.B
CONSULTATIONS FOR CHILDHOOD ILLNESS

INFORMATION CONSOLIDATION TABLE

Service: _____ Period/Year:_____

REASON FOR CONSULTATION	TOTAL CHILDREN UNDER 5 YEARS	CHILDREN UNDER 2 2 MONTHS	2 MONTHS TO 11 MONTHS	1 TO 4 YEARS
TOTAL CONSULTATIONS FOR ANY CAUSE				
TOTAL CONSULTATIONS FOR CHILDHOOD ILLNESS				
PNEUMONIA				
OTITIS				
OTHER ARI				
DIARRHEA				
DIARRHEA WITH DEHYDRATION				
PERSISTENT DIARRHEA				
DYSENTERY				
SEVERE MALARIA				
MALARIA				
MALNUTRITION				
ANEMIA				
OTHER				

Observations:

To complete the Information Consolidation Table:

1. Complete the upper part of the table, writing the name of the health service and the period (week, month or months, and year) to which the information corresponds.

2. Select the Daily Patient Log for the first day of the chosen period.

3. Count the total number of consultations for any cause of children under 2 months in the selected period and note the number in column 3 (**Under 2 Months**) of row 2 of the table (**Total Consultations for Any Cause**). Proceed similarly with the consultations for any cause of children aged 2 to 11 months and note them in column 4 (**2 to 11 Months**) of row 2, and with the consultations for any cause of children aged 1 to 4 years, noting them in column 5 (**1 to 4 Years**) of row 2.

4. Proceed as indicated in point 3, counting successively the consultations of each group for ARI, distinguishing between pneumonia and other ARI (or in more subgroups depending on interest), diarrhea, diarrhea with dehydration, malnutrition, anemia, malaria, etc.

5. Once step 4 is completed, proceed as follows:

    5.1. Add columns 3, 4, and 5 of row 2 and note the resulting sum in column 2 of this row.

    5.2. Proceed as indicated in step 5.1. with rows 4 to 15.

    5.3. Finally, add rows 4 to 15 of columns 2, 3, 4, and 5 and note the resulting number in the respective boxes of row 3 (**Total Consultations for Childhood Illness**).

PART IV

STUDIES TO EVALUATE THE APPLICATION OF THE IMCI STRATEGY ON CARE OF THE CHILD IN THE HOME

PROTOCOL 10

IMPACT OF THE IMCI STRATEGY ON THE PREVALENCE OF BREAST-FEEDING AMONG CHILDREN UNDER 2 SEEN IN THE HEALTH SERVICES

INTRODUCTION

The absence or short duration of breast-feeding is now recognized as one of the most significant factors contributing to disease and physical deterioration of children during the first years of life. In recent years it has been recognized internationally that children can be fed adequately with breast milk alone up to the age of 4 to 6 months, and that breast-feeding can be continued up to the age of 2 years, with complementary feeding of other foods.[1]

Exclusive breast-feeding during the first 4 to 6 months of life gives the child all the nourishment required for normal growth. Breast milk also provides children greater immunity to infections, ensuring a lower incidence of these illnesses and promoting faster recovery.

The incidence of diarrhea in children who are exclusively breast-fed is dramatically lower, since these diseases are closely related to unhygienic conditions in food preparation.. The incidence and severity of respiratory infections is also much less in children who are breast-fed exclusively.

In many developing countries the prevalence of breast-feeding practice in children under 2 is low. Although children younger than 6 months are breast-fed more frequently, breast-feeding is unnecessarily complemented with other types of food, water, teas, and other beverages, including other types of milk.

Education of mothers and families should include the importance of exclusive breast-feeding until the infant is 4 to 6 months old. The risks of not breast-feeding or of breast-feeding for too short a duration should also be emphasized.
The Integrated Management of Childhood Illness (IMCI) strategy includes an important component that promotes exclusive breast-feeding up to the age of 4 to 6 months and complementary breast-feeding up to the age of 2 years.

Effective implementation of the IMCI strategy will therefore help to increase the prevalence of breast-feeding in children under 2.

OBJECTIVE

To determine the impact of implementation of the IMCI strategy on the prevalence of exclusive breast-feeding up to the age of 4 months (or over the period established by local policy on breast-feeding) and complementary breast-feeding up to the age of 2 years.

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[1] The recommendation that all children under 2 years be breast-fed is subject to certain limitations, for example, those concerning the use of breast-milk substitutes for children of HIV-positive mothers.

METHODOLOGY

Measurement of the proposed objective will be done by observing the proportion of children who were exclusively breast-fed up to the age of 4 months (or over the period established by local breast-feeding policy) and the proportion who continued with complementary breast-feeding up to the age of 2 years, before and after implementation of the IMCI strategy.

The prevalence of exclusive breast-feeding is determined by the ratio between the number of children under 4 months (or another age established by local breast-feeding policy) who have consultations at the health services and who were exclusively breast-fed, and the total number of children surveyed.

The prevalence of complementary breast-feeding is determined by the ratio between the number of children between 4 months (or another age established by local breast-feeding policy) and 2 years who continued complementary breast-feeding, and the total number of children in that age group who were surveyed.

Effective implementation of the IMCI strategy implies that:

- Health workers are trained in the theoretical and practical content needed for implementation of the strategy, preferably by having taken a clinical course in IMCI.

- The health services have the necessary supplies to carry out the recommendations for clinical assessment and treatment of children.

- Health workers have the opportunity to analyze problems and difficulties and raise questions about correct implementation of the IMCI strategy by means of follow-up visits after training and periodic supervision, both direct and indirect.

- The community using the health services has access to educational activities, both individual (before, during, and after the consultation) and in groups (through talks, meetings, and similar activities).

Implementation of the IMCI strategy should guarantee the systematic application of the steps established in the strategy for assessment, classification, and treatment of children under 5 who visit the health services, including the components calling for assessment of the child's nutritional status and for counseling the mother about feeding practices.

The target population for the study consists of children under 2 years of age who have consultations at the health services where the study is conducted.

In calculating the sample size and the observation period, one should take into account the dimensions of the problem before implementation of the strategy, or at the start of implementation, and the expected impact. Steps for calculating the sample size for the study are described in Part II, Support Module for Statistical Methodology, in the section on research that compares situations before and after implementation of the IMCI strategy.

Data can be obtained from the existing clinical histories in the health services whenever these adequately record the feeding that each child receives up to 4 months and up to 2 years of age. If this information is not available or is not considered reliable, an additional registry should be used.

The data needed to determine the prevalence of breast-feeding are:

- The age of the child.
- The feeding that the child received from birth up to 2 years of age, or up to the child's current age if it is less than 2 years.

Unfortunately there are few services where this information is both available and reliable. Accordingly, an alternative methodology is presented below that can be used to measure the prevalence of breast-feeding in children who are brought in to the health services by their parents.

The suggested methodology involves carrying out a survey of all mothers of children under 2 who visit the health services over a period that is long enough to accumulate the number of cases needed for calculation of the indicators. The survey can be used in one or more health services, but it is important to ensure that the services selected are ones in which the IMCI strategy will be introduced, so that the impact of the strategy's implementation on the prevalence of breast-feeding can be evaluated later.

For recording the results of the survey, the chart in Annex 10.A can be used.

For data processing, any computer program that allows preparation of a database can be used, such as Epi Info or a similar program. If manual processing is needed, there is an Information Consolidation Table in Annex 10.B.

Using the information from the table, indicators for the prevalence of breast-feeding in children can be calculated. Table 10.1 gives some examples of indicators to calculate, along with formulas for the calculation.

Finally, a hypothesis test should be carried out for the principal indicators in order to find out whether implementation of the strategy produced changes in the prevalence of breast-feeding in children under 2. For calculation of this test, refer to the Support Module for Statistical Methodology in Part II.

Table 10. 1

INDICATOR	NUMERATOR	DENOMINATOR
Proportion of children under 4 months exclusively breast-fed	Number of children under 4 months exclusively breast-fed	Total number of children under 4 months
Proportion of children under 4 months mainly breast-fed	Number of children under 4 months mainly breast-fed	Total number of children under 4 months
Proportion of children under 4 months breast-fed to any degree	Total number of children under 4 months breast-fed to any degree	Total number of children under 4 months
Proportion of children aged 6 to 9 months receiving appropriate complementary feeding	Number of children aged 6 to 9 months breast-fed + opportune complementary feeding	Total number of children aged 6 to 9 months
Proportion of children aged 4 to 11 months who continue to be breast-fed	Number of children aged 4 to 11 months who continue to be breast-fed	Total number of children aged 4 to 11 months
Proportion of children aged 11 to 23 months who continue to be breast-fed	Number of children aged 11 to 23 months who continue to be breast-fed	Total number of children aged 11 to 23 months
Proportion of children under 12 months who are bottle-fed	Number of children under 12 months who are bottle-fed	Total number of children under 12 months

ANNEX 10.A
REGISTRY ON PREVALENCE OF BREAST-FEEDING IN CHILDREN UNDER 2
SURVEY CHART

Health Service: _____ Month/Year: _____

Child's name						
1. Child's age (months and years)						
2. Did you breast-feed the child yesterday?						
3. Yesterday, did you give the child:						
a. Vitamins, mineral supplements, medicines?						
b. Only water?						
c. Sweetened or flavored water?						
d. Fruit juice?						
e. Tea?						
f. ORS solution?						
g. Soft drinks?						
h. Formula?						
i. Milk (canned, powdered, or fresh)?						
j. Solid food?						
k. Other liquids?						
4. Did you feed the child anything in a bottle yesterday?						

Instructions for completing the Survey Chart:

1. The Survey Chart should be used to question every person who visits the health service with a child under 2. If the child is 2 years old or more, do not include that child in the chart, but wait for the next consultation.

2. If the child is under 2, write the child's name in row 1, in a blank column; and then note the child's age in months and years in row 2 of that column.

3. Ask the questions in points 3a through 3k, and in point 4. If the response to a question is "yes," write YES in the box corresponding to the name of the child; if the response is "no," write NO.

4. Proceed in the same way with the next mother of a child under 2.

5. Complete as many charts as needed to accumulate a sufficient number of mothers of children under 2. Take into account that there must be a sufficient number of children under 4 months of age, and from 4 months to 2 years of age, to be able to estimate the prevalence of exclusive breast-feeding up to 4 months and of complementary breast-feeding between 4 months and 2 years.

ANNEX 10.B
PREVALENCE OF BREAST-FEEDING IN CHILDREN UNDER 2
INFORMATION CONSOLIDATION TABLE

Health Service: _____ Period/Year: _____

DIAGNOSTIC	BREAST-FEEDING	EXCLUSIVE BREAST-FEEDING	MAINLY BREAST-FEEDING	FOOD	BREAST-FEEDING + FOOD	BOTTLE
TOTAL CHILDREN SURVEYED						
< 1 MONTH						
1 to <2 MONTHS						
2 to <3 MONTHS						
3 to <4 MONTHS						
4 to11 MONTHS						
12 to 23 MONTHS						

Observations:

To complete the Information Consolidation Table:

1. Complete the upper part of the Information Consolidation Table, writing the name of the health service and the period (week, month or months, and year) corresponding to the information to be tabulated.

2. Select the first survey registry corresponding to the first day of the period to be studied.

3. Check the age of the child and select the row corresponding to this age group in the Information Consolidation Table.

4. Check the response to question 2 on the Survey Chart for the child.

   4.1. If the response is YES, the child is breast-fed. Make a mark (|) in column 2 (**Breast-feeding**) in the row of the Information Consolidation Table corresponding to the child's age.

   4.2. If the response is NO, do not make any mark in the **Breast-feeding** column and continue.

5. Check the response to question 3 of the Survey Chart.

   5.1. If all the boxes for points b through k have a NO response for that child, then the child is exclusively breast-fed. Make a mark (|) in column 3 (**Exclusive Breast-feeding**) in the row of the Information Consolidation Table corresponding to the child's age.

   5.2. If there is a YES response for the child in one or more of the boxes for points b through k, do not make a mark in the **Exclusive Breast-feeding** column, and continue.

   5.3. If one or more of points b through g have a YES response but all points h through k have a NO response, the child is mainly breast-fed. Make a mark (|) in column 4 (**Mainly Breast-feeding**) in the row of the Information Consolidation Table corresponding to the child's age.

   5.4. If there is a YES response for the child in one or more of the boxes for points h through k, do not make a mark in the **Mainly Breast-feeding** column, and continue.

   5.5. If point j has a YES response, the child received solid or semisolid food. Make a mark (|) in column 5 (**Food**) of the row of the Information Consolidation Table corresponding to the child's age.

   5.6. If the response to point j is NO, do not make a mark in the **Food** column, and continue.

   5.7. If the response to point 2 of the Survey Chart is YES and the response to point j of question 3 is also YES, the child received breast-feeding and food. Make a mark (|) in column 6 (**Breast-feeding + Food**) in the row of the Information Consolidation Table corresponding to the child's age.

5.8. If the preceding condition is not met, do not make a mark in the **Breast-feeding + Food** column, and continue.

6. Check the response to question 4 of the Survey Chart. If the response is YES, then the child is fed with a bottle. Make a mark (|) in column 7 (**Bottle**) in the row of the Information Consolidation Table corresponding to the child's age. If the response is NO, do not make a mark in column 7. Proceed with the responses for the next child, following the steps listed above.

7. Once all the surveys conducted have been processed, add up the numbers contained in all the boxes of each column in order to obtain the figures that correspond to the first row (**Total Children Surveyed**).

PROTOCOL 11

IMPACTOF THE IMCI STRATEGY ON PARENTS' KNOWLEDGE OF DANGER SIGNS INDICATING WHEN TO TAKE A CHILD TO HEALTH SERVICES

INTRODUCTION

A primary factor contributing to the number of serious illnesses in children under 5 who are seen at the health services is the inability of parents of other caregivers to recognize early danger signs of illness.

In many countries even when the population has access to health services and health workers, sick children are not brought in for consultations, but instead are treated at home with household remedies. In some cases, healers and other traditional personnel also treat children. . Management of a child's illness in the home is not advised unless the treatments used are safe and that parents or caregivers know when the child should be seen by a health worker.

Delay in consulting the health services can lead to deterioration of the condition, which may result in hospitalization or even death. Therefore it is very important that the community know how to observe a sick child for the danger signs indicating when the child should be taken immediately to the health service.

Implementation of the Integrated Management of Childhood Illness strategy can help to improve the community's knowledge of these danger signs. An educational component regarding these danger sings should be used in every child consultation at the health services, regardless of the severity of the child's illness.

OBJECTIVE

To determine the impact of implementation of the IMCI strategy regarding parents and other caregivers knowledge of danger signs that indicate when to take a child to the health services for treatment, including both general danger signs and those that signal signs of progression of an acute respiratory infection (ARI) or diarrheal disease.

METHODOLOGY

Measurement of the proposed objective is done by observing the proportion of mothers of children under 5 who know the warning signs for ARI and diarrhea in a specific geographic area, before and after implementation of the IMCI strategy.

The following signs will be taken as indicators of knowledge of the warning signs that indicate a need for consultation:

In reference to pneumonia:

- Fast or difficult breathing.

In reference to diarrhea:

- Many watery stools, repeated vomiting, intense thirst, inability to drink or drinking poorly, fever, or blood in the stool.

The proportion of mothers who know the danger signs is determined by the ratio between the number of mothers who know the danger signs for consulting the health services (at least one sign for pneumonia and at least two signs for diarrhea) and the total number of mothers surveyed.

Effective implementation of the IMCI strategy implies that:

- Health workers are trained in the theoretical and practical content needed for implementation of the strategy, preferably by having taken a clinical course in IMCI.

- The health services have the necessary supplies to carry out the recommendations for clinical assessment and treatment of children.

- Health workers have the opportunity to analyze problems and difficulties and raise questions about correct implementation of the IMCI strategy by means of follow-up visits after training and periodic supervision, both direct and indirect.

- The community using the health services has access to educational activities, both individual (before, during, and after the consultation) and in groups (through talks, meetings, and similar activities).

Implementation of the IMCI strategy should guarantee the systematic application of the steps established in the strategy for assessment, classification, and treatment of children under 5 who visit the health services, including the components calling for assessment of the child's nutritional status and for counseling the mother about feeding practices.

The target population for the study consists of mothers or caregivers of children under 5 in a given geographic area.

In calculating the sample size and the observation period, one should take into account the dimensions of the problem before implementation of the strategy, or at the start of implementation, and the expected impact. Steps for calculating the sample size for the study are described in Part II, Support Module for Statistical Methodology, in the section on research that compares situations before and after implementation of the IMCI strategy.

The following data will be needed to determine knowledge of warning signs:

- The age of the child.
- The signs named by the survey respondent as indicating the need to take a sick child to a health worker or health service.

To obtain this information, a survey should be conducted of mothers or caregivers of children under 5. Respondents can be selected either:

- In the health services, from among those seeking consultations for any reason.
- In the community.

If the survey respondents are selected from among people visiting the health services, more rapid improvements can be anticipated, since these are likely to be people who visit the services regularly and thus will receive the educational content of the IMCI strategy at every consultation.

If the respondents are selected in the community, it is possible that they may not use the health services or may not use the services that are applying the IMCI strategy, and thus will not have access to education on the warning signs.

A mixed sample can be taken, drawing on people from both settings. Efforts should always be made to ensure the random selection of the people in both samples, in order to be able to evaluate the impact of implementation of the IMCI strategy on the community's knowledge base, that is, the effectiveness of the program. If the objective of the study were to evaluate the effectiveness of the counseling given to mothers, then the sample would include only mothers who have received counseling during consultations and in educational sessions at the health center or elsewhere in the community.

The Survey Chart in Annex 11.A can be used to record the results of the survey. For data processing, any computer program that allows preparation of a database can be used, such as Epi Info or a similar program. If manual processing is needed, there is an Information Consolidation Table in Annex 11.B.

Using the information from the Information Consolidation Table, indicators can be calculated for knowledge of the warning signs that indicate pneumonia or the need to seek care outside the home for diarrhea in children under 5.

Table 11.1

INDICATOR	NUMERATOR	DENOMINATOR
Proportion of mothers of children under 5 who know at least one danger sign of pneumonia in children	Number of mothers of children under 5 who know at least one danger sign of pneumonia	Total number of mothers of children under 5 surveyed
Proportion of mothers of children aged 1 to 4 years who know that fast breathing is a danger sign of pneumonia in children	Number of mothers of children aged 1 to 4 years who know that fast breathing is a danger sign of pneumonia	Total number of mothers of children aged 1 to 4 years surveyed
Proportion of mothers of children under 5 who know at least two signs indicating the need to seek care outside the home for a child with diarrhea	Number of mothers of children under 5 who know at least two signs indicating the need to seek care outside the home for a child with diarrhea	Total number of mothers of children under 5 surveyed

Finally, a hypothesis test should be carried out for the principal indicators in order to find out whether implementation of the strategy produced changes in the knowledge of mothers or caregivers of children under 5 with regard to danger signs in children who suffer from acute respiratory infection or diarrheal disease. For calculation of this test, refer to the Support Module for Statistical Methodology in Part II.

ANNEX 11.A
KNOWLEDGE OF DANGER SIGNS IN CHILDREN UNDER 5 INDICATING THE NEED TO SEEK CARE FROM THE HEALTH SERVICES

SURVEY CHART

Area: _____ Month/Year: _____

Child's Name							
1. Child's age (months and years)							
2. When should you take to a child with ARI to be seen at a health service?							
a. Fast breathing							
b. Difficult breathing							
c. Cough							
d. Fever							
e. Noisy breathing							
f. Not able to drink or drinking poorly							
g. Another sign							
h. Don't know							

3. When should you take a child with diarrhea to be seen at a health service or by health workers?							
a. Many watery stools							
b. Repeated vomiting							
c. Intense thirst							
d. Not able to drink or drinking poorly							
e. Fever							
f. Blood in the stool							
g. Does not improve, is sicker, is very sick							
h. Another sign							
i. Don't know							

Observations:

Instructions for completing the Survey Chart:

1. The Survey Chart should be used to question all mothers or other persons who participate in caring for a child under 5.

2. Write the child's name in row 1, in the corresponding column; and then note the child's age in months and years in row 2.

3. Ask the mother question 2. Formulate it as a "free-response question," without suggesting any of the signs listed in the following rows. Tell the mother that she can give more than one reason. Mark with an "x" the signs that she mentions. Encourage the mother to respond fully, using general queries such as *Nothing more?* or *Other signs?*, but do not lead her to mention specific signs.

4. Ask the mother question 3 on the Survey Chart, using the technique outlined in point 3 above.

5. Proceed similarly with the next mother of a child under 5.

6. Complete as many columns as needed to accumulate a sufficient number of mothers of children under 5. If the intent is to disaggregate the conclusions according to the age of the child, be sure to survey a sufficient number of mothers of children under 2 months, from 2 to 11 months, and from 1 to 4 years, so that there is enough data to estimate the proportion of these mothers who know the warning signs.

ANNEX 11.B
KNOWLEDGE OF DANGER SIGNS IN CHILDREN UNDER 5 WITH ARI OR DIARRHEA

INFORMATION CONSOLIDATION TABLE

Area:_____ Período/Year: _____

KNOWLEDGE	TOTAL	< 2 MONTHS	2-11 MONTHS	1-4 YEARS
TOTAL MOTHERS SURVEYED				
KNOWS AT LEAST 1 WARNING SIGN OF PNEUMONIA				
- KNOWS FAST BREATHING				
- KNOWS DIFFICULT BREATHING				
KNOWS AT LEAST 2 DANGERSIGNS TO SEEK CARE FOR A CHILD WITH DIARRHEA				

Observations:

Instructions for completing the Information Consolidation Table:

Once the survey has been completed, tabulate the data in the Information Consolidation Table.

1. Complete the upper part of the Information Consolidation Table, writing the name of the area where the survey was conducted and the period (months and year) corresponding to the information to be tabulated.

2. Select the first entry on the Survey Chart.

3. Check the age of the child and select the column of the Information Consolidation Table that corresponds to this age. Make a mark (|) in the row for **Total Mothers Surveyed**, in the column corresponding to the child's age.

4. Check the response to question 2 on the Survey Chart.

    4.1. If point 2.a or 2.b was marked, or both, the mother knows the danger signs of pneumonia (she is considered to know them if she mentions *fast breathing* or *difficult breathing*). In the Information Consolidation Table, make a mark (|) in the row for **Knows at least 1 danger sign of pneumonia**, selecting the column that corresponds to the child's age. Also make a mark (|) in the row for **Knows fast breathing** if point 2.a was marked, or in the row for **Knows difficult breathing** if point 2.b was marked.

    4.2. If neither point 2.a nor point 2.b was marked, then do not make any mark, and continue.

5. Check the mother's response to question 3 on the Survey Chart.

    5.1. If two or more signs were marked among points 3.a through 3.g, the mother knows the danger signs that indicate the need to seek care for a child with diarrhea. On the Information Consolidation Table, make a mark (|) in the row for **Knows at least 2 danger signs to seek care for a child with diarrhea**, selecting the column corresponding to the child's age.

    5.2. If none of the points from 3.a through 3.g were marked, or if only one of these points was marked, then do not enter any mark, and continue.

6. Proceed with the mother of the next child.

Once the review of the Survey Charts has been completed, add up the numbers in the boxes in each row for the columns corresponding to each age group and note this sum in the second (**Total**) column of the Information Consolidation Table.

PROTOCOL 12

IMPACT OF THE IMCI STRATEGY ON PARENT / CAREGIVER COMPLIANCE IN FOLLOW-UP CONSULTATION FOR CHILDREN WITH PREVALENT CHILDHOOD ILLNESSES

INTRODUCTION

Many of the hospitalizations and deaths of children under 5 that occur in the developing countries could be avoided if children were taken to the health services in a timely manner to receive the necessary treatment. For this reason, control of the major diseases and health problems that affect children under 5 in these countries is based on:

- Improving the knowledge of parents and other caregivers of children under 5 about danger signs that indicate the need to seek care outside the home.

- Improving the capacity of the first-level health services to carry out assessment, classification, and treatment of children under 5 who are seen at the service.

The Integrated Management of Childhood Illness strategy includes both these components.. The first aspect is included in the communication component that seeks to improve the family's ability to care for children under 5, avoiding unnecessary visits to the health services but ensuring that parents will seek care from the services whenever a child presents danger signs. This avoids overburdening the health services and inconveniencing the parents with unnecessary trips to seek care.

The second aspect is included in the problem-solving capacity at the first-level health services. The goal is to avoid unnecessary referrals to hospital I when children can be treated on an outpatient basis, while ensuring that critical cases are referred. The anticipated result reduces overcrowding and unnecessary hospitalizations that can cause complications for the child as well as problems for the child's parents.

With implementation of the IMCI strategy some of the children that can be treated by first-level health workers also require later follow-up in order to confirm that the condition improves with the prescribed treatment and that possible complications are prevented.

The emphasis on the need to bring the child back for a reevaluation and follow-up is an important part of the parent education component of the IMCI strategy. If the child is not brought back for a reevaluation and follow-up consultation the treatment cannot be assessed. The disease may progress and lead to death.

Assessing of the results of parental education on the need to return for reevaluation and follow-up consultation is an essential part of the IMCI strategy. It is expected that the proportion of cases that return for reevaluation and follow-up will increase as implementation of the strategy is improved.

OBJECTIVE

To determine the impact of communication components of the IMCI strategy on parents' compliance with reevaluation and follow-up consultation after treatment.

METHODOLOGY

For measurement of the proposed objective, the proportion of children under 5 who return for reevaluation and follow-up consultation in accordance with the standards of the IMCI strategy should be observed in the selected health services, before and after implementation of the IMCI strategy.

One or more health services should be selected in order to accumulate a sufficient number of consultations of children under 5 for ARI, diarrhea, malaria, malnutrition, and other diseases included in the IMCI strategy. Selected cases should be ones that are required to return for a reevaluation and follow-up consultation. The cases can be differentiated by diagnosis or by classification, in accordance with the standards of the IMCI strategy. Table 12.1 presents the IMCI standards on diseases that require a reevaluation and follow-up consultation.

Table 12.1 only includes classifications in which all cases are given appointments for reevaluation and follow-up consultations. It does not include those that receive follow-up appointments only if specific signs appear that indicate a probable worsening of the child's clinical condition.

Cases requiring re-assessment and follow-up consultation should be monitored. This determination should be carried out at two different times, before and after the effective implementation of the IMCI strategy. It can also be done immediately following implementation of the strategy, after carrying out parent education activities that reinforce the importance of returning for the reevaluation and follow-up consultation.

Table 12.1

CLASSIFICATION	REQUIRED TO RETURN FOR REEVALUATION AND FOLLOW-UP CONSULTATION
Pneumonía	After 2 days
Dysentery	
Malaria, if fever persists	
Fever (malaria unlikely), if fever persists	
Measles with eye or mouth complications	
Persistent diarrhea	After 5 days
Acute otitis media	
Chronic otitis media	
Feeding problem	
Anemia	After 14 days
Very lkow weight for age	After 30 days

Effective implementation of the IMCI strategy implies that:

- Health workers are trained in the theoretical and practical content needed for implementation of the strategy, preferably by having taken a clinical course in IMCI.
- The health services have the necessary supplies to carry out the recommendations for clinical assessment and treatment of children.
- Health workers have the opportunity to analyze problems and difficulties and raise questions about correct implementation of the IMCI strategy by means of follow-up visits after training and periodic supervision, both direct and indirect.
- The community using the health services has access to educational activities, both individual (before, during, and after the consultation) and in groups (through talks, meetings, and similar activities).

Implementation of the IMCI strategy should guarantee the systematic application of the steps for assessment, classification, and treatment of children under 5 who consult the health services. The *treatment* content includes measures aimed at educating parents about care of the child and about the importance of returning for the reevaluation and follow-up consultation within the time period indicated by the clinical classification.

The target population for the study consists of children under 5 who visit the selected health services and are classified with one of the pathologies that, in accordance with the IMCI strategy, requires them to return for a reevaluation and follow-up consultation.

In calculating the sample size to be studied and the observation period, one should take into account the dimensions of the problem before implementation of the strategy, or at the start of implementation, and the expected impact. Steps for calculating the sample size for the study are described in Part II, Support Module for Statistical Methodology, in the section on research that compares situations before and after implementation of the IMCI strategy.

If the study is intended to evaluate all the pathologies that should return for a reevaluation and follow-up consultation, then the least frequent pathology should be used for calculation of the sample. In this protocol, the proportion of cases of pneumonia that return for a reevaluation and follow-up consultation within the required time has been chosen as an indicator for assessing the impact of communication activities on parent behavior.

The information needed for the study can be obtained from the treatment registries in the health services selected. Some operational complications may be encountered in carrying out the study if the registries are incomplete.

It will be necessary to bring together information from the first consultation, when the child's disease is classified as one for which follow-up is required, and information from the reevaluation and follow-up consultation, which should be carried out within 2, 5, 14, or 30 days, depending upon the classification.

With regard to the first consultation, the following information is required:

- Age of the child
- Date of the consultation
- Diagnosis(es) or classification

The child's age and the date of the first consultation are normally included in the medical record. Age should be recorded in both months and years so that the group of young infants between 1 week and 2 months of age can be studied.

The diagnosis is usually noted by the physician in the medical record. If different terms are used for a single pathology, some reference diagnoses should be selected for coding the information. The International Classification of Diseases diagnoses can be used for this purpose, or another way of grouping can be defined.

With regard to the reevaluation and follow-up consultation, information should be obtained on:

- When the child was brought in for the reevaluation and follow-up consultation.
- The result of the reevaluation and follow-up consultation.

The easiest way to bring together the information is to review the medical record of the child, but since the services do not always have this type of registry, Annex 12.A presents a model chart to use for the study. This chart can be replaced with the clinical history where that is available and contains the necessary information.

For data processing, any computer program that allows preparation of a database can be used, such as Epi Info or a similar program. If manual processing is needed, there is an Information Consolidation Table in Annex 12.B.

Using the information from the Information Consolidation Table, indicators can be calculated in relation to the return of patients for reevaluation and follow-up and the evolution of their disease. This information can be calculated for the different age groups included in the study and for the different diagnoses or classifications of the IMCI strategy.

For the calculation of indicators on the evolution of cases at the time of the reevaluation and follow-up consultation, those cases in which the evolution was not specified should be excluded. For this purpose, the numbers in column 6 (**Not Specified**) should be subtracted from the numbers in column 2 (**Total**). The results of this subtraction will be used as the denominators.

The indicators presented in Table 12.2 should be regarded as examples, since other indicators can be calculated according to the diagnosis and age of the child.

Finally, a hypothesis test should be carried out for the principal indicator in order to find out whether implementation of the strategy produced changes in the cases that are brought in for reevaluation and follow-up consultations. For calculation of this test, refer to the Support Module for Statistical Methodology in Part II.

If the proportion of cases in which the evolution is not specified is very high (greater than 40%), the results of the study can have little value in relation to this question.

Table 12.2

INDICATOR	NUMERATOR	DENOMINATOR
Proportion of cases of pneumonia that returned for reevaluation and follow-up consultation	Total number of cases of pneumonia that returned for reevaluation and follow-up consultation	Total number of cases of pneumonia that were required to return for reevaluation and follow-up consultation
Proportion of cases of pneumonia that returned for reevaluation and follow-up consultation within the time indicated	Total number of cases of pneumonia that returned for reevaluation and follow-up consultation within the time indicated	Total number of cases of pneumonia that were required to return for reevaluation and follow-up consultation
Proportion of cases of pneumonia that returned for reevaluation and follow-up consultation within the time indicated and did not improve	Number of cases of pneumonia that returned within the time indicated and remained the same, **plus** number of cases of pneumonia that returned within the time indicated and became worse	Total number of cases of pneumonia that returned for reevaluation and follow-up consultation, **minus** number of cases of pneumonia that returned but whose evolution was not specified
Proportion of cases of pneumonia that did not return for reevaluation and follow-up consultation	Total number of cases of pneumonia that were required to return for reevaluation and follow-up consultation **minus** number of cases of pneumonia that returned	Total number of cases of pneumonia that were required to return for reevaluation and follow-up consultation

ANNEX 12.A
EVALUATION OF RETURN FOR REASSESSMENT AND FOLLOW-UP CONSULTATION

CASE FOLLOW-UP CHART

Surname and Given Names:_____ Age: _____

Home Address: _____

DATE		DIAGNOSIS			TREATMENT
CONTROLS		EVOLUTION			TREATMENT
DATE	TIME SINCE INITIAL DIAGNOSIS	IMPROVED	SAME	WORSE	

Observations:

Instructions for completing the Case Follow-up Chart:

A Case Follow-up Chart should be prepared for each case that comes under one of the classifications included in Table 12.1.

The chart can be prepared by the health workers who attend to patients in the health services, whenever they identify a case of the diseases previously mentioned. The charts can also be completed at the end of each day by reviewing the regular treatment registries for the cases that were seen that day.

Begin filling in the chart as follows:

- Complete the upper part of the chart, writing the surname and given names of the child, the age in years and months, and the home address.

- Write the date that the child was diagnosed or classified with one of the conditions included in Table 12.1.

- Write the diagnosis or classification in the space on the chart reserved for this purpose.

- Write the treatment that was given in the corresponding space.

If the chart is filled in by the health workers who provide care, the charts should always be available during the hours that patients are served so that they can be retrieved whenever a child returns for a reevaluation and follow-up consultation.

If the chart is filled in at the end of each day, it is important to ensure that all the information needed to complete an entry in the Case Follow-up Chart is noted in the registries in use.

In the latter case:

- At the end of each day, review all the charts that have been started and check in the treatment registries to see whether any of those children returned for a reevaluation and follow-up consultation for the disease previously diagnosed.

Fill in the chart as follows for each reevaluation and follow-up consultation:

- Note in column 1 of the chart the date when the child was brought in for a reevaluation and follow-up consultation for the episode being treated and the number of days elapsed since the first consultation.

- Mark in the section under **Evolution** whether the child's condition was found to be **Improved, the Same**, or **Worse** than in the first consultation.

- Note in the section under **Treatment** what was recommended for the child, whether *Continuing* with the treatment given in the first consultation, *Changing treatment*, or *Referral.*

- If, in the reevaluation and follow-up consultation, the child is found to have **Improved**, set the chart aside for later tabulation.

- If, in the reevaluation and follow-up consultation, the child is found to be **the Same**, keep the chart on hand for the second reevaluation and follow-up consultation that is included when a change of treatment is recommended.

La información de las fichas deberá tabularse para poder calcular la proporción de los casos que concurrieron a la consulta de reevaluación y seguimiento y la evolución que tuvieron.

The information in the charts should be tabulated in order to calculate the proportion of cases that returned for a reevaluation and follow-up consultation and the evolution of their disease.

ANNEX 12.B
RETURN FOR REASSESSMENT AND FOLLOW-UP CONSULTATION IN CASES OF CHILDHOOD ILLNESS IN CHILDREN UNDER 5

INFORMATION CONSOLIDATION TABLE

Health Service:_____ Period/Year:_____

Age Group:_____ Diagnosis:_____

		CASE EVOLUTION			
DIAGNOSIS	TOTAL	IMPROVED	SAME	WORSE	NOT SPECIFIED
TOTAL CASES THAT WERE REQUIRED TO RETURN FOR REEVALUATION AND FOLLOW-UP CONSULTATION					
CASES THAT RETURNED FOR REEVALUATION AND FOLLOW-UP CONSULTATION					
BEFORE THE TIME INDICATED					
AT THE TIME INDICATED					
AFTER THE TIME INDICATED					
DID NOT RETURN FOR REEVALUATION AND FOLLOW-UP CONSULTATION					

Observations:

Instructions for completing the Information Consolidation Table:

1. Complete the upper part of the Information Consolidation Table, writing the name of the health service, the period (week, month or months, and year) corresponding to the information to be tabulated, and the age group (children from 1 week to 2 months, 2 to 11 months, 1 to 4 years, or other groups if desired). Use a separate table for each age group that is studied.

2. Note the type of diagnosis (or classification according to the IMCI strategy) to be analyzed, in accordance with those given in Table 12.1 on reevaluation and follow-up consultations.

3. Find the first Case Follow-up Chart that corresponds to that diagnosis or classification. Check the age of the child and select the Information Consolidation Table that corresponds to that age group. Make a mark (|) in the box corresponding to row 2 of the table: **Total cases that were required to return for reevaluation and follow-up consultation.**

4. Review the Case Follow-up Chart to see whether the child was brought back for a reevaluation and follow-up consultation. Check whether the date the child returned coincides with what is recommended for the diagnosis or classification being analyzed. On this basis, select the row of the Information Consolidation Table to use; for example, if the child returned for a consultation before the indicated time, select the row **Before the time indicated.**

5. Check the Case Follow-up Chart to find the evolution of the child's clinical condition at the time of the reevaluation and follow-up consultation. On this basis, select the column of the Information Consolidation Table to use: for example, if the child was considered to have *improved*, select column 3: **Improved**. Once the row and column have been selected in this way, make a mark (|) in the box where they intersect.

6. Select a new Case Follow-up Chart and repeat steps 3 through 5.

7. Once the review of all the Case Follow-up Charts is completed, add up the number of marks (|) in each box of the table and write the resulting number in each.

8. Add up the numbers in all the boxes of each row in order to obtain the figures that correspond to column 1: **Total**.

Then add up the numbers in all the boxes of each column in order to obtain the figures that correspond to row 3: Cases that returned for reevaluation and follow-up consultation.

PROTOCOL 13

IMPACT OF THE IMCI STRATEGY ON COMPLIANCE WITH TREATMENT FOR ANEMIA IN CHILDREN AGED 2 MONTHS TO 4 YEARS

INTRODUCTION

Efforts to control diseases are contingent on health services providing accurate assessment, classification, and case management for specific illnesses. It is equally important that the community learn to recognize early danger signs and comply with recommended treatment, particularly in children under 5.

Ineffective case management by health services and lack of parental compliance with treatment recommendations may result in deterioration of the child's condition and hence may contribute to the loss of confidence in the health care system.

Compliance with treatment is dependent upon instructions from health workers and interpretation by parents or caregiver. Instructions must be clear and the appropriate time must be allocated for discussion. However, various factors can affect the family's comprehension of the instructions and their ability to carry them out: for example, illiteracy, child care practices, family dynamics and where the child actually resides and with whom.

In view of the consequences associated with inadequate treatment, it is useful to analyze the magnitude of this problem in order to determine the actions that may be taken during the reevaluation and follow-up consultation. This problem is particularly relevant in the treatment of anemia in children due to the required daily administration of iron over a two month period.

OBJECTIVE

To determine adherence to treatment for *anemia (non-severe*), characterized by the finding of some *palmar pallor*, through the administration of daily iron supplements for two months.

METHODOLOGY

For measurement of the proposed objective, the proportion of children aged 2 months to 4 years with anemia (non-severe) who are brought for reevaluation and follow-up consultations should be observed every 15 days in accord with the standards of the IMCI strategy in the selected health services, before and after implementation of the IMCI strategy.

The health workers responsible for assessment and classification of the children will have been previously trained in an IMCI clinical course. Therefore, they will have the knowledge and skills necessary for assessment, classification and treatment of children, and understand the importance of educating the parents on how to take better care of their children's health.

The population to be studied will consist of children between 2 months and 4 years of age who are classified as having *anemia* because health workers find the sign some *palmar pallor*. The

study does not include children with severe *palmar pallor*, who are classified as having *severe anemia* and are referred to a hospital.

The children classified, as having *anemia* will receive treatment with iron in the form of tablets or syrups, at one dose of 4 mg/kg/day, with a reevaluation and follow-up consultation every 15 days, in accord with the standards in the IMCI strategy.

The children included in the study should have similar characteristics with respect to:

- *Age and sex:* Compliance with treatment can differ with respect to these variables, since families may have different perceptions of the importance of the disease, or different ways of caring for the child, as the child's age increases.

- *Other disease classifications*, both at the time of entry into the study and during the study. Parents of children who consult the health services more frequently during the two months of treatment, or who are receiving care for other illnesses, will have more occasions to receive reminders from health workers about the importance of correctly administering the iron treatment.

In order to avoid the influence of these factors, the sample size can be increased; with a larger number of children, it will be possible to divide the sample into subgroups with different characteristics for analysis (see below).

In calculating the sample size and the observation period, one should take into account the dimensions of the problem before implementation of the strategy, or at the start of implementation, and the expected impact. Steps for calculating the sample size are described in Part II, Support Module for Statistical Methodology, in the section on research that compares situations before and after implementation of the IMCI strategy.

Of equal importance in determining sample size is the estimated dropout rate of children during follow-up.

In addition, the number of children in the sample should be adjusted with respect to age groups (from 2 to 11 months and from 1 to 4 years, for example), sex, and other variables that may divide the group.

The study is conducted by surveying the parents of children who were classified as having *anemia* by health workers, and who received a prescription and supply of iron for treatment with daily doses of iron for two months.

Since the IMCI strategy recommends a reevaluation and follow-up consultation every 15 days during treatment, parents will be given a quantity of iron that is sufficient for this period. Assessment of the parents' compliance with the treatment will thus be carried out at 15 days, 30 days, 45 days, and at the end of the two months, at the health service for those who attend the biweekly reevaluation and follow-up consultations, and in the home for those who do not return for these checks.

It is suggested that a medical record be used to collect information on each child in the study. This information should include:

- Data to identify the child (surname and given names, age, sex, home address), that will be completed at the time of the first consultation.

- The classification that the health workers assigned to the child's disease, also to be completed in the first consultation.

- Data on the characteristics of the child's family and on the administration of treatment, which will be completed in the reevaluation and follow-up consultations (at 15 days, 30 days, 45 days, and 2 months).

During the period between the biweekly consultations, it should be confirmed whether or not the child's parents have visited the health services because of another illness, to obtain more medicine, for immunization, or for a well-child check-up. During any such visit the parents may have received additional information or a reminder about the importance of complying with the prescribed treatment for anemia, and this can affect the results of the study. These cases should either be excluded from the study (including only the results up to the time of these consultations), or they should be analyzed as a separate group.

At every reevaluation and follow-up consultation, the parents should be asked about compliance with treatment. The questions about family characteristics and organization should also be asked. The answers should be compared against those given in the first consultation to see whether there has been any change.

For recording all this information, Annex 13.A presents a model chart that can be adapted and modified as need.

At the end of the study, the children's charts should be evaluated to select the ones to be included in the analysis. It is advisable either to include only those children who remained comparable throughout the entire study, or to form different groups for analysis within which the children are comparable.

Once the group of children to be included in the analysis has been defined, the results should be processed to calculate what proportion of the total recommended quantity of medicine each child actually received. The following formula is used:

$$\frac{\text{Volume (in ml) of doses administered x total number of doses administered}}{\text{Volume (in ml) of doses recommended x total number of doses recommended}} \times 100$$

For data processing, the medical records can be entered in a computer program (for example, EPI Info). Alternatively, one can first calculate the quantity of medicine administered and the percentage that it represents of the recommended total. The information can then be consolidated to calculate the proportion of children who received the prescribed treatment (adherent) and the proportion that did not (non-adherent).

Annexes 13.B and 13.C include the Information Consolidation Tables for both tasks. For consolidation of these results, if a computer program is not used, Information Consolidation Table 1 should be prepared for each group to be studied (as defined by variables of age, sex, etc.), and a row included for each group in Information Consolidation Table 2.

The calculations can be carried out for the total group of children included in the study or for the different subgroups into which they are divided. For the purpose of classification, the children can be subdivided into the following groups:

- Compliant: children who received between 90% and 110% of the recommended quantity of iron.

- Non-compliant: children who received less than 90% of the recommended quantity of iron (under-adherent); or who received more than 110% of the recommended quantity of iron (over-adherent).

Using the information from Table 2, compliance with treatment can be calculated for the total number of children included in the study and for each subgroup studied in relation to the selected variables.

Table 13.1 includes some examples of indicators to calculate, as well as formulas for the calculations. These indicators are provided only as examples, since it is also possible to calculate other ratios using the data in Table 2 as well as all the information recorded in the Survey Chart. Based on these data, the population studied can also be subdivided in relation to other factors such as the literacy level of the parents and the type of person who cares for the child during the day.

Tabla 13.1

INDICATOR	NUMERATOR	DENOMINATOR
Proportion of children who complied with treatment for anemia for the 2 months of treatment	Total number of children who complied with treatment for the 2 months	Total number of children who were evaluated regarding compliance with treatment for 2 months
Proportion of children who complied with treatment for anemia for the first 14 days	Total number of children who complied with treatment for the first 14 days	Total number of children who were evaluated regarding compliance with treatment for 14 days
Proportion of children aged 2 to 11 months who complied with treatment for anemia for the first 14 days	Total number of children aged 2 to 11 months who complied with treatment for the first 14 days	Total number of children aged 2 to 11 months who were evaluated regarding compliance with treatment for 14 days
Proportion of children who complied with treatment for anemia for the first 45 days	Total number of children who complied with treatment for the first 45 days	Total number of children who were evaluated regarding compliance with treatment for 45 days

For validation of the analysis, the number of children who dropped out during the study period—that is, those who did not return for consultation and were not reached by home visits—should be taken into account.

Finally, a hypothesis test should be carried out for the principal indicator in order to find out whether implementation of the strategy produced changes with regard to compliance with treatment among children classified with anemia. For calculation of this test, refer to the Support Module for Statistical Methodology in Part II.

ANEXO 13.A
ADHERENCIA AL TRATAMIENTO DE ANEMIA CON HIERRO
FICHA DE LA ENCUESTA

Name of child: _____ Name of mother: _____

Address: _____

Date of interview: ___/___/___ / Date of initial consultation: ___/___/___/

ANNEX 13.B

Child's identification data:		
Age: [_____] Sex: [____] Date of Birth: ____/____/____		
Mother's marital status	Stable union: Yes [__] No [__]	Living with partner: Yes [__] No [__]
	No partner [_____] Yes [__] No [__]	Unstable union: Yes [__] No [__]
Family Composition (people living in the same household):		
Father Yes ❑ No ❑	Grandmother Yes ❑ No ❑	Siblings Yes ❑ No ❑
Mother Yes ❑ No ❑	Grandfather Yes ❑ No ❑	– Older No. [__] –Younger No. [__]
Who takes care of the child: [_____]		
Mother's education: Primary [__] Years [___]	Secondary [__] Years [___]	Tertiary [___]
Father's education: Primary [__] Years [___]	Secondary [__] Years [___]	Tertiary [___]
Caretaker's education Primary [__] Years [___]	Secondary [__] Years [___]	Tertiary [___]
Housing		
Urban [___] Rural [___]	Number of rooms: [___]	Household water connection: Yes [__] No [__]
Bathroom: Yes [__] No [__]	Latrine: Yes [___] No [___]	Eating area Yes [__] No [__]
No. of people who sleep in the same room: [_____]	Number of people who sleep with the child: [__]	
Prenatal care for the birth of this child		
Prenatal check-ups Yes [__] No [__]	Health Center [___] Hospital [___]	Other: _____
Has the prenatal card Yes [__] No [__]	Early monitoring: Yes [__] No [__]	Periodic: Yes [__] No [__]
Birth of the baby and its feeding at birth		
Where was the baby born? Hospital [___]	Home [___]	Other: _____
Was the baby kept with you after it was born? Yes [__] No [__]	Did you breast-fed? Yes [__] No [__]	
When was the first time you breast-fed the baby?		
Was something given to the baby before breast-feeding? Yes [__] No [__] What was given?		
Who gave the order? Health workers [___]	Family member [__]	Other:_____
Why?		
At the hospital, did they give you any instructions on feeding the baby? Yes [__] No [__]		
What did they say?		
Did they give you any food for the baby when you left the hospital? Yes [__] No [__]		
What did they give you?		
In addition to breast milk, did you give anything else to the baby once you left the hospital? Yes [__] No [__]		
If you gave it something, what did you give it?		
Why?		

Monitoring of the baby

When was the first time you took the baby for a check-up?

Where did you take it? Health services [__] Healer [__] Other: _____

Does you have a vaccination card for the baby? Yes [__] No [__]

Vaccinations up to date? Yes [__] No [__]

Do you have a card for monitoring the baby's growth? Yes [__] No [__]

Monitoring up to date? Yes [__] No [__]

Family dynamics and care of the baby

Work Father Yes [__] No [__] Outside the home? Yes [__] No [__] Hours

Mother Yes [__] No [__] Outside the home? Yes [__] No [__] Hours

Do you have enough time to take care of the baby? Yes [__] No [__]

Why?

	Who is at home?	Who takes care of the baby?	Who feeds it?
Morning			
Noon			
Afternoon			
Night			

Consultation for the child classified as "anemic"

When was the child first taken for a consultation?

Who took the child to the health service?

Why was the child taken to the health service?

At the health service, what did they say was wrong with it?

At the health service, did they give the child any medicine? Yes [__] No [__]
(ask the mother to show you the drug(s) that were given)

Treating the child for anemia (referring to iron)

Why did the health workers give this medicine to the child?

How did the health worker tell you to give it this medicine?

Administering anemia treatments to the child

Was this treatment administered to the child? Yes [__] No [__] When was it first administered? [_____]

How was it administered? Who administered it? [_____]

How many times was the medicine given to the child and how? (ask for every day of treatment)

Days of treatment	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Was it given?															
Who gave it?															
How much was given?															

Did the child improve with the treatment? Yes [__] No [__] Why?

Do you recall any day that the child could not be given the medicine? Yes [__] No [__]

Why couldn't it be given?

How many times did this happen? [___] When did they give the medicine to the child for the last time? [___]

Who gave it? [_____] How much was given? Adequate [____] Inadequate [____]

Comments:

Did you give anything else to the baby once you left the hospital? Yes [__] No [__]

If you gave it something, what did you give it?

Why?

QUANTITY OF IRON ADMINISTERED AND QUANTITY RECOMMENDED FOR TREATMENT OF ANEMIA IN CHILDREN AGED 2 MONTHS TO 4 YEARS

INFORMATION CONSOLIDATION TABLE 1

Place: _____ Period: _____

Group: _____

Observations:

CHILD (1)	Volume (in ml) of the dose administered (2)	Total number of doses administered (3)	Volume administered (in ml) (2)x(3)= (4)	Volume (in ml) of the dose recommended (5)	Total number of doses recommended (6)	Volume recommended (in ml) (5)x(6)= (7)	% (4)÷(7)= (8)

Instructions for completing Information Consolidation Table 1:

1. Complete the upper part of the table, identifying the place and period in which the study was conducted.

2. Write in any other data identifying the group studied, such as age, sex, race, or any other variable considered important for subdividing the sample. A separate copy of Table 1 should be prepared for each of these subgroups. If this is not done, Table 1 should include the necessary identification data for specifying the subgroup to which each child belongs.

3. Select the charts for the children in the study, and select the copy of Table 1 that corresponds to the group for the child on the first chart.

4. In the selected Table 1, write the child's identification in row 2, column 1.

5. Note in column 2 the volume of the dosage that was administered to the child.

6. Note in column 3 the number of doses that were administered to the child.

7. Calculate the total volume of medicine that the child received, multiplying the volume of the dosage (column 2) by the number of doses administered (column 3). Write the number resulting from this multiplication in column 4.

8. Note in column 5 the volume of the dosage that should have been administered to the child.

9. Note in column 6 the number of doses that should have been administered to the child.

10. Calculate the total volume of medicine that the child should have received, multiplying the volume of the dosage (column 5) by the number of doses recommended (column 6). Write the number resulting from this multiplication in column 7.

11. Calculate the percentage of recommended medicine that the child actually received, dividing the volume received (column 4), by the volume that the child should have received (column 7). Write the result of this operation in column 8.

12. Continue with the next child, repeating the steps above.

13. Always exclude any result that is doubtful because of problems of recording, double classification, or any other reason.

ANNEX 13.C
STUDY OF COMPLIANCE WITH IRON TREATMENTS FOR ANEMIA IN CHILDREN AGED 2 MONTHS TO 4 YEARS

INFORMATION CONSOLIDATION TABLE 2

Place: _____ Period: _____

GROUP	CHILDREN WHO ADHERED TO TREATMENT	CHILDREN WHO DID NOT ADHERE TO TREATMENT		TOTAL
		UNDER-ADHERENCE	**OVER-ADHERENCE**	

Observations:

Instructions for completing Information Consolidation Table 2:

Information Consolidation Table 2 can be used to systematize the information that was recorded in Table 1 and to calculate the results showing the percentage of children that received the prescribed treatment (compliance with treatment) and the percentage that did not receive it (non-compliance).

Proceed as follows to complete Table 2:

1. Fill in the upper part of the table with data to identify the service and the period in which the study was conducted.

2. In column 1 of Table 2, write in the rows the names of the different subgroups into which the children were divided, for example, according to age (children from 2 to 11 months, and from 1 to 4 years), or according to sex (boys and girls), etc.

3. Select a copy of Table 1 that corresponds to one of the subgroups noted in a row. If a separate Table 1 was not prepared for each subgroup of children, but instead all the children were placed in a single table, begin with the child listed in row 1 of Table 1. Determine which subgroup the child belongs to and identify the row of Table 2 that corresponds to that subgroup (in this case, Table 1 must include all the data on the variables used to subdivide the children, such as age, sex, etc.).

4. Look at the figure in the last column of Table 1, showing the percentage of the recommended volume of medicine that was administered.

5. If the figure is between 90% and 110% (or between 0.9 and 1.1, if the multiplication factor 100 was not used), make a mark (|) in column 2 of the row corresponding to the child in Table 2.

6. If the figure is less than 90% (or less than 0.9), make a mark (|) in column 3 of the row corresponding to the child in Table 2.

7. If the figure is greater than 110% (or greater than 1.1), make a mark (|) in column 4 of the row corresponding to the child in Table 2.

8. Proceed in the same way with the next child, until data has been entered for all the children included in the groups corresponding to the rows in Table 2.

9. Once recording of the results is complete, add up all the marks in each box and note the sum in the same box.

10. Calculate the percentages for compliance and non-compliance by dividing the numbers obtained for each row (each subgroup) by the total number of children included in that row (the sum of children who complied with the treatment and those who did not comply with the treatment, by either under-compliance or over-compliance). The total percentage for non-compliance is calculated by adding the percentages for under-compliance and over-compliance.

11. Once all the percentages have been calculated, carry out the corresponding statistical tests for each subgroup into which the children were divided.

PROTOCOL 14

IMCI STRATEGY IN UNDERSTANDING COMPLIANCE WITH TREATMENTS PRESCRIBED BY HEALTH WORKERS

INTRODUCTION

Among all the factors that determine the success of health care, the most important are compliance with treatment and following recommendations from health workers. A variable proportion of complications or repeat consultations for a single episode of illness could probably be avoided if parents followed prescribed treatment and complied to the recommendations that promote early recovery from illness.

Lack of compliance with treatment can be attributed to numerous factors, including how well the health workers communicate information about treatment and general care of children, and the specific beliefs and habits of that particular family.

Both factors should receive close attention during the consultation. Improved communication and increased exchange of information with the child's family will lead to improved understanding of treatment recommendations. Enhanced communication will also help to identify inappropriate or potentially harmful habits and practices in the management of illness and allow health workers a chance to discourage these practices, while clearly explaining the reasons why.

It is imperative that the person providing care to the child fully understands the treatment and knows how to recognize signs that might indicate that the child condition is not improving.
Frequently, the person who accompanies the child to the health services is not the person who will care for the child. Many children are cared for by another family member, may stay in a child care center for part of the day, or are cared for by individuals who must divide their time between caring for them and other household or work activities. The treatment recommendations must then be passed on to another person.

The person who heard the recommendations may have a different perception or interpretation and may not communicate the information as clearly as was intended.

Given the importance of these factors on the treatment results the IMCI strategy includes an educational component aimed at strengthening the capacity of parents to carry out treatment and improve child care practices in the home. It is expected that implementation of the IMCI strategy will result in improved understanding of, and compliance with, recommendations for treatment and care of children in the home.

OBJECTIVES

To evaluate changes in the comprehension of and compliance with prescribed treatment on the part of persons responsible for children's care, as a result of systematic implementation of the IMCI strategy.

The following are some examples of specific objectives:

- To evaluate, in the person who brought the child to the consultation, the ability to name the child's disease and the principal recommendations for care of the child in the home, in relation to the information received from health workers.

- To evaluate, in the person who brought the child to the consultation, the ability to name the drugs prescribed and communicate how to administer them, in relation to the information received from health workers.

- To evaluate, in the person who brought the child to the consultation, the ability to identify danger signs in the child that require an immediate return to the health service; they should also be able to state when the child should return for follow-up, in relation to the information received from health workers.

- To evaluate compliance in the home with recommended drug treatment (quantity, number of times a day, total number of days), in relation to the information given by health workers during the consultation.

- To evaluate child care practices in the home.

METHODOLOGY

For the study, a population that has access to and makes use of health services applying the IMCI strategy should be selected, to make it possible to measure changes that occur in understanding of and compliance with recommendations for treatment and care of children in the home.

The following should be assessed before and after implementation of the IMCI strategy:

- The information that the health workers give to persons who bring in a child under 5 seeking care.

- The ability of these persons to explain the instructions they receive, as well as the diagnosis or classification of the disease.

- Compliance on the part of the child's caregiver with recommended treatment in the home.

The initial assessment can be made before health workers are trained in implementation of the IMCI strategy, in all the services participating in the study. The later assessment should be made after the services are implementing the IMCI strategy.

In order to ensure that the services are implementing the strategy, the following conditions should be met:

- Health workers responsible for providing outpatient care to children under 5 should have attended an IMCI clinical course that covers the theoretical content of the strategy and its practical application.

- The health service should have the necessary supplies to carry out the strategy, both for diagnosis (scales, registries, etc.) and for treatment (drugs and other supplies).

- The staff trained in implementation of the IMCI strategy should have received a follow-up visit after their training for the purpose of evaluating their application of the strategy, discussing with them any difficulties encountered, and devising solutions to these difficulties.

- Based on the follow-up visit after training, or on later periodic supervision, it should be determined that the health workers are implementing the strategy properly and that the health services have the elements they need to provide treatment.

These conditions must be met in order to be able to evaluate the impact of the IMCI strategy on comprehension of and compliance with recommendations for treatment and care of children in the home.

Several different methods will be used to assess the degree of comprehension and compliance with recommendations for treatment and care of the child in the home. They include:

- Direct observation of the consultation in order to ascertain: information given by the health workers to the child's caregiver about the child's disease, treatment instructions, including why and how to administer the treatment; general measures for care of the child at home; warning sign indicating the need to seek immediate assistance and when to return for a reevaluation and follow-up consultation.

- Interviewing the child's caregivers as they leave the health service with questions regarding:

  - The information they received from health workers about the child's disease, the treatment they should give, how to give it, general measures for care of the child at home that should be applied, when they should return for reevaluation and follow-up, and under what circumstances they should return immediately to the health service.

  - Their opinion of the information received from the health workers.

  - How they will treat and care for the child at home.

- Home visits may be conducted to find out from the child's caregivers how treatment has been given to the child in the home.

- Review of Daily Patient Log to confirm compliance with the reevaluation and follow-up consultation.

It is essential to evaluate the health workers communication skills with the mother or caregiver. The health worker must be able to communicate adequate information in an understandable manner in order for the caregivers to receive, interpret and implement this information in the home. If communication skills are not adequate it will not be necessary to proceed with the rest of the evaluation.

The mother's comprehension of the instructions from health workers will be evaluated as she leaves the consultation and again some days after the consultation, using interview techniques.

Finally, assessment of compliance with the recommendations will be done through the home interview and by verifying the child's return for reevaluation and follow-up. Other visits such as immunizations and growth monitoring may be an opportunity to very compliance.

The annexes present three model charts: a Consultation Observation Chart (Annex 14.A); a Chart for Interview with the Mother on Leaving the Consultation (Annex 14.B); and a Chart for Interview with the Mother During Home Visit to check on treatment compliance (Annex 14.C).

In addition, in the protocol for evaluating the return of children for follow-up consultations, instruments and instructions for evaluating the registries are included. It should be noted that return for the reevaluation and follow-up consultation is considered an adequate indicator of good comprehension of the treatment recommendations. These same instruments can be used to evaluate the return for immunization and for consultations to monitor the growth and nutritional status of the child.

The information obtained using these techniques should be consolidated and analyzed to obtain indicators that can be used to assess the level of compliance with treatment prescriptions, both before and after implementation of the IMCI strategy. Toward this end, it is useful to construct all the indicators that are judged relevant, taking into account that the charts contain a great deal of information. Consolidation and analysis of this information can be done by recording all or part of the data from the charts. If facilities are not available for this task, the Information Consolidation Table included in Annex 14.D can be used, making as many tables as necessary.

In calculating the sample size and the observation period, one should take into account the dimensions of the problem before implementation of the strategy, or at the start of implementation, and the expected impact. Steps for calculating the sample size are described in Part II, Support Module for Statistical Methodology, in the section on research that compares situations before and after implementation of the IMCI strategy. When it is considered necessary to divide the sample into subgroups, each of them should include at least 50 cases.

The population under study can be subdivided into numerous groups and will depend on the variables that one wants to study separately. For example: mothers of children under 1 year, only child cared for by the mother; the mother's years of education; the number of diseases that the child had at the time of the consultation; whether or not a reevaluation and follow-up consultation was needed; the number and type of drugs that were given for treatment. The variables can also refer to characteristics of the consultation itself, such as its duration or other elements of the visit.

All the indicators to be used should be defined in advance. Some indicators are included in the Information Consolidation Table and in Table 14.1. Others can be added, depending on the need or interest in studying additional variables.

Finally, a hypothesis test should be carried out for the indicators selected in order to find out whether implementation of the strategy produced changes in the components studied. For calculation of this test, refer to the Support Module for Statistical Methodology in Part II.

Table 14.1

INDICATOR	NUMERATOR	DENOMINATOR
Proportion of consultations in which health workers achieved good communication with the mother	Number of consultations in which the observer described the health workers as having good communication with the mother	Total number of consultations observed in which this indicator was recorded
Proportion of consultations in which health workers asked questions open to verification	Number of consultations in which health workers asked questions open to verification	Total number of consultations observed
Proportion of consultations in which health workers gave instructions on breast-feeding	Number of consultations in which health workers gave instructions on breast-feeding	Total number of consultations observed for which health workers should give instructions on breast-feeding (depends on the age of the child)
Proportion of mothers who explain correctly upon leaving the consultation how much medicine they should give the child	Number of mothers who explain correctly upon leaving the consultation how much medicine they should give the child	Total number of mothers interviewed upon leaving the consultation in cases where health workers have prescribed medicine for the child
Proportion of mothers who explain correctly upon leaving the consultation when they should return for a follow-up visit for the child's current episode of illness	Number of mothers who explain correctly upon leaving the consultation when they should return for a follow-up visit for the child's current episode of illness	Total number of mothers interviewed upon leaving the consultation whose children have been classified with a disease that requires a reevaluation and follow-up consultation
Proportion of mothers who gave the correct quantity of medicine to the child, at the time of the later home interview	Number of mothers who gave the correct quantity of medicine to the child, at the time of the later home interview	Total number of mothers interviewed in the home whose children were supposed to receive medicine
Proportion of mothers who are feeding their children correctly	Number of mothers who are feeding correctly in accordance with the recommendations of health workers, at the time of the later home interview	Total number of mothers interviewed who received counseling on correct feeding of the child
Proportion of mothers who returned on the date indicated for reevaluation and follow-up of the child's current episode of illness	Number of mothers who returned on the date indicated for reevaluation and follow-up of the child's current episode of illness	Total number of mothers who were required to return for a follow-up visit for the child's illness

ANNEX 14
UNDERSTANDING OF AND COMPLIANCE WITH TREATMENT RECOMMENDATIONS FOR CHILDREN

CONSULTATION OBSERVATION FORM

Health services: _____ Date of consultation: _____

Start of the consultation Time: [_____]	
Was the mother asked by health workers to enter the consultation room?	Yes [___] No [___]
By the health worker in charge of the consultation?	Yes [___] No [___] Other [_____]
Was she called by her name/surname?	Yes [___] No [___] By number: ? Yes [___] No [___]
Was the mother called in a friendly manner?	Yes [__] No [__] [_____]
Did the health worker greet the mother when she entered the consultation room?	Yes [__] No [__] Friendly Yes [___] No [___]
Was she invited it to sit down?	Yes [__] No [__] Friendly Yes [___] No [___]
Did the health worker ask general questions at first?	Yes [__] No [__] Friendly Yes [___] No [___]
Did the health worker ask the mother why she had brought the child?	Yes [__] No [__] Friendly Yes [___] No [___]
Did the health worker mention the child by name?	Yes [__] No [__] Friendly Yes [___] No [___]
Did the health worker describe the examination that would be performed?	Yes [__] No [__] Friendly Yes [___] No [___]
Assessing the child	
Questioning the mother about the child's health	
Did the health worker ask the evaluation questions?	Yes [__] No [__] Friendly Yes [___] No [___]
Were only closed questions asked?	Yes [__] No [__] Friendly Yes [___] No [___]
Was the information complemented with open questions?	Yes [__] No [__] Friendly Yes [___] No [___]
Was the mother comfortable expressing herself?	Yes [__] No [__] [_____]
Did the health worker achieve good communication with the mother?	Yes [__] No [__] [_____]
Observation and assessment of signs of disease in the child	
Did the health worker explain to the mother that he would examine the child?	Yes [__] No [__] Friendly Yes [___] No [___]
Did he explain to the mother what he was doing?	Yes [__] No [__] Friendly Yes [___] No [___]
Did he take this opportunity to show the mother the signs to look for?	Yes [__] No [__] Friendly Yes [___] No [___]
Was the mother comfortable expressing herself?	Yes [__] No [__] [_____]
Did the health worker achieve good communication with the mother?	Yes [__] No [__] [_____]
Monitoring the child's vaccination and nutritional status	
Did he check the vaccination status of the child?	Yes [__] No [__] Friendly Yes [___] No [___]
Did he explain to the mother the importance of this and reason for it?	Yes [__] No [__] Friendly Yes [___] No [___]
Did he take this opportunity to recommend that the child come in for the next check-up? Yes	[__] No [__] Friendly Yes [___] No [___]

Did he assess the nutritional status of the child?	Yes [__] No [__]	Friendly Yes [___] No [___]
Did he explain to the mother the importance of this and the reason for it?	Yes [__] No [__]	Friendly Yes [___] No [___]
Did he take this opportunity to recommend that the child come in for the next check-up?	Yes [__] No [__]	Friendly Yes [___] No [___]
Was the mother comfortable expressing herself?	Yes [__] No [__]	[_____]
Did the health worker achieve good communication with the mother?	Yes [__] No [__]	[_____]
Classification of the child's illness		
Did he explain what the child had to the mother?	Yes [__] No [__]	Friendly Yes [___] No [___]
Did he question the mother to see if she understood?	Yes [__] No [__]	Friendly Yes [___] No [___]
Did he complement the verification with open questions?	Yes [__] No [__]	Friendly Yes [___] No [___]
Was the mother comfortable expressing herself?	Yes [__] No [__]	[_____]
Did he achieve good communication with the mother?	Yes [__] No [__]	[_____]
On prescribing treatment for the child		
Indications for the treatment with some drug		
Did explain to the mother what drugs will be given to the child?	Yes [__] No [__]	Friendly Yes [___] No [___]
Did he explain how to prepare it?	Not applicable [____] Yes [__] No [__]	Friendly Yes [___] No [___]
Did her explain to the mother how much of the drug to give?	Yes [__] No [__]	Friendly Yes [___] No [___]
Did he explain how/when to give the drug to the child?	Yes [__] No [__]	Friendly Yes [___] No [___]
Did he explain how many times a day to give it to him?	Yes [__] No [__]	Friendly Yes [___] No [___]
Did he explain during how many days it should it be given?	Yes [__] No [__]	Friendly Yes [___] No [___]
Question the mother to see if she understood?	Yes [__] No [__]	Friendly Yes [___] No [___]
Did he complement the verification with open questions?	Yes [__] No [__]	Friendly Yes [___] No [___]
Did he ask the mother about potential problems?	Yes [__] No [__]	[_____]
Help the mother to solve the problems?	Yes [__] No [__]	[_____]
Was the mother comfortable expressing herself?	Yes [__] No [__]	[_____]
Did he achieve good communication with the mother?	Yes [__] No [__]	[_____]
Indications on Breast-feeding	Not applicable [_____]	
Did he ask the mother whether she was		
breast-feeding the child?	Yes [__] No [__]	Friendly Yes [___] No [___]
Did he ask how many times a day?	Yes [__] No [__]	Friendly Yes [___] No [___]
Did he ask whether she also breast-fed during the night?	Yes [__] No [__]	Friendly Yes [___] No [___]
Did he complement the verification with open questions?	Yes [__] No [__]	Friendly Yes [___] No [___]
Did he give her instructions to improve lactation?	Yes [__] No [__]	[_____]
Did he ask the mother about potential problems?	Yes [__] No [__]	[_____]
Did he help the mother solve the problems?	Yes [__] No [__]	[_____]
Was the mother comfortable expressing herself?	Yes [__] No [__]	[_____]
Did he achieve good communication with the mother?	Yes [__] No [__]	[_____]
Indications on the food and fluids that are being given to the child		
Did he ask whether the child receives other food or fluids?	Yes [__] No [__]	Friendly Yes [___] No [___]
Did he ask what food or fluids the child receives?	Yes [__] No [__]	Friendly Yes [___] No [___]
Ask how many times a day it receives them?	Yes [__] No [__]	Friendly Yes [___] No [___]

Did he ask what food she habitually gives the child?	Yes [__] No [__] Friendly Yes [___] No [___]
Did he ask about the size of the portions?	Yes [__] No [__] Friendly Yes [___] No [___]
Did he complement the verification with open questions?	Yes [__] No [__] Friendly Yes [___] No [___]
Did he give the mother instructions about feeding?	Yes [__] No [__] [_____]
Did he give the mother instructions about fluids?	Yes [__] No [__] [_____]
Did he ask the mother about potential problems?	Yes [__] No [__] [_____]
Help the mother solve the problems?	Yes [__] No [__] [_____]
Was the mother comfortable expressing herself?	Yes [__] No [__] [_____]
Did he achieve good communication with the mother?	Yes [__] No [__] [_____]
On the monitoring of warning signs in the child and subsequent follow-up	
Did he tell the mother to return for follow-up?	Yes [__] No [__] Friendly Yes [___] No [___]
Did he explain why she should return on that date?	Yes [__] No [__] Friendly Yes [___] No [___]
Did he use open questions to confirm that the mother understood?	Yes [__] No [__] Friendly Yes [___] No [___]
Did he ask the mother about potential problems?	Yes [__] No [__] [_____]
Did he help the mother solve the problems?	Yes [__] No [__] [_____]
Did he explain to the mother when to return immediately?	Yes [__] No [__] Friendly Yes [___] No [___]
Did he clearly explain the warning signs?	Yes [__] No [__] Friendly Yes [___] No [___]
Did he use appropriate language to explain them?	Yes [__] No [__] Friendly Yes [___] No [___]
Did he use open questions to confirm that the mother understood?	Yes [__] No [__] Friendly Yes [___] No [___]
Did he ask the mother about potential problems?	Yes [__] No [__] [_____]
Help the mother solve the problems?	Yes [__] No [__] [_____]
Did he explain to the mother when to return for other reasons (vaccination, monitoring of growth)?	Yes [__] No [__] Friendly Yes [___] No [___]
Did he use open questions to confirm whether the mother understood?	Yes [__] No [__] Friendly Yes [___] No [___]
Did he ask the mother about potential problems?	Yes [__] No [__] [_____]
Help the mother solve the problems?	Yes [__] No [__] [_____]
Was the mother comfortable expressing herself?	Yes [__] No [__] [_____]
Did he achieve good communication with the mother?	Yes [__] No [__] [_____]
Observations	**Time ended: [_____]**

ANNEX 14.B
UNDERSTANDING OF AND COMPLIANCE WITH TREATMENT RECOMMENDATIONS FOR CHILDREN

MOTHER'S "END-OF-CONSULTATION" INTERVIEW FORM

Health services: _____ Date of the consultation: _____

On the consultation in general	
Why did you visit the health service?	
Do you always go to these health services?	Yes [___] No [___] To another: [_____]
Are you satisfied with the care provided?	Yes [___] No [___]
Why?	
Did health workers ask to see the child's vaccination card?	Yes [___] No [___]
Do you have the child's vaccination card?	Yes [___] No [___]
[Ask the mother to show you the card. Are the vaccinations up-to-date?]	Yes [___] No [___]
Did health workers ask to see child's growth monitoring card?	Yes [___] No [___]
Do you have the child's growth monitoring card?	Yes [___] No [___]
[Ask the mother to show you the card. Has the child been adequately monitored?]	Yes [___] No [___]
[Nutritional status] Weight [_____] Height [_____] Age [_____]	
On the health care outcomes for the child	
Did the health worker say what the child had?	Yes [___] No [___]
What did he tell you?	
Are you satisfied with what he told you?	Yes [__] No [__]
Were you still unclear about something?	Yes [__] No [__]
What were you unclear about?	
Why didn't you ask the health workers about them?	
On the treatment prescribed for the child	
On the general treatment	
What treatment did the health worker say the child needed?	
Are you satisfied with the treatment given to him?	Yes [__] No [__]
Why?	

On the drugs	
Did he prescribe any medicines for the child?	Yes [__] No [__]
Which?	
1. [_____]	2. [_____]
3. [_____]	4. [_____]
Did he tell you what each of these medicines was for?	Yes [__] No [__]
What did he tell you?	
1. [_____]	2. [_____]
3. [_____]	4. [_____]
Did he explain how to give the medicines to the child?	Yes [__] No [__]
How much medicine do you have to give him?	
1. [_____]	2. [_____]
3. [_____]	4. [_____]
How many times a day do you have to give him each medicine?	
1. [_____]	2. [_____]
3. [_____]	4. [_____]
How are you supposed to give him each medicine? (schedule, before or after eating, etc.)	
1. [_____]	2. [_____]
3. [_____]	4. [_____]
For how many days do you have to give him each medicine?	
1. [_____]	2. [_____]
3. [_____]	4. [_____]
Do you think you'll have problems giving the medicines to the child?	Yes [___] No [___]
What problems do you think you'll have?	
Did you explain these problems to the health worker?	Yes [___] No [___]
If not, why not?	
If so, did the health worker help you figure out how to solve the problems?	Yes [___] No [___]
On breast-feeding (only if the child is less than 2)	
Did the health worker ask whether you were breast-feeding the child?	Yes [___] No [___]
Did he give you any advice on breast-feeding the child?	Yes [___] No [___]
If so, what did he say about breast-feeding the child?	
Do you think you'll have problems doing what the health worker told you to?	Yes [___] No [___]
What problems?	

Did you mention these problems to the health worker?	Yes [___] No [___]
If not, why not?	
If so, did they help you figure out how to solve the problems?	Yes [___] No [___]
Food and fluids given to the child	
Did the health worker ask what the child eats?	Yes [___] No [___]
Did he offer advice about feeding the child?	Yes [___] No [___]
If so, what did he say about feeding the child? And about fluids?	
Do you think you'll have problems doing what the health worker told you to?	Yes [___] No [___]
What problems?	
Did you explain these problems to the health worker?	Yes [___] No [___]
If not, why not?	
If so, did the health worker help you figure out how to solve the problems?	Yes [___] No [___]
On the warning signs that should lead parents to take the child immediately to the health service	
Did the health worker explain when you should return immediately?	Yes [___] No [___]
If so, when would you come immediately to get help?	
Do you think you'll have problems doing what the health worker told you to?	Yes [___] No [___]
What problems?	
Did you explain these problems to the health worker?	Yes [___] No [___]
If not, why not?	
If so, did the health worker help you figure out how to solve the problems?	Yes [___] No [___]
On the consultation of reevaluation and monitoring of the current disease of the child	
Did health worker explain when you should return see if the child is improving?	Yes [___] No [___]
If so, when will you return to see if the child is improving?	
Do you think you'll have problems doing what the health workers told you to?	Yes [___] No [___]
What problems?	

Did you explain these problems to the health worker? Yes [___] No [___]
If not, why not?
If so did the health worker help you figure out how to solve the problems? Yes [___] No [___]
On the next consultation of the child for vaccination or monitoring growth
Did health worker tell you when to return to vaccinate the child? Yes [___] No [___]
If so, when will you return to vaccinate the child? For what vaccination(s)?
Did the health worker tell you when to return to monitor the child's growth? Yes [___] No [___]
If so, when will you return to monitor the child's growth?
Do you think you'll have problems doing what the health worker told you to? Yes [___] No [___]
What problems?
Did you explain these problems to the health workers? Yes [___] No [___]
If not, why not?
If so, did the health workers help you figure out how to solve the problems? Yes [___] No [___]
Observations:

ANNEX 14.C
UNDERSTANDING OF AND COMPLIANCE WITH TREATMENT RECOMMENDATIONS FOR CHILDREN

MOTHER'S HOME INTERVIEW FORM

First and last name of the child: _____

First and last name of the mother: _____

Address: _____

Date of the interview: ___/___/___Date of the initial consultation: ___/___/___

Child's identification data:	
Age: [_____] Sex: [____] Date of Birth: ____/____/____	
Marital status of the mother Stable union Yes [__] No [__] Living with partner: Yes [__] No [__]	
No partner [_____] Yes [__] No [__] Unstable union Yes [__] No [__]	
Family composition (people living in the same household):	
Father Yes [__] No [__] Grandmother Yes [__] No [__]	Siblings Yes [__] No [__]
Mother Yes [__] No [__] Grandfather Yes [__] No [__]	Older No. [_____] Younger No. [_____]
Who takes care of the child: [_____]	
Mother's education: No schooling [__] Primary [__] Years [___] Secondary [__] Years [___] Tertiary [___]	
Father's education: No schooling [__] Primary [__] Years [___] Secondary [__] Years [___] Tertiary [___]	
Caretaker's education No schooling [__] Primary [__] Years [___]	
Housing	
Urban [___] Rural [___] Number of rooms: [___]	
Household water connection: Yes [__] No [__]	
Bathroom: Yes [__] No [__] Latrine: Yes [___] No [___] Eating area: Yes [__] No [__]	
No. of people who sleep in the same room: [_____]	
Number of people who sleep with the child: [_____]	
Prenatal care for the birth of this child	
Prenatal check-ups Yes [__] No [__] Health Center [___] Hospital [___] Other: _____	
Has the prenatal card Yes [__] No [__] Early monitoring: Yes [__] No [__] Periodic: Yes [__] No [__]	
On the birth of the baby and its feeding at birth	
Where was the baby born? Hospital [___] Home [___] Other: _____	
Was the baby kept with you after it was born? Yes [__] No [__] Did you breast-feed? Yes [__] No [__]	
When was the first time you breast-fed the baby?	
Was something given to the baby before breast-feeding? Yes [__] No [__]	
What was given?	
Who gave the order? Health workers [___] Family member [__] Other:_____	
Why?	
At the hospital, did they give you any instructions for feeding your baby? Yes [__] No [__]	
What were they?	

Did they give you any food for the baby when you left the hospital?				Yes [__] No [__]
What did they give you?				
In addition to breast milk, did you give anything else to the baby when you left the Hospital?				Yes [__] No [__]
If you gave the baby something, what was it?				
Why did you give it?				
Monitoring the baby				
When was it the first time you took the baby for a check-up?				
Where did you take it?	Health services [__]		Healer [__]	Other: [_____]
Does the baby have a vaccination card?				Yes [__] No [__]
Vaccinations up to date?				Yes [__] No [__]
Do you have card for monitoring the baby's growth?				Yes [__] No [__]
Monitoring up to date?				Yes [__] No [__]
Family dynamic and the care of the baby				
Work Father	Yes [__] No [__]	Outside the home?	Yes [__] No [__]	Hours [_____]
Mother	Yes [__] No [__]	Outside the home?	Yes [__] No [__]	Hours [_____]
Do you have enough time to care for the baby? Yes [__] No [__]				
Why?				

	Who is in the home?	Who takes care of the baby?	Who feeds it?
Morning			
Noon			
Afternoon			
Night			

The medical consultation for the child
When did you take the child for a consultation?
Who took the child to the health service?
Why did they take the child to the health service?
At the health services, what did they say was wrong with the child?
At the health services, did they give him any medicine? (ask the mother to show you the drug(s) that were given) Yes [__] No [__]
On the treatment of the child
Why did the health workers your child this medicine(s)?
Did they tell you what each medicine was for? Yes [__] No [__]
What did they tell you they were for? 1. [_____] 2. [_____] 3. [_____] 4. [_____]

Did they explain how to give the medicine to the child? Yes [__] No [__]
How much of the medicine do you have to give him? 1. [_____] 2. [_____] 3. [_____] 4. [_____]
How many times a day do you have to give him each medicine? 1. [_____] 2. [_____] 3. [_____] 4. [_____]
For how many days do you have to give him each medicine? 1. [_____] 2. [_____] 3. [_____] 4. [_____]
Dosage: Adequate [____] Inadequate [____] Amount per dose: : Adequate [____] Inadequate [____]
Administration of the treatment to the child
Did they give you medicines for the child? Yes [__] No [__] Some [_____]
If they only gave you some medicines, what were they? 1. [_____] 2. [_____] 3. [_____] 4. [_____]
When did you first give him the medicines? 1. [_____] 2. [_____] 3. [_____] 4. [_____]
How much of each medicine did you give him? 1. [_____] 2. [_____] 3. [_____] 4. [_____]
How many times a day did you give each medicine? 1. [_____] 2. [_____] 3. [_____] 4. [_____]
For how many days did you give him the medicines? 1. [_____] 2. [_____] 3. [_____] 4. [_____]
Did he improve with the treatment? Yes [__] No [__]
Why?
Do you recall any day in which the medicine(s) could not be given to him? Yes [__] No [__]
Why couldn't they be given?
How many times did this happen? [____]
When did they give the medicine to the child for the last time? [_____]
Who gave it to him? [_____]
How much was given to him? Adequate [____] Inadequate [____]
Breast-feeding (only if the child is less than 2)
Are you breast-feeding your baby? Yes [___] No [___]
How many times a day? Adequate [__] Inadequate [__]
Do you breast-feed him at night? Yes [___] No [___]

Feeding
How are you feeding the child?
How many times a day? [_____] ? Adequate [__] Inadequate [__]
Administration of fluids to the child
Are you giving fluids to the child?
Adequate [__] Inadequate [__]
Signs of alarm surveillance in the child
Immediately take the child to the heath services when: Adequate [__] Inadequate [__]
Are you observing these signs? Yes [__] No [__]
Re-evaluation and follow-up consultation
When should you take the child to the health services to see if he is getting better?
When will you take him? Adequate [__] Inadequate [__]
When should you take the child to the health services to check-up on his growth?
Observations:

ANNEX 14.D
UNDERSTANDING OF AND COMPLIANCE WITH RECOMMENDATIONS FOR TREATMENT OF CHILDREN

INFORMATION CONSOLIDATION TABLE

Health Service/Area: _____ Period: _____

Study Group: _____

ASPECT	TOTAL	YES	NO	NO INFORMATION
Suggested indicators for observing the consultation				
The health workers achieved good communication with the mother at all times. The mother could express herself comfortably at all times. The health workers complemented information given to the mother by asking open questions. The health workers asked verification questions after giving prescriptions for treatment with medicine. The health workers asked about possible difficulties in following the prescriptions for treatment with medicine. The health workers gave instructions on breast-feeding.				
Suggested indicators for the interview with the mother upon leaving the consultation				
The mother had no doubts about which illness the child had. The mother explained correctly the purpose of each medicine given to her for the child. The mother explained correctly how much medicine she should give the child each time. The mother explained correctly how many times a day she should give the child each medicine.				

ASPECT	TOTAL	YES	NO	NO INFORMATION
Suggested indicators for the interview with the mother upon leaving the consultation (Cont.)				
The mother explained correctly how she should feed the child during the illness. The mother explained correctly when she should bring the child back for control of the current episode of illness. The mother explained correctly when she should bring the child back to be vaccinated (or for monitoring the child's growth).				
Suggested indicators for the interview with the mother in the home				
The child received the correct quantity of the prescribed medicines (or of one of them: _____). The child received the medicines indicated (or one of them) all the times recommended (number of times a day and number of days), at the time of the visit. The child is being fed correctly. The mother plans to return on the correct date for control of the current episode of illness. The mother plans to return on the correct date for immunization (or for growth monitoring).				
Suggested indicators based on review of registries in the health service				
The mother returned on the date indicated for the reevaluation and follow-up consultation. The mother returned on the date indicated for immunization (or for growth monitoring).				

PROTOCOL 15

IMCI STRATEGY IN DETERMINING CONSUMPTION PATTERNS AND EATING HABITS OF FAMILIES WITH CHILDREN AGED 2 MONTHS TO 5 YEARS

INTRODUCTION

The nutritional status of children is one of the most important factors that influence their current and future health situation. Nutrition affects not only the child's growth and development but also influences how they respond to disease. Nutritional problems, in addition to being among the leading causes of mortality in children under 5 in many developing countries, are primarily responsible for the greater incidence and severity of numerous infectious diseases, especially acute respiratory infections and diarrhea. These illnesses lead to further deterioration in nutritional status, a cycle that is highly detrimental to the overall health of the child.

Because of the extent and importance of children's nutritional problems, most developing countries consider nutritional problems to be a high priority and critical to achieving overall improvement in the situation of children's health. Control measures typically involve early detection of children who suffer some nutritional disorder and implementation of various actions to address the problem, including research on possible underlying causes (intestinal parasitic diseases, poor intestinal absorption, celiac disease, etc.), nutritional rehabilitation, and education to bring about changes in eating habits.

The first two actions seek to resolve the problem in the short term however, modification of eating habits is the only strategy sustainable over time. The feasibility of implementing this strategy as the basis for control of nutritional problems will vary depending upon the situation within the particular country. It is therefore useful to assess the current eating and consumption habits of the population, while identifying possible modifications that could help to improve their nutritional status.

OBJECTIVE

To determine the consumption patterns and eating habits of families with children from 2 months to 5 years of age.

METHODOLOGY

The population to be studied will consist of mothers of children aged 2 months to 5 years, who will be asked for information on the consumption patterns and eating habits of their families. The form in Annex 15.A, *Food Consumed by the Child in the Home*, will be used for this purpose. A person living in the home who knows how to read and write should complete the form, or if not, by an interviewer who visits on a daily basis.

Consumption patterns and eating habits can be studied in the population in general, or the population can be subdivided in order to make comparisons between different population groups. For example, consumption patterns and eating habits can be studied in families that have malnourished children aged 2 months to 5 years and in families whose children of that age are all well-

nourished; or the population can be disaggregated in relation to the degree of malnutrition (low weight for age, very low weight for age, and severe malnutrition), in relation to age, or in relation to the family's social or economic situation, using indicators of unmet basic needs and income.

Consumption patterns and eating habits can also be studied before and after implementation of the IMCI strategy in a health service in order to observe any changes that may occur and that can be attributed to implementation of the strategy. In this case, implementation of the IMCI strategy implies that:

- Health workers are trained in the theoretical and practical content needed for implementation of the strategy, preferably by having taken a clinical course in IMCI.

- The health services have the necessary supplies to carry out the recommendations for clinical assessment and treatment of children.

- Health workers have the opportunity to analyze problems and difficulties and raise questions about correct implementation of the IMCI strategy by means of follow-up visits after training and periodic supervision, both direct and indirect.

- The community using the health services has access to educational activities, both individual (before, during, and after the consultation) and in groups (through talks, meetings, and similar activities).

The IMCI strategy includes components aimed at improving the education of families with respect to care of children in the home. Implementation of these components can have an important influence on eating habits therefore, steps should be taken to ensure that the necessary emphasis is placed on education regarding proper feeding practices.

If the study is conducted in a population covered by more than one health service, one should make sure that the activities carried out in the selected services are similar, especially with respect to the education of families about child feeding practices.

The study includes both assessment of the child and assessment of the consumption patterns and eating habits of the family.

Assessment of the child will be carried out by applying the criteria for assessment, classification, and treatment contained in the IMCI strategy. The results of this assessment will be noted in the registry in use in the service or in a special registry, depending on the characteristics of the current registry (an effort should always be made to utilize the registry currently in use).

Consumption patterns and eating habits of the family will be evaluated using the form in Annex 15.A, *Food Consumed by the Child in the Home*, which will be filled in by the family or by an interviewer, depending on whether or not the family is able to do it.

A separate registry should be established for the nutritional classification that the child received in the assessment by the health workers, and for any other identification data for the child considered relevant for subdividing the population under study. This is done so that the chart given to the family for recording feedings will not include additional data that is not useful for them.

When the data is processed, the data recorded by the family in the chart for *Food Consumed by the Child in the Home* should be combined with the rest of the data.

The family's consumption patterns and eating habits will be assessed by considering the number of times the child is fed during each day for a complete week, the foods given to the child at each feeding, and the quantity of food. The assessment is qualitative, but incorporates some quantitative variables using ranges (a little, a moderate amount, a lot) in order to obtain more complete information about the quantity of food the child received.

It is advisable to have at least 100 families to serve as a base, but the number of children to assess should be adjusted depending upon the different subgroups for which one wants to analyze consumption patterns and eating habits. For example, these may be assessed in relation to the age of the child, or in relation to the child's nutritional status (malnourished or well-nourished). However the subgroups are defined, each of them should include at least 50 cases. The steps for calculating the size of the sample to study are described in Part II, Support Module for Statistical Methodology, in the section on research in which an estimate is made.

Consolidation of the data will be done in relation to the list of study variables that can be obtained from the information that the parents record on the chart. Some basic variables include:

- The number of meals a day the child has.
- The practice of exclusive or mixed breast-feeding.
- Consumption of meat or soybeans, and the weekly and daily frequencies.
- Consumption of milk, and the weekly and daily frequencies.

This information can be consolidated for each group into which the study population has been subdivided. The information can also be consolidated in relation to the quantities recorded as having been given to the child.

For consolidation of the information from the charts there is a model Information Consolidation Table in Annex 15.B.

The information from the table in Annex 15.B can be used to calculate various indicators referring to the eating habits and consumption patterns of the families whose children receive care at the health service. These indicators can focus on different aspects: consumption of energy-rich foods, of foods rich in iron and vitamins, of foods rich in protein, etc. The indicators that can be calculated will vary in relation to the data included in the Information Consolidation Table, in turn derived from the charts on *Food Consumed by the Child in the Home.*

Each indicator can be assessed in relation to the total number of children studied or in relation to subgroups defined by nutritional status. At the same time, each of these subgroups can be further differentiated according to the child's age, sex, race, nutritional status, or any other variable that one wishes to introduce.

Table 15.1 gives some examples of indicators to calculate, as well as formulas for calculating them. These indicators are presented only as examples; other ratios can also be calculated from the data in the Information Consolidation Table.

Table 15.1

INDICATOR	NUMERATOR	DENOMINATOR
Proportion of well-nourished children who receive 3 or more meals a day	Number of well-nourished children who receive 3 or more meals a day (YES box of the *Well-Nourished* column)	Total number of well-nourished children (sum of the YES box and the NO box of the *Well-Nourished* column)
Proportion of breast-feeding children who receive 3 or more meals a day (except for breast milk)	Number of breast-feeding children who receive 3 or more meals a day (except for breast milk)	Total number of breast-feeding children
Proportion of children with low weight for age who receive meat/soybeans or another source of protein 1 or more times a day	Number of children with low weight for age who receive meat/soybeans or another source of protein 1 or more times a day (YES box of the column *Malnourished: Low Weight for Age)*	Total number of children with low weight for age (sum of the YES box and the NO box of the column *Malnourished: Low Weight for Age)*
Proportion of children with very low weight for age who receive milk 2 or more times a day	Number of children with very low weight for age who receive milk 2 or more times a day (YES box of the column *Malnourished: Very Low Weight for Age)*	Total number of children with very low weight for age (sum of the YES box and the NO box of the column *Malnourished: Very Low Weight for Age*)
Average number of daily meals consumed by well-nourished children from 1 to 2 years of age	(No. of children from 1 to 2 years of age who receive 1 meal a day x 1) + (No. of children from 1 to 2 years of age who receive 2 meals a day x 2) + (No. of children from 1 to 2 years of age who receive 3 or more meals a day x 3)	No. of children from 1 to 2 years of age who receive 1 meal a day + No. of children from 1 to 2 years of age who receive 2 meals a day + No. of children from 1 to 2 years of age who receive 3 or more meals a day
Average number of times a week that children from 2 to 4 years of age eat meat, soybeans, or another source of protein	(No. of children from 2 to 4 years of age who eat meat, soybeans, or another source of protein 9 or more times a week x 9) + (No. of children from 2 to 4 years of age who eat meat, soybeans, or another source of protein 8 times a week x 8) + …+ (No. of children from 2 to 4 years of age who eat meat, soybeans, or another source of protein once a week x 1)	No. of children from 2 to 4 years of age who eat meat, soybeans, or another source of protein 9 or more times a week + No. of children from 2 to 4 years of age who eat meat, soybeans, or another source of protein 8 times a week + …+ No. of children from 2 to 4 years of age who eat meat, soybeans, or another source of protein once a week

ANNEX 15.A
FOOD CONSUMED BY THE CHILD IN THE HOME

CHART FOR THE FAMILY

Identification of the family: _____

What did the child eat?	In the morning	At lunch	In the afternoon	In the evening
Yesterday				
Today				
Day 1				
Day 2				
Day 3				
Day 4				
Day 5				
Day 6				

Observations:

Instructions for filling in the chart on Food Consumed by the Child in the Home:

The chart for recording the food consumed by the child in the home has the following parts:

➢ A section for entering the identification data that make it possible later to link the chart to the classification assigned to the child by the health services.

➢ The central part of the chart, divided as follows:

- Column 1 is for noting the days of the week for which food given to the child will be recorded. If the chart is to be completed by the family, it is advisable to write the days in the chart before giving it to the family, using the terms most easily understood.

- Columns 2 to 5 are for recording the food given to the child during each part of the day. If the chart is to be completed by the family, it is helpful to define with them what is meant by each part of the day. For this purpose, the following division is suggested:

  - Morning is the part of the day between the time when the child wakes up and lunch.
  - Lunch is the meal that the child receives at midday (use the most appropriate local term).
  - Afternoon is the part of the day between the end of lunch and the evening meal.
  - Evening is the part of the day between the evening meal and the time the child falls asleep (here, also, use the most appropriate local terms).
  - If an interviewer completes the chart, the terms above should be used for explanations to the family during the interview.

➢ The last part of the chart is for writing any additional information.

In column 1 of the chart, note the days of the week on which to record the food given the child.

In each of the sections reserved for the family to record food given to the child, there should be noted:

- The names of the foods: meat, fish, vegetable, etc. If other terms for food are used, for example, soup, it should be made clear whether it contains vegetables, egg, meat, etc.

- The quantity of each food given to the child, indicated by x's: (x) a little; (xx) a moderate amount; (xxx) a lot.

If the child does not receive some of the meals, this should be noted, for example by crossing out the box corresponding to the missed meal with a diagonal line. This will avoid confusion about the meaning of blank boxes.

All the food the child consumes should be noted in the chart. This includes not only what are normally called "meals," but also other foods that the child may consume at certain times of the day (morning, afternoon, evening): for example, fruit, bread, cookies, milk, caramels or other candies, etc.

If the chart is to be left with the family, it is advisable first to complete row 1 of the chart with them, showing the food given to the child during the previous day (**Yesterday**) and during the same day up to the time of the consultation (**Today**). This will help to ensure that the family records all the food the child receives, according to agreed-on criteria, and that they understand how to fill in the chart over the next six days.

It may be necessary to schedule a follow-up consultation half-way through the period, to check on how the chart is being completed. This can be done either through a home visit or, if feasible, through a visit to the health service. Other questions that arise can also be dealt with at this time.

Es conveniente analizar con la familia la posibilidad de realizar una consulta de control del llenado de la ficha a mitad del período, ya sea mediante una visita al domicilio o, si resulta factible, mediante una visita al servicio de salud. De este modo, podrán aclararse dudas adicionales que se pueden presentar.

ANNEX 15.B
CONSUMPTION PATTERNS AND HABITS OF FAMILIES WITH CHILDREN AGED 2 MONTHS TO 5 YEARS
INFORMATION CONSOLIDATION TABLE - FRONT

Area/Health Service: _____ Period (Month and Year): _____ Age Group: _____

ASPECT	TOTAL		WELL-NOURISHED		MALNOURISHED					
	YES	NO	YES	NO	Low weight for age		Very low weight at birth		Severe malnutrition	
					YES	NO	YES	NO	YES	NO
Receives 3 or more meals a day										
Receives 1 meal a day										
Receives 2 meals a day										
Receives meat, soybeans, or another source of protein 1 or more times a day										
Receives milk 2 or more times a day										
TOTAL										

Observations:

CONSUMPTION PATTERNS AND HABITS OF FAMILIES WITH CHILDREN AGED 2 MONTHS TO 5 YEARS
INFORMATION CONSOLIDATION TABLE - BACK

ASPECT	TOTAL		WELL-NOURISHED		MALNOURISHED					
	YES	NO	YES	NO	Low weight for age		Very low wight for age		Severe malnutrition	
					YEAS	NO	YES	NO	YES	NO
Number of times a week the child receives meat, soybeans, or another source of protein 9 or more times										
9 o más veces										
8 times										
7 times										
6 times										
5 times										
4 times										
3 times										
2 times										
1 time										
TOTAL										

Observations:

Instructions for completing the Information Consolidation Table:

1. On the front side of the Information Consolidation Table, in the upper portion, fill in the data identifying the area or health service where the study was conducted and the period corresponding to the information to be processed. Include any additional information that is necessary for consolidation of the information. If the data is to be processed for different age groups, complete a separate Information Consolidation Table for each of these subgroups: for example, children from 2 to 4 months or 2 to 6 months (to assess practices of exclusive breast-feeding), from 6 months to 1 year and from 1 to 2 years (to assess complementary breast-feeding), from 2 to 4 years, etc.

2. Complete column 1 of the table, including all the other indicators that are of interest to assess. Three indicators are included in the table. Each of them can be disaggregated by the quantity of food that the child receives; for example "receives 3 or more ample meals a day" (when three x's are marked in at least 3 periods of the day on the family chart), etc. Add all the other indicators that are going to be assessed, depending on the kinds of foods that are available locally and that are recommended by the IMCI strategy, such as cereals, eggs, juices, fruits, etc. If the IMCI strategy has recommended including in the child's diet some foods that are not normally given, it may be useful to assess whether or not the foods in question are used by the parents before and after implementation of the strategy.

3. Select the group of charts corresponding to the area or health service for the Information Consolidation Table. Review the charts in order to confirm that the relevant information has been entered in the appropriate boxes or that the correct markings (as agreed beforehand) have been used to indicate that the child did not receive any food. Put aside any charts with blank boxes, since these are considered incomplete.

4. For each child that has a chart, find the nutritional classification assigned to the child by health workers. Indicate in the upper right-hand part of the chart whether the child is well-nourished (WN), is low weight for age (LW), is very low weight for age (VLW), or has severe malnutrition (SM).

5. Then select the first chart and check whether the child meets each condition included in column 1 of the Information Consolidation Table. For example, check in the chart whether or not the child received 3 or more meals a day; whether the child received meat, soybeans, or another source of protein at least once a day; whether the child received milk 2 or more times a day, etc.

6. Each time it is found that the child named in the first chart meets one of the conditions, make a mark (|) in the "YES" column for that condition. If the child does not meet that condition, make a mark in the "NO" column. Once the review of all the conditions included in column 1 of the Information Consolidation Table has been completed, make a mark on the chart to record that it has been tabulated in the Information Consolidation Table and select another chart.

7. Repeat the same procedure for the next chart, until all the charts have been completed.

8. Once the information has been recorded for all the files, count the marks (|) in each box and write the resulting number in the same box. Then add up the boxes of all the columns belonging to a single row and note the result in the box corresponding to the **Total.**

9. Finally, count the number of charts for each type of nutritional classification (WN, LW, VLW, and SM) and place the results in the corresponding boxes of the **Total** row (last row of the table).

PART V

STUDIES TO EVALUATE IMPLEMENTATION OF THE IMCI STRATEGY BY HEALTH WORKERS

PROTOCOL 16

IMPACT OF THE IMCI STRATEGY ON THE USE OF X-RAYS FOR THE DIAGNOSIS OF ACUTE RESPIRATORY INFECTIONS

INTRODUCTION

Radiology is a widely used diagnostic procedure for the study of children with acute respiratory infections (ARI). In most countries, it is customary for children under 5 who have had episodes of ARI to have two or more x-rays requested for each episode. In many of these cases, the clinical picture does indeed warrant the radiology request; in others, however, an excessive number of plates are ordered during the course of the disease.

Excessive use of chest x-rays for the diagnosis of ARI is a significant problem because of the danger of frequent irradiation of the child with X-rays; it also increases the costs of care.

Implementation of the IMCI strategy diminishes the use of x-rays for diagnosis by making it possible to determine which children with ARI might have pneumonia, and, of these, which require hospital treatment (severe pneumonia) and which can be treated with antibiotics on an outpatient basis (pneumonia).

A study of the proportion of ARI cases for whom x-rays were indicated in their diagnosis before and after applying the IMCI strategy makes it possible to measure the impact of the IMCI strategy on the use of radiology. Changes in the use of radiology can be verified most rapidly in the outpatient clinic services of hospitals, since these are the ones best placed to use this diagnostic method.

OBJECTIVE

Determine the impact of effective implementation of the IMCI strategy on the use of chest x-rays for diagnosis of ARI cases in general and pneumonia in particular.

METHODOLOGY

In order to measure the proposed objective, it is necessary to observe the proportion of cases of children under 5 with a diagnosis of ARI for whom radiology services were requested, before and after implementation of the IMCI strategy in the selected health services.

Effective implementation of the IMCI strategy implies that:

- The health services personnel have been trained in the theoretical and practical implementation of the strategy, preferably having attended an IMCI clinical course.

- The health services where the trained staff works have the necessary supplies to implement the recommendations for the assessment and treatment of the children.

- The health workers are able to analyze problems, difficulties, and questions concerning the correct implementation of the IMCI strategy, through follow-up visits after training, and periodic supervision, both directly and indirectly.

- The community attending the health services has access to educational activities, both on a personal level during, before, or after consultation, and in groups through talks, meetings, and similar activities.

Implementation of the IMCI strategy should ensure the systematic implementation of the steps prescribed for the assessment, classification, and treatment of children under 5 who visit the health services.

The target population of the study consists of children under 5 diagnosed with ARI who visit the health services where the study is conducted.

In order to calculate the size of the sample to be studied and the length of the observation period it is necessary to consider the situation of the problem prior to (or at the beginning of) implementation of the strategy, and the expected impact. The steps for calculating the sample size for the study are described in the Part II, the Statistical Methodology Support Module, with regard to Studies to Compare the Situation Before and After Implementation of the IMCI strategy.

Health services (preferably the hospital outpatient clinic) should be selected; a determination should be made of the proportion of cases with a diagnosis of ARI attended (diagnoses of pneumonia, bronchitis, bronchiolitis, and flu may also be differentiated) for which chest x-rays were indicated, before and after effective implementation of the standard case management strategy.

The source for acquisition of the data will be the patient medical records or medical log, and should include the following data:

- Age of the child
- Diagnosis
- Complementary examinations
- Treatment

The age of the child is usually recorded in the medical record or log. Care should be taken to record the age of the child in months and years, in order to be able to study the group of nursing infants less than two months of age.

Usually the physician records the diagnosis in the medical record.. If different nomenclature is used for a single pathology, a few referral diagnoses should be selected in order to code the information. The diagnoses of the International Classification of Diseases can be used for this, or a group can be defined for the purpose.

Additional tests and treatment are not always included in the records. In these cases, it will be necessary to rely on other information sources, or to amend the medical record so it includes complementary examinations and treatment.

The information in the medical record should be tabulated to obtain data on the number of chest x-rays indications for ARI cases according to the diagnosis. This information should be obtained for the different age groups that are selected.

This processing should in turn be conducted in two different months (or within a shorter period if there is a large number of consultations for ARI), before and after applying the standard case management strategy.

Annex 16.A presents a model Worksheet for Collection of Information based on the registries of the outpatient services.

Annex 16.B presents a model Table for Consolidation of the Information, followed by instructions to register the data. The indicators for indication of chest x-rays can be calculated from the information from the Table (Table 16.1) for each type of diagnosis that has been formulated.

In order to calculate the indicators shown below, cases that did not specify whether chest x-rays were requested should be ruled out. To do this, subtract the numbers the fifth column (**Without Specifying Whether Chest X-ray was Indicated**) from the numbers in the second column (**Total Cases Attended**). The numbers thus obtained will be used as the denominator.

Table 16.1

INDICATOR	NUMERATOR	DENOMINATOR
Proportion of ARI cases for which chest x-rays were requested, out of all cases of ARI attended	Total number of ARI cases with chest x-rays indication	Total number of ARI cases attended
Proportion of cases of pneumonia for chest x-rays were requested, out of all cases of pneumonia attended	Number of pneumonia cases with chest x-rays indication	Total number of pneumonia cases attended
Proportion of cases of bronchitis for which chest x-rays were requested out of all cases of bronchitis attended	Number of bronchitis cases with chest x-rays indication	Total number of bronchitis cases attended
Proportion of cases with a diagnosis of No Pneumonia for which chest x-rays were requested out of all cases of No Pneumonia attended	Number of cases of bronchitis, bronchiolitis, flu, and other ARI with chest x-rays indication	Total number of cases of bronchitis, bronchiolitis, flu, and other ARI attended

Finally a hypothesis test should be conducted for the indicators that were selected, in order to discover whether implementation of the strategy produced changes in the components being studied. In order to calculate this test please refer to the Part II, the Statistical Methodology Support Module.

ANNEX 16.A
USE OF CHEST X-RAYS FOR DIAGNOSIS OF CASES OF ACUTE RESPIRATORY INFECTION

DATA COLLECTION WORKSHEET

Health Services: _____ Period/Year: _____

No	SURNAME AND NAME	AGE	DIAGNOSTIC	WITH CHEST X-RAY	WITHOUT CHEST X-RAY	WITHOUT SPECIFYING CHEST X-RAY

Observations:

ANNEX 16.B
USE OF CHEST X-RAYS FOR THE DIAGNOSIS OF CASES OF ACUTE RESPIRATORY INFECTION

TABLE FOR CONSOLIDATION OF THE INFORMATION

Health Services: _____ Period/Year: _____

Age Group: _____

DIAGNOSIS	TOTAL CASES ATTENDED	WITH INDICATION OF CHEST X-RAY	WITHOUT INDICATION OF CHEST X-RAY	WITHOUT SPECIFYING CHEST X-RAY
TOTAL ARI CASES				
PNEUMONIA				
BRONCHITIS				
BRONCHIOLITIS				
FLU				
OTHER ARI				

OBSERVATIONS:

To Fill out the Data Collection Worksheet:

1. Fill out the top part of the Worksheet, writing in the appropriate name of the health services and the period (week, month, months; year) for the information to be registered.

2. Select the appropriate Daily log or medical records for the first day of the period to be studied.

3. Review the Registry until finding the first case of ARI in a child under 5 in the selected period.

4. Record the data from the Worksheet: surname and name, age, diagnosis, and with regard to the request for a chest x-ray: whether it was indicated, not indicated, or not specified.

To Fill out the Table for Consolidation of the Information:

1. Fill out the top part of the Table, writing in the name of the health services, the period (week, month, months; and the year) for the information that will be tabulated and the age group (children under 1 year, from 1 to 4 years, or other groups if so desired). A table should be used for each age group to be considered.

2. Based on the Worksheet for Collection of the Information continue with the following steps. Based on the age, select the appropriate Table.

3. Identify the diagnosis registered by the physician and select the appropriate row of the Table. Then, mark (|) the second column (**Total Cases Attended**) of the row selected.

   3.1. If a chest x-ray was requested, mark (|) the third column (**With Indication of Chest X-ray**) of the appropriate row for the diagnosis of the case.

   3.2. If a chest x-ray was not requested, regardless of the diagnosis registered, mark (|) the fourth column (**Without Indication of Chest X-ray**).

   3.3. If it was not specified whether chest x-rays were requested, mark (|) the fifth column (**Without Specifying if Chest X-ray Was Indicated**).

4. Having completed the review of the Worksheets for Collection of the Information for the entire period selected, the number of marks (|) in each box of the Table should be added and the sum recorded.

5. Total the numbers in all the boxes of each column to obtain the figures for the second row (**Total ARI Cases**).

PROTOCOL 17

IMPACT OF THE IMCI STRATEGY ON THE USE OF LABORATORY TESTS FOR THE DIAGNOSIS OF DIARRHEAL DISEASES

INTRODUCTION

The assessment, classification, and management of diarrheal disease in children under 5 who visit the health services can be done at the primary level of care without need for additional studies, however in many health services it is common to request laboratory tests. In some cases these examinations are conducted to identify the presence of parasites, in order to prescribe the specific treatment; in other cases, cultures are requested for the identification of other infectious agents, typically bacteria.

The etiological diagnosis of diarrhea is not recommended as a routine technique in the proposed standards for case management by PAHO/WHO, since it is generally unnecessary for treatment of most cases that visit the health services. The case management standards set criteria for the administration of antibiotics in cases of diarrhea, based on the presence of blood in the stool, which is associated with invasive diarrhea (dysentery). In the remaining cases, identification of the etiology of diarrhea is not required for the treatment decision since this will always include the administration of oral rehydration solution to prevent the dehydration of the child.

Even when a bacteriological study is conducted, should be no delay in treatment; it should start at once, without waiting for the results; by the time these results become available, the progress of the condition will have usually already determined the child's treatment. If there has not been positive progress, the case should already have been referred.

Thus, in most situations, the implementation of bacteriological studies for cases of diarrhea does not yield any additional benefit for the treatment of the child, but rather leads to operational complications and increases the costs of care.

A study of the proportion of the cases of diarrhea for which laboratory tests were indicated before and after applying the IMCI strategy makes it possible to measure the impact of the strategy on the use of this diagnostic technology. Modifications in the use of the laboratory for the etiological diagnosis of cases of diarrhea can be confirmed most rapidly in the hospital outpatient clinic services, since these services have more immediate access to laboratory facilities, and are more likely to use this diagnostic method.

OBJECTIVE

Determine the impact of the effective implementation of the IMCI strategy on laboratory use for the etiological diagnosis of cases of diarrhea.

METHODOLOGY

In order to measure the proposed objective, the proportion of cases of children under 5 with a diagnosis of diarrhea for whom laboratory studies were requested should be observed, before and after implementation of the IMCI strategy in the selected health services.

The effective implementation of the IMCI strategy implies that:

- The health services personnel have been trained in the theoretical and practical implementation of the strategy, preferably having attended an IMCI clinical course.

- The health services where the trained staff works have the necessary supplies to implement the recommendations for the assessment and treatment of the children.

- The health workers are able to analyze problems, difficulties, and questions concerning the correct implementation of the IMCI strategy, through follow-up visits after training, and periodic supervision, both directly and indirectly.

- The community attending the health services have access to educational activities, both personally during, before, or after consultation, and in groups through talks, meetings, and similar activities.

Implementation of the IMCI strategy should ensure the systematic implementation of the steps prescribed for the assessment, classification, and treatment of children under 5 who visit the health services.

The target population of the study is children under 5 with a diagnosis of diarrhea that visit the health services where the study is being conducted.

In order to calculate the sample size and the length of the observation period it is necessary to consider the situation of the problem prior to (or at the beginning of) implementation of the strategy, and the expected impact. The steps for calculating the sample size for the study are described in the Part II, the Statistical Methodology Support Module, with regard to Studies to Compare the Situation Before and After Implementation of the IMCI strategy.

Health services (preferred an outpatient clinic of hospital) should be selected and a determination made of the proportion of cases attended with a diagnosis of diarrhea and for whom a stool culture was prescribed before and after effective implementation of the IMCI strategy.

The source for acquisition of the data will be the patient medical record or the clinic daily log obtained at the health service, and should include the following data:

- Age of the child
- Diagnosis
- Complementary laboratory tests
- Treatment

The age of the child is usually recorded in the consultation registry. Care should be taken to record the age of the child in months and years, if the intent is to break down cases within the group of children under 5 into different subgroups.

Usually the physician records the diagnosis in the medical record. Ordinarily differing nomenclature for diarrhea are not used, but if this should be the case, the classification should be defined, taking into account what meaning the health workers assign to each nomenclature.

Additional examination and treatment are sometimes not included in the medical record or the daily log . In such cases, it will be necessary to rely on other information sources, or to amend the registry so it includes additional exams and treatment.

Another way to obtain data on cases where laboratory tests were requested involves using the *laboratory slips or registries*, but it should be remembered that this will involve a double search for the information. An approximation could be obtained by using the total number of cases of diarrhea identified in summary of care; and the number of laboratory tests registered during the same period.

The information on the patient medical log should be tabulated in order to obtain data on the number of laboratory test prescriptions for cases of diarrhea. This information, in turn, should be obtained for the different age groups that are selected.

This processing should be conducted in two separate months (or within a shorter period if the number of consultations for diarrhea it is elevated), before and after applying the IMCI strategy.

Annex 17.A presents a model Worksheet for Collection of Information based on the registries of the outpatient services.

Annex 17.B presents a model Table for Consolidation of the Information, followed by instructions. The indicators on the prescription of laboratory tests for each type of diagnosis formulated can be calculated from the information in the Table (Table 17.1).

In order to calculate the indicators that occur below, cases that did not specify whether a stool culture exam was requested should be ruled out. To do this, subtract the numbers in the fifth column (**Without Specifying if a Laboratory Test was Prescribed**) from the numbers in the second column (**Total Cases Attended**). The result of the subtraction will be used as the denominator.

Table 17.1

INDICATOR	NUMERATOR	DENOMINATOR
Proportion of cases of diarrhea for which a laboratory test was requested out of all cases of diarrhea	Total number of cases of diarrhea for which a laboratory test was prescribed	Total number of cases of diarrhea cared for
Proportion of cases of acute diarrhea for which a laboratory test was requested out of all cases of acute diarrhea cared for	Number of cases of acute diarrhea for which a laboratory test was prescribed	Total number of cases of acute diarrhea cared for
Proportion of cases of persistent diarrhea for which a laboratory test was requested out of all cases of persistent diarrhea cared for	Number of cases of persistent diarrhea for which a laboratory test was prescribed	Total number of cases of persistent diarrhea cared for
Proportion of cases of dysentery for which a laboratory test was requested out of all cases of dysentery	Number of cases of dysentery for which a laboratory test was prescribed	Total number of cases of dysentery cared for

Finally a hypothesis test should be conducted for the indicators that were selected, in order to discover whether implementation of the strategy produced changes in the components being studied. In order to calculate this test please refer to the Part II, the Statistical Methodology Support Module.

ANNEX 17.A
USE OF LABORATORIES FOR THE DIAGNOSIS OF DIARRHEA IN CHILDREN UNDER 5

DATA COLLECTION WORKSHEET

Health Services: _____ Period/Year: _____

No.	SURNAME AND NAME	AGE	DIAGNOSIS	WITH STOOL CULTURE	WITHOUT STOOL CULTURE	WITHOUT SPECIFYING STOOL CULTURE

Observations:

ANNEX 17.B
USE OF LABORATORIES FOR THE DIAGNOSIS OF DIARRHEA IN CHILDREN UNDER 5

TABLE FOR CONSOLIDATION OF THE INFORMATION

Health Services: _____ Period/Year: _____

Age Group: _____

DIAGNOSIS	TOTAL CASES ATTENDED	WITH PRESCRIPTION OF LABORATORY TESTS	WITHOUT PRESCRIPTION OF LABORATORY TESTS	WITHOUT SPECIFYING PRESCRIPTION OF LABORATORY TESTS
TOTAL CASES OF DIARRHEA				
ACUTE DIARRHEA				
DYSENTERY				
PERSISTENT DIARRHEA				
OTHER DIARRHEA DIAGNOSES				

Observations:

To Fill out the Data Collection Worksheet:

1. Fill out the top part of the Worksheet, writing in the name of the health services and the period (week, month, months; and the year) pertaining to the information to be registered.

2. Select the appropriate Daily Registry of Consultations for the first day of the period that will be studied.

3. Review the Registry until finding the first case of diarrhea in a child under 5 in the selected period.

4. Record the data from the Worksheet: surname and name, age, diagnosis, and with regard to the request for a stool culture: whether it was indicated, or not indicated, or it is not specified.

To Fill out the Table for Consolidation of the Information:

1. Fill out the top part of the Table for Consolidation of the Information, writing in the name of the health services, the period (week, month, months; and year) pertaining to the information that will be tabulated and the age group (children under 1 year and from 1 to 4 years, or other groups if so desired). A Table should be used for each age group that one wishes to consider.

2. Based on the Worksheet for Collection of the Information continue with the following steps. Based on the age, select the appropriate Table.

3. Identify the diagnosis noted by the physician and select the appropriate row of the Table. Then, mark (|) the second column (**Total Cases Served**) of the row selected.

    3.1. If a stool culture was requested, mark (|) the third column (**With Indication of Laboratory Test**) of the row pertaining to the diagnosis of the case.

    3.2. If a stool culture was not requested, regardless of the treatment indicated, mark (|) the fourth column (**Without Indication of Laboratory Test**).

    3.3. If it is not specified whether the examination of stool culture was prescribed, mark (|) the fifth column (**Without Specifying Whether a Laboratory Test Was Prescribed**).

4. Having completed the review of the appropriate Worksheet for Collection of the Information for all the selected period, total the number of marks (|) in all boxes of the Table and write the resulting number in each.

5. Total the numbers contained in all the boxes for each column to obtain the figures that correspond to the second row (**Total Cases of Diarrhea**).

PROTOCOL 18

IMPACT OF THE IMCI STRATEGY ON THE USE OF COUGH MEDICINES AND OTHER DRUGS FOR SYMPTOMATIC TREATMENT OF ARI

INTRODUCTION

Most children with ARI who visit the health services have viral infections that are manifested with a cough and do not appear to be severe. The average duration of these cough or cold episodes is from 7 to 9 days. The primary health care service devotes considerable time to caring for children with coughs or colds, and whose relatives demand medication. It is common for these children to receive a wide variety of drugs prescribed by a health worker or the family itself, with the intention of relieving the symptoms.

It has been demonstrated that many of the drugs used to soothe symptoms of acute respiratory infections (cough, nasal congestion, sore throat) are not effective, or the literature has been reviewed and there is no proof whatsoever that they have been studied in controlled experiments. Neither is there data in the medical literature to show that administering these drugs for treatment of the symptoms prevents worsening of the respiratory infections. To the contrary, administering drugs that are ineffective or of unknown effectiveness to children under 5 can induce significant undesirable effects.

Some cough suppressant (for example codeine), locally or orally administered nasal decongestants (sympathomimetic drugs), and throat analgesics, are effective, but invariably they all produce significant toxic side effects in children under 5 and cannot be recommended. In fact, many hospital admissions of children are for toxic side effects of cough and cold drugs.

The recommendations of PAHO/WHO on good home care do not include the administration of over-the-counter drugs for the treatment of coughs and colds. In fact, the recommendations emphatically point out the following care that can be provided in the home by the child's mother and relatives:

- Continue to feed the child to prevent weight loss.
- Increase the amount of fluids provided in order to prevent dehydration.
- Continue breastfeeding.
- Keep the child's nose clean using salt water to dissolve the secretion if necessary.
- Soothe the throat and relieve the cough with harmless and simple remedies.
- Watch for warning signs.

Implementation of the IMCI strategy substantially reduces the use of commercial drugs for coughs and colds, with attendant benefits for the health of the child, and reducing the costs of care. The decline in the use of drugs for coughs and colds can be assessed by analyzing the proportion of ARI cases that receive this type of drugs before and after implementation of the IMCI strategy.

OBJECTIVE

Determine the impact of the effective implementation of the IMCI strategy on the use of drugs for coughs and colds for the management of ARI cases in general and, in particular, of cases classified as *No Pneumonia: Cough and Cold*.

METHODOLOGY

In order to measure the proposed objective, the proportion of cases of children under 5 with diagnosis of ARI that were treated with cough and cold drugs should be observed before and after implementation of the IMCI strategy in the selected health services.

The effective implementation of the IMCI strategy implies that:

- The health services personnel have been trained in the theoretical and practical implementation of the strategy, preferably having attended an IMCI clinical course.

- The health services where the trained staff works have the necessary supplies to implement the recommendations for the assessment and treatment of the children.

- The health workers are able to analyze problems, difficulties, and questions concerning the correct implementation of the IMCI strategy, through follow-up visits after training, and periodic supervision, both directly and indirectly.

- The community attending the health services has access to educational activities, both personally during, before, or after consultation, and in groups through talks, meetings, and similar activities.

Implementation of the IMCI strategy should ensure the systematic implementation of the steps prescribed for the assessment, classification, and treatment of children under 5 who visit the health services.

The target population of the study are children under 5 years with a diagnosis of ARI that visit the health services in which the study is being conducted.

In order to calculate the size of the sample to be studied and the length of the observation period it is necessary to consider the situation of the problem prior to (or at the beginning of) implementation of the strategy, and the expected impact. The steps for calculating the sample size for the study are described in the Part II, the Statistical Methodology Support Module, with regard to Studies to Compare the Situation Before and After Implementation of the IMCI strategy.

One or more health services will be selected and the proportion will be determined of cases with a diagnosis of ARI (differentiating the diagnoses of No Pneumonia: Cough or Cold, pharyngitis, flu) cared for, for whom drugs were indicated for the treatment of symptoms, before and after effective implementation of the IMCI strategy.

The source for acquisition of the data will be the medical record or clinic daily log and should include the following data:

- Age of the child
- Diagnosis
- Treatment

The age of the child is usually recorded in the consultation rccord. Care should be taken to record the age of the child in months and years, in order to be able to study nursing infants from aged 1 week to 2 months.

Usually the physician records the diagnosis in the consultation record. If different nomenclature is used for a single pathology, a few referral diagnoses should be selected in order to code the information. The diagnoses of the International Classification of Diseases can be used for this, or a group can be defined for the purpose.

Additional exam and treatment are not always included in the Daily log or medical record. In these cases, it will be necessary to rely on other information sources, or to amend the registry so that it includes the treatment. Ensure that the indication of the type of cough and cold meds be written on the daily consultation registry.

It should be determined what types of drugs are included within this category and if they will be analyzed together or separately. The Table in Annex 18.A considers three types of drugs: cough suppressants, expectorants, and mucolytic compounds.

Information of the most common brand and generic drug names should be prepared in order to identify the drugs that will be considered. The information on the log should be tabulated in order to obtain data on the number of indications of these drugs for ARI cases, by diagnosis. This information, in turn, should be obtained for the different age groups that were selected. This processing should be conducted in two different months (or within a shorter period if the number of consultations for ARI it is elevated), before and after applying the IMCI strategy.

Annex 18.A presents a model Table for Collection and Consolidation of the Information on each disease, followed by the instructions to fill it out.

The information from the Table can be used to calculate the indicators (Table 18.1) the indication of drugs for coughs and colds (cough suppressants, expectorants, mucolytics) for treatment of each type of formulated diagnosis. Other indicators can be calculated based on the examples of Table 18.1.

In order to calculate these indicators, cases in which the prescribed treatment was not specified should be ruled out. To do this, subtract the numbers from the seventh column (**Without Specifying Treatment**) from the numbers in the second column (**Total cases Attended**). The result of the subtraction will be used as the denominator.

Finally a hypothesis test should be conducted for the indicators that were selected in order to find whether implementation of the strategy produced changes in the components being studied. In order to calculate this test please refer to the Part II, the Statistical Methodology Support Module.

If the proportion of cases in which the treatment is not specified is very high (more than 40%), the results of the study may be of little value.

Table 18.1

INDICATOR	NUMERATOR	DENOMINATOR
Proportion of ARI cases that were treated with drugs for coughs and colds out of all cases ARI cases	Total number of ARI cases with indication of drugs for coughs and colds	Total number of ARI cases attended
Proportion of cases with Cough or Cold that were treated with cough suppressant out of all the cases of Cough or Cold cared for	Number of cases of Cough or Cold with indication of cough suppressant	Total number of cases of Cough and Cold cared for
Proportion of cases with Cough or Cold that were treated with expectorants out of all cases of Cough or Cold cared for	Number of cases of Cough or Cold with indication of expectorant	Total number of cases of Cough or Cold cared for
Proportion of cases with Cough or Cold that were treated with mucolytic out of all cases with Cough or Cold cared for	Number of cases of Cough or Cold with indication of mucolytic	Total number of cases of Cough or Cold cared for

ANNEX 18.A
USE OF DRUGS FOR COUGHS AND COLDS
TABLE FOR COLLECTION AND CONSOLIDATION OF THE INFORMATION

Health Services: _____ Period/Year: _____
Age Group: _____

DIAGNOSIS	TOTAL CASES ATTENDED	WITH INDICATION OF COUGH SUPRESSANT	WITH INDICATION OF EXPECTORANT	WITH INDICATION OF MUCOLYTIC	OTHER TREATMENTS	WITHOUT SPECIFYING TREATMENT
TOTAL CASES OF ARI						
COUGH OR COLD						
BRONCHITIS						
FLU						
STREPTOCOCCAL PHARYNGITIS						
OTHER ARI						

Observations:

To Fill out the Table for Collection and Consolidation of the Information:

1. Fill out the top part of the Table, writing in the name of the health services, the period (week, month, months; and the year) pertaining to the information that will be tabulated and the age group (child under 1 year and from 1 to 4 years, or other groups if so desired). A Table should be used for each age group that one wishes to consider.

2. Select the appropriate log or medical record for the first day of the period under study.

3. Review the Daily log selected until finding the first case of ARI in a child under 5. Based on the age, select the Table pertaining to the group.

4. Identify the diagnosis registered by the physician and select the appropriate row of the Table. Then, mark (|) the second column (**Total cases Attended**) of the row selected.

5. Identify the treatment and behavior as follows:

   5.1. If a drug was prescribed for the cough, mark (|) the third column (**With Indication of cough suppressant**) of the row pertaining to the diagnosis of the case.

   5.2. If an expectorant drug was prescribed, mark (|) the fourth column (**With Indication of Expectorant**) of the row pertaining to the diagnosis of the case.

   5.3. If a mucolytic compound was indicated, mark (|) the fifth column (**With Indication of Mucolytic**) of the row pertaining to the diagnosis of the case.

   5.4. If none of the above drugs were indicated, for any other drug that was indicated for treatment, mark (|) the sixth column (**Other Treatments**).

   5.5. If the prescribed treatment was not specified, mark (|) the seventh column (**Without Specifying Treatment**).

6. Having reviewed the appropriate daily consultation registries for all the selected period, the number of marks (|) in each box of the Table should be added, and the sum in each one recorded.

7. Total the numbers in all the boxes of each column to obtain the figures for the second row (**Total ARI cases**).

PROTOCOL 19

IMPACT OF THE IMCI STRATEGY ON THE USE OF ANTISPASMODIC DRUGS,ANTIDIARRHEAL COMPOUNDS, AND OTHER DRUGS FOR THE TREATMENT OF DIARRHEA

INTRODUCTION

Just as many children with ARI receive unnecessary drugs for their treatment, a significant proportion of children with diarrhea receive a variety of drugs, given by health workers or by their family, that are not effective.

Current research clearly shows that the use of antispasmodic drugs, antiemetics, and a range of antidiarrheal medication are unnecessary. In some cases, those drugs can even be detrimental in the management of children with diarrhea.

OBJECTIVE

Determine the impact of effective implementation of the IMCI strategy with regard to the use of antidiarrheal medication.

METHODOLOGY

In order to measure the proposed objective, the proportion of cases of children under 5 with a diagnosis of diarrhea who received antidiarrheal medication should be observed, before and after implementation of the IMCI strategy in the selected health services.

The effective implementation of the IMCI strategy implies that:

- The health services personnel have been trained in the theoretical and practical implementation of the strategy, preferably having attended an IMCI clinical course.

- The health services where the trained staff works have the necessary supplies to implement the recommendations for the assessment and treatment of children.

- The health workers are able to analyze problems, difficulties, and questions concerning the correct implementation of the IMCI strategy, through follow-up visits after training, and periodic supervision, both directly and indirectly.

- The community attending the health services has access to educational activities, both personally during, before, or after consultation, and in groups through talks, meetings, and similar activities.

- Implementation of the IMCI strategy should ensure the systematic implementation of the steps prescribed for the assessment, classification, and treatment of children under 5 who visit the health services.

Implementation of the IMCI strategy should guarantee the systematic implementation of the IMCI steps established for the assessment, classification, and treatment of children under 5 who visit the health services, utilizing the criteria for management of diarrhea cases proposed by PAHO/WHO, with such modifications as may have been made to adapt them to the particular country.

The target population of the study is children under 5 with a diagnosis of diarrhea who visit the health services in which is the study is being conducted.

In order to calculate the sample size and the length of the observation period it is necessary to consider the situation of the problem prior to (or at the beginning of) implementation of the strategy, and the expected impact. The steps for calculating the sample size for the study are described in the Part II, the Statistical Methodology Support Module, with regard to Studies to Compare the Situation Before and After Implementation of the IMCI strategy.

One or more health services will be selected, and a determination will be made of the proportion of cases attended with a diagnosis of diarrhea diagnosis (differentiating the diagnoses of diarrhea with or without dehydration, with or without dysentery, or persistent diarrhea), who were indicated antidiarrheal medication for treatment, before and after the effective implementation of the standard case management strategy.

The source for acquisition of the data will be the clinic daily log or patient medical record, and should include the following data:

- Age of the child
- Diagnosis
- Treatment

The age of the child is usually recorded in the consultation registries. Care should be taken to record the age of the child in months and years, in order to be able to study the group of nursing infants from 1 week to 2 months of age.

Usually the physician records the diagnosis in the consultation record. If different nomenclature is used for a single pathology, a few referral diagnoses should be selected in order to code the information. The diagnoses of the International Classification of Diseases can be used for this, or a group can be defined for the purpose.

The treatment is not always included in the Daily log or record. In these cases, it will be necessary to rely on other information sources, or to amend the registry so it includes additional exams and treatment.

The types of drugs to be included within the category of *Drugs for Diarrhea in Children* should be defined, and it should be decided whether they will be analyzed together or separately. Three types of drugs have been considered: antispasmodics, antiemetics and antidiarrheals.

If brand names of the drugs are used, a list of the common generic names should be prepared in order to be able to identify and consolidate the drugs that will be utilized. The information on the

record or log should be tabulated in order to obtain data on the number of indications of these drugs for cases of diarrhea, by diagnosis. This information, in turn, should be obtained for the different age groups that are selected.

This processing should be conducted in two different months (or over a shorter period if the number of consultations for diarrhea is quite high), before and after applying the standard case management strategy.

Annex 19.A presents a model Table for Collection and Consolidation of the Information on every disease, followed by the instructions to fill it out.

The information from the Table (Table 19.1) can be used to calculate the indicators for the prescription of drugs (antispasmodics, antiemetics, antidiarrheals) for the treatment of each type of diagnosis formulated. Other indicators can be calculated based on these examples.

In order to calculate these indicators, cases in which the prescribed treatment was not specified should be ruled out. To do this, subtract the numbers in the seventh column (**Without Specifying Treatment**) from the numbers in the second column (**Total cases Attended**). The result of the subtraction will be used as the denominator.

If the proportion of cases in which the treatment is not specified is very high (more than 40%), the results of the study may be of little value.

Table 19. 1

INDICATOR	NUMERATOR	DENOMINATOR
Proportion of cases of diarrhea treated with antispasmodics, antiemetics or antidiarrheal medication out of all cases of diarrhea	Total number of cases of diarrhea treated with antispasmodics, antiemetics, or antidiarrheal medication	Total number of cases of diarrhea cared for
Proportion of cases of diarrhea with dehydration treated with antispasmodics, antiemetics or antidiarrheals out of all cases of diarrhea with dehydration	Number of cases of diarrhea with dehydration treated with antispasmodics, antiemetics, or antidiarrheal medication	Total number of cases of diarrhea with dehydration cared for
Proportion of cases with diarrhea without dehydration treated with antidiarrheal medication out of all cases of diarrhea without dehydration	Number of cases of diarrhea without dehydration treated with antidiarrheal medication	Total number of cases of diarrhea without dehydration being seen
Proportion of cases of persistent diarrhea treated with antiemetics out of all the cases of persistent diarrhea being seen.	Number of cases of persistent diarrhea treated with antiemetics.	Total number of cases of persistent diarrhea being see

Finally a hypothesis test should be conducted for the indicators that were selected, in order to discover whether implementation of the strategy produced changes in the case management of diarrhea by the health workers. In order to calculate this test please refer to the Part II, the Statistical Methodology Support Module.

ANNEX 19.A
USE OF DRUGS FOR THE TREATMENT OF DIARRHEA IN CHILDREN UNDER 5
TABLE FOR COLLECTION AND CONSOLIDATION OF THE INFORMATION

Health Services: _____ Period/Year: _____

Age Group: _____

DIAGNOSIS	TOTAL CASES ATTENDED	WITH INDICATION OF ANTISPASMODICS	WITH INDICATION OF ANTIEMETIC	WITH ANTIDIARRHEAL PRESCRIPTION	OTHER TREATMENTS	WITHOUT SPECIFYING TREATMENT
TOTAL CASES OF DIARRHEA						
DIARRHEA WITH DEHYDRATION						
DIARRHEA WITH-OUT DEHYDRATION						
PERSISTENT DIARRHEA						
DYSENTERY						
OTHER DIARRHEAL DISEASES						

Observations:

To Fill out the Table for Collection and Consolidation of the Information:

1. Fill out the top part of the Table, writing in the name of the health services, the period (week, month, months; and the year) pertaining to the information that will be tabulated and the age group (child under 1 year and from 1 to 4 years, or other groups if so desired). A Table should be used for each age group that one wishes to consider.

2. Select the appropriate Daily log or medical record for the first day of the period that will be studied.

3. Review the Daily log or medical record selected until finding the first case of diarrhea in a child under age 5. Based on the age, select the table pertaining to the group.

4. Identify the diagnosis registered by the physician and to select the appropriate row of the Table. Then, mark (|) the second column (**Total cases Attended**) of the row selected.

5. Identify the treatment and behavior as follows:

    5.1. If an antispasmodic was indicated, mark (|) the third column (**With Indication of Antispasmodic**) of the row pertaining to the diagnosis of the case.

    5.2. If an antiemetic was indicated, mark (|) the fourth column (**With Indication of Antiemetic**) of the row pertaining to the diagnosis of the case.

    5.3. If an antidiarrheal drug was prescribed, mark (|) the fifth column (**With Indication of Antidiarrheal**) of the row pertaining to the diagnosis of the case.

    5.4. If none of the previous drugs were indicated, regardless of any other treatment that was indicated, mark (|) the sixth column (**Other Treatments**).

    5.5. If the prescribed treatment was not specified, mark (|) the seventh column (**Without Specifying Treatment**).

6. Having reviewed the appropriate daily consultation registries for all the selected period, the number of marks (|) in each box of the Table should be added, and the number resulting in each recorded.

7. Total the numbers contained in all the boxes of each column to obtain the figures for the second row (**Total Cases of Diarrhea**).

PROTOCOL 20

IMPACT OF THE IMCI STRATEGY ON THE USE OF ANTIBIOTICS FOR TREATMENT OF ARI AND DIARRHEA

INTRODUCTION

The majority of ARI cases visiting the health services, typically between 50% and 80%, are treated with antibiotics. Many cases of diarrhea are also treated unnecessarily with antibiotics, or with antidiarrheal compounds and other drugs that contain antibiotics.

Some cases of ARI and diarrhea require antibiotics for treatment, such as pneumonia, acute otitis media, and streptococcal pharyngitis (in ARI), and dysentery (in diarrhea). The majority of cases of ARI and diarrhea that visit the health services do not benefit from the administration of antibiotics, since these meds do nothing to alter the clinical picture, shorten the duration of the symptoms, or prevent complications. In children with coughs or colds, bronchitis, flu, or non-streptococcal pharyngitis, who represents 70% or more of the children with ARI and children presenting with diarrheal diseases that are not dysenteric (95%) of the cases there are no need for antibiotic treatment.

Implementation of the IMCI strategy's component of management of ARI cases and diarrhea substantially reduces the use of antibiotics, since these drugs are indicated only for cases of pneumonia, acute otitis media, streptococcal pharyngitis, and dysentery (diarrhea with blood in the stool).

The decline in the use of antibiotics can be evaluated by analyzing the proportion of ARI and diarrhea cases served that received this treatment before and after implementation of the IMCI strategy. However, it is even more important to evaluate the reduction in the use of antibiotics in cases of ARI that do not require them.

OBJECTIVE

Determine the impact of the effective implementation of the IMCI strategy on the use of antibiotics for the management of ARI and diarrhea cases.

METHODOLOGY

In order to measure the proposed objective, the proportion of cases of children under 5 with a diagnosis of ARI and diarrhea that were treated with antibiotics should be observed, before and after implementation of the IMCI strategy in the selected health services.

The effective implementation of the IMCI strategy implies that:

- The health services personnel have been trained in the theoretical and practical implementation of the strategy, preferably having attended an IMCI clinical course.

- The health services where the trained staff works have the necessary supplies to implement the recommendations for the assessment and treatment of the children.

- The health workers are able to analyze problems, difficulties, and questions concerning the correct implementation of the IMCI strategy, through follow-up visits after training, and periodic supervision, both directly and indirectly.

- Patients attending the health services has access to educational activities, both personally during, before, or after consultation, and in groups through talks, meetings, and similar activities.

Implementation of the IMCI strategy should ensure the systematic implementation of the steps prescribed for the assessment, classification, and treatment of children under 5 who visit the health services.

The target population of the study are children under 5 with a diagnosis of ARI or diarrhea who visit the health services in which the study is being conducted.

In order to calculate the size of the sample to be studied and the length of the observation period it is necessary to consider the situation of the problem prior to (or at the beginning of) implementation of the strategy, and the expected impact. The steps for calculating the sample size for the study are described in the Part II, the Statistical Methodology Support Module, with regard to Studies to Compare the Situation Before and After Implementation of the IMCI strategy.

One or more health services will be selected and there will be a determination of the proportion of cases attended with a diagnosis of ARI (differentiating for diagnoses of pneumonia, acute otitis media, streptococcal pharyngitis, and other ARI) or of diarrhea (differentiating for diagnoses of diarrhea with and without dysentery) for which antibiotics were prescribed for treatment, before and after effective implementation of the IMCI strategy.

The source for acquisition of the data will be the Daily log or medical record, and should include the following data:

- Age of the child
- Diagnosis
- Treatment

The age of the child is usually recorded in the consultation log. Care should be taken to record the age of the child in months and years, in order to be able to study the group of nursing infants from 2 weeks to 2 months of age.

Usually the physician records the diagnosis in the medical record. If different nomenclature is used for a single pathology, a few referral diagnoses should be selected in order to code the information. The diagnoses of the International Classification of Diseases can be used for this, or a group can be defined for the purpose.

Additional exams and treatment are not always included in the Daily log. In these cases, it will be necessary to rely on other information sources, or to amend the registry so it includes complementary examinations and treatment.

The information on the registries should be tabulated to obtain data on the number of antibiotic prescriptions for ARI cases and diarrhea according to the diagnosis. This information, in turn, should be obtained for the different age groups that are selected.

This processing should be conducted in two different months or within a shorter period if the number of consultations for ARI and diarrhea is quite high, before and after applying the IMCI strategy.

The Annex 20.A presents a model Worksheet for Collection of Information based on the registries of the outpatient services.

Annex 20.B presents a model Table for Consolidation of the Information, followed by instructions on how to register the data.

The information from the Table can be used to calculate the indicators (Table 20.1) for prescription of antibiotics for the treatment of each type of diagnosis formulated. Other indicators can be calculated based on these examples.

In order to calculate these indicators, cases where the prescribed treatment was not specified should be ruled out. To do this, subtract the numbers the fifth column (**Without Specifying Treatment**) from the numbers in the second column (**Total cases Attended**).The results of the subtraction will be used as the denominator.

Finally a hypothesis test should be conducted for the indicators that were selected, in order to discover whether implementation of the strategy produced changes in the management of cases of ARI and diarrhea by the health workers. In order to calculate this test please refer to the Part II, the Statistical Methodology Support Module.

If the proportion of cases in which the treatment is not specified is very high (more than 40%), the results of the study may be of little value.

Table 20.1

INDICATOR	NUMERATOR	DENOMINATOR
Proportion of ARI cases treated with antibiotics out of all cases ARI cases	Total number of ARI cases treated with antibiotics	Total number of ARI cases attended
Proportion of cases of No Pneumonia: Cough or Cold treated with antibiotics out of all cases of No Pneumonia: Cough or Cold treated	Number of cases of No Pneumonia: Cough or Cold treated with antibiotics	Total number of cases of No Pneumonia: Cough or Cold cared for
Proportion of cases of diarrhea treated with antibiotics out of all cases of diarrhea	Total number of cases of diarrhea treated with antibiotics	Total number of cases of diarrhea cared for
Proportion of cases of diarrhea without dysentery treated with antibiotics out of all cases of diarrhea without dysentery	Number of cases of diarrhea without dysentery treated with antibiotics	Total number of cases of diarrhea without dysentery treated

ANNEX 20.A
USE OF ANTIBIOTICS FOR TREATMENT OF ACUTE RESPIRATORY INFECTIONS AND DIARRHEAL DISEASES

DATA COLLECTION WORKSHEET

Health Services _____ Period/Year: _____

No.	SURNAME AND NAME	AGE	DIAGNOSIS	WITH ANTI-BIOTIC	WITHOUT ANTI-BIOTIC	WITHOUT SPECIFYING TREATMENT

Observations:

ANNEX 20.B
USE OF ANTIBIOTICS FOR THE TREATMENT OF ACUTE RESPIRATORY INFECTIONS AND DIARRHEAL DISEASES

TABLE FOR CONSOLIDATION OF THE INFORMATION

Health Services: _____ Period/Year: _____

Age Group: _____

DIAGNOSIS	TOTAL CASES ATTENDED	WITH INDICATION OF ANTIBIOTIC	WITHOUT INDICATION OF ANTIBIOTIC	WITHOUT SPECIFYING TREATMENT
TOTAL OF ARI CASES				
PNEUMONIA				
NO PNEUMONIA: COUGH OR COLD				
FLU				
STREPTOCOCCAL PHARYNGITIS				
ACUTE OTITIS MEDIA				
OTHER ARI				
TOTAL CASES OF DIARRHEA				
DIARRHEA WITHOUT SIGNS OF DYSENTERY				
DIARRHEA WITH SIGNS OF DYSENTERY				

Observations:

To Fill out the Data Collection Worksheet:

1. Fill out the top part of the Worksheet, writing in the name of the health services and the period (week, month, months; and the year) pertaining to the information to be registered.

2. Select the appropriate Daily log for the first day of the period that will be studied.

3. Review the Registry until finding the first case of ARI or diarrhea in a child under 5 in the selected period.

4. Record the data from the Worksheet: surname and name, age, diagnosis, and with regard to the treatment indication: if antibiotics were prescribed, were not prescribed, or it is not specified.

To Fill out the Table for Consolidation of the Information:

1. Fill out the top part of the Table, writing in the name of the health services, the period (week, month, months; and the year) pertaining to the information that will be tabulated and the age group (child under 1 year and from 1 to 4 years, or other groups if so desired). A Table should be used for each age group that one wishes to consider.

2. Based on the Worksheet for Collection of the Information continue with the following steps. Based on the age, select the appropriate Table.

3. Identify the diagnosis registered by the physician and select the appropriate row of the Table. Then, mark (|) the second column (**Total cases Attended**) of the row selected.

    3.1. If antibiotics were prescribed, mark (|) the third column (**With Indication of Antibiotics**) of the appropriate row for the case diagnosis.

    3.2. If antibiotics were not prescribed, regardless of any other treatment that was indicated, mark (|) the fourth column (**Without Indication of Antibiotics**).

    3.3. If the treatment prescribed was not specified, mark (|) the fifth column (**Without Specifying Treatment**).

4. Having reviewed the appropriate daily consultation registries for all the selected period, total the number of marks (|) in each box of the Table and write the resulting number in each one.

3. Total the numbers contained in all the boxes of each column to obtain the figures for the second row (**Total ARI cases)** and the ninth row **(Total Cases of Diarrhea**).

PROTOCOL 21

IMPACT OF THE IMCI STRATEGY ON HOSPITAL REFERRALS OF CHILDREN UNDER 5 YEARS SEEN AT THE PRIMARY CARE LEVEL

INTRODUCTION

Generally speaking, only a small fraction of the children brought by their parents to the health care services of the primary level due to disease needs to be seen at a hospital; They are referred either to have additional studies for diagnosis or for treatment. In many health services, however, a high proportion of the patients seen are referred to hospitals for tests or medical treatment for no appropriate reason.
There are many reasons for this. In some cases, the health workers are unsure of the classification and treatment of the case and refer it to a hospital. In other cases, the parents show a special concern for having their child assessed, and ultimately desire treatment, in a hospital.

In many cases, referring children to the hospital who could otherwise have been adequately treated at the primary level of care raises many complications:

- It is not always possible to bring the mother to the hospital with the child, either for financial reasons or because she cannot leave the other children in the family alone, or she cannot take off work for long.

- Frequent referrals of the child to the hospital can discourage the mother from going to the health center, and instead go directly to the hospital.

- If the hospital feels the mother was referred unnecessarily, the health center loses credibility and this can discourage the mother from taking her child to the hospital when it is really necessary.

- The mother has greater problems in taking care of her child at the hospital than at the peripheral health services; sometimes this means long waits or even new visits for tests or to get results.

- Hospital care services are often overburdened due to excessive referrals from the peripheral level. Thus, most of the staff's time is occupied in evaluating and treating cases that can be resolved at the peripheral health services.

- Unnecessary hospitalization of the child exposes it to risk of contagion from other infections, apart from the risks of the procedures and hospital environment.

In recent years special emphasis has been placed on enhancing the problem-solving ability of the primary level of care through the IMCI strategy; this includes training health workers in the use of standardized criteria for assessment, classification, and treatment. These criteria, which are summarized in the case management standards for the most common health care problems, have

helped in reducing the proportion of cases referred to hospitals, while improving the quality of the care provided at the primary level health services.

The criteria for assessment included in the IMCI strategy make it possible to identify children who really do require hospital treatment, so they can be properly referred and clearly differentiated from cases that can be handled on an outpatient basis at the health care services of the primary level, either with specific drugs or with symptomatic measures. The IMCI strategy includes a set of the signs and symptoms of the highest predictive value that not only make possible the rapid identification of critically ill children, but also the early identification of health problems that require immediate treatment to prevent worsening.

OBJECTIVE OF THE STUDY

Determine the impact of the effective implementation of the IMCI strategy on cases referred to a hospital from the outpatient services (health centers, general outpatient clinic and emergency services).

METHODOLOGY

In order to measure the proposed objective there will be a determination of the proportion of cases attended that were referred to a hospital, before and after effective implementation of the IMCI strategy.

- The health services personnel have been trained in the theoretical and practical implementation of the strategy, preferably having attended an IMCI clinical course.

- The health services where the trained staff works have the necessary supplies to implement the recommendations for the assessment and treatment of the children.

- The health workers are able to analyze problems, difficulties, and questions concerning the correct implementation of the IMCI strategy, through post-training follow-up visits and periodic supervision, both directly and indirectly.

- The community attending the health services have access to educational activities, both personally before, during, or after consultation, and in groups through talks, meetings, and similar activities.

Implementation of the IMCI strategy should ensure the systematic implementation of the steps prescribed for the assessment, classification, and treatment of children under 5 who visit the health services.

Implementation of the IMCI strategy should guarantee the systematic implementation of the IMCI steps established for the assessment, classification, and treatment of children under 5 who visit the health services.

The target population of the study are children under 5 years diagnosed with pathologies covered by the IMCI strategy who visit the health services in which the study is being conducted.

In order to calculate the size of the sample to be studied and the length of the observation period it is necessary to consider the situation of the problem prior to (or at the beginning of) implementation of the strategy, and the expected impact. The steps for calculating the sample size for the study are described in the Part II, the Statistical Methodology Support Module, with regard to Studies to Compare the Situation Before and After Implementation of the IMCI strategy.

One or more health services will be selected, to assemble enough number of consultations of children under 5 due to ARI, diarrhea, malaria, malnutrition, and other diseases included in the IMCI strategy.

The cases attended can be differentiated according to the medical diagnosis (or classification by non medical health workers), such as pneumonia, bronchitis, bronchiolitis, flu, pharyngitis, cold, diarrhea with or without dehydration, dysentery, persistent diarrhea, severe malnutrition, malaria, etc.

The source for acquisition of the data will be the clinic daily log or medical record , and should include the following data:

- Age of the child
- Diagnosis or classification
- Was or was not referred to a hospital

The age of the child is usually recorded in the consultation log. Care should be taken to record the age of the child in months and years, in order to be able to study the group of nursing infants 1 week to 2 months of age.

Usually the physician records the diagnosis in the medical log or record. If different nomenclature is used for a single pathology, a few referral diagnoses should be selected in order to code the information. The diagnoses of the International Classification of Diseases can be used for this, or a group can be defined for the purpose.

Additional exams and treatment are not always included in the Daily log. In these cases, it will be necessary to rely on other information sources, or to amend the registry so the space to record the treatment includes whether the patient was referred to the hospital. The record-keeping personnel should also be informed whether the referral was for additional studies (usually laboratory and radiology) or for hospitalization.

Medical staff of the selected services should be advised to:

- Always register the treatment prescribed to the child, even if it only consisted of counseling the mother with regard to the care of the child at home.

- Always indicate in the record if the referral to a hospital is for additional studies or for hospitalization.

- Consider the case as *No Information* when nothing is recorded in the space for indicating the treatment.

The information on the record should be tabulated in order to obtain data on the number of cases of each disease cared for and on the total number of the diseases included in the IMCI strategy. The tabulation should include how many of these were referred to a hospital, differentiating those sent for complementary studies from those referred for admission. This information should also be obtained for the different age groups that are selected.

Processing should be conducted in two different months or within a shorter period if there is a large number of consultations, or a longer period if the number of consultations is low. Regardless of the period considered, care should be taken to ensure that the activities necessary for effective implementation of the IMCI strategy have been conducted.

Annex 21.A presents a model Table for Collection and Consolidation of the Information on each disease or group of diseases, followed by the instructions to fill it out.

The information from the Table can be used to calculate the indicators (Table 21.1) for total case referral and hospitalization for the total cases attended and for each type of diagnosis.

In order to calculate the indicators that occur below, cases where the prescribed treatment was not specified should be ruled out. To do this, subtract the numbers in the seventh column (**Treatment Not Specified**) from the numbers in the second column (**Total cases Attended**). The result of the subtraction will be used as the denominator.

The indicators stated in the table should be regarded as examples. Other indicators can be calculated as a function of the diagnosis, the age of the child, the reason for the hospital referral.

Finally a hypothesis test should be conducted for the indicators that were selected, in order to discover whether implementation of the strategy produced changes in the components being studied. In order to calculate this test please refer to the Part II, the Statistical Methodology Support Module.

If the proportion of cases in which the treatment is not specified is very high (more than 40%), the results of the study may be of little value.

Table 21.1

INDICATOR	NUMERATOR	DENOMINATOR
Proportion of cases referred out of all cases	Total number of referred cases	Total number of cases attended
Proportion of referred cases of pneumonia out of all cases	Number of referred cases of pneumonia	Total number of cases attended of pneumonia
Proportion of pneumonia referred for x-ray out of all cases of pneumonia served	Number of referred cases of pneumonia for x-ray	Total number of cases of pneumonia cared for
Proportion of cases of diarrhea referred for laboratory test out of all cases of diarrhea	Number of cases of diarrhea referred for laboratory test	Total number of cases of diarrhea cared for
Proportion of cases of malaria referred for hospitalization out of all cases of malaria	Number of cases of malaria referred for hospitalization	Total number of cases of malaria cared for
Proportion of cases of fever referred for hospitalization or study out of all cases of fever	Number of cases of fever referred for hospitalization or for study	Total number of cases of fever cared for

ANNEX 21.A
CASES OF CHILDHOOD ILLNESS REFERRED TO THE HOSPITAL

TABLE FOR COLLECTION AND CONSOLIDATION OF THE INFORMATION

Health Services: _____ Period/Year: _____

Age Group: _____

DIAGNOSIS	TOTAL CASES ATTENDED	REFERRED CASES				TREATMENT NOT SPECIFIED
		FOR HOSPITALIZATION	PARA ESTUDIO			
			Rx	LAB.	OTHERS	
TOTAL OF CASES						
PNEUMONIA						
BRONCHITIS						
BRONCHIOLITIS						
FLU						
COUGH OR COLD						
DIARRHEA						
MALNUTRITION						
FEVER						
MALARIA						

Observations:

To Fill out the Table for Collection and Consolidation of the Information:

1. Fill out the top part of the Table, writing in the name of the health services, the period (week, month, months; and the year) pertaining to the information that will be tabulated and the age group (children of 1 week to 2 months, 2 to 11 months, 1 to 4 years, or other groups if so desired). A Table should be used for each age group that one wishes to consider.

2. Select the appropriate Daily log or medical record for the first day of the period that will be studied.

3. Review the Daily Registry selected until finding the first case of ARI, diarrhea, malaria, malnutrition, or other disease prevalent in children under 5. Based on the age, select the Table pertaining to its age group.

4. Select the row of the Table pertaining to the diagnosis of the registry. Then, mark (|) the second column (**Total cases Attended**) of the row selected.

5. Identify the treatment and behavior as follows:

   5.1. If the case was referred to a hospital for hospitalization, mark (|) the third column (**Cases Referred for Hospitalization**) of the row pertaining to the diagnosis of the case.

   5.2. If the case was not referred for hospitalization but for another reason, mark (|) the fourth, fifth, or sixth column depending on whether the case was referred for radiology, laboratory test, or other, respectively.

   5.3. If it is was not specified whether or not a referral took place, mark (|) the seventh column (**Treatment Not Specified**). In this column note *only* the cases where no treatment of any type is specified. In cases that register some type of treatment but do not mention referral to the hospital, it should be considered that the case was not referred (this should be clearly established while planning work with the health services).

6. Having reviewed the appropriate daily consultation registries for the entire period selected, total the number of marks (|) in each box of the Table and write the resulting number in each.

7. Total the numbers contained in all the boxes of each column to obtain the figures for the second row (**Total of cases**).

PROTOCOL 22

IMPACT OF THE IMCI STRATEGY ON IMPROVING APPROPRIATE REFERRALS BETWEEN PRIMARY LEVEL SERVICES AND HOSPITALS

INTRODUCTION

Strengthening the primary level health services is the most important step to improve the access to care and obtaining adequate medical services as close as possible to home. From the standpoint of the organization of the health system, the possibility of resolving a high proportion of diseases and other health problems in the primary level health care services is important since it reduces the use of the hospitals of higher complexity and helps cut the costs of care.

From the standpoint of the population, empowering them to solve most of their health problems at the primary level of care helps prioritize problems while reducing the costs of going to a hospital for diagnosis or treatment. Referral to a hospital, however, is a requirement of the primary level health services since many of the cases cannot be resolved without additional studies, or require specialized treatments that are available only at the referral levels.

Once it has been demonstrated that referral to a hospital is needed, the effort involved—for the primary level health services, for the hospital, and for the community—will be justified by the medical necessity . However, when the hospital referral turns out to be unnecessary, it reduces the credibility of the health services and the population's confidence in them, while unnecessarily increasing the costs of care.

The population's doubts about the need to go to the hospital, based on their experience, will often lead them to disregard the indications of the health workers and treat their child at home. In other cases, the population will choose to delay visiting the primary level health services, since they suspect they will be unable to resolve the situation, and that in any case it will be necessary to go to the hospital. Finally, the population may choose to go directly to the hospital, rather than the primary level health care services, in view of the fact that the latter lacks the capacity to solve most of the problems for which care is sought.

Unnecessary case referrals distort the hospital's function, since it should devote most of its efforts to the treatment and resolution of cases that could have been cared for successfully at the primary level health services.

Improving the referral of cases from the primary level of care to the hospital can thus help improve the population's view of the former, while ensuring that the hospital will make the necessary effort; when a referral is indicated, this will optimize the use of hospital installations and it will contribute to improving the relationship between the hospital and the peripheral services.

The IMCI strategy systematizes the criteria for assessment, classification, and treatment, and thus helps improve the criteria for referral from the primary level of care, ensuring that, in most cases,

the health problems and diseases which lead the population to seek care for their children will be resolved at the local level.

Standardizing the procedures for referrals of cases that require hospital treatment helps improve the care and treatment of the child during his or her transfer to the hospital, and to better flows information between the peripheral level and the hospital, thus helping improve the relationship between both services.

OBJECTIVES

The general objective of this study is to evaluate improvements in the referral of sick children from the primary level health care services to the hospital.

The study proposes to evaluate changes that occur due to implementation of the IMCI strategy in the primary level health care services, with regard to the following variables:

- Consistency between standardized criteria for referrals between the primary level health care services and the hospitals.
- Parental fulfillment of the referral.
- Treatment indications for the children prior to referral and during the transfer to the hospital.
- Understanding of the child's parents or caregivers on the need for referral to the hospital and on the child's care during the transfer.

METHODOLOGY

Population

The population to be studied will be children under 5 referred the hospital from the health care services of the primary level who are selected to conduct the study. These services should be selected with regard to implementation of the IMCI strategy (below, see criteria the health services should consider in applying the IMCI strategy) and the number of consultations of children under 5 who need to be referred to a hospital, so there are enough of them for the study.

Sample Size

In determining the sample size, the number of children studied before and after implementation of the IMCI strategy should be similar. It is advisable to assemble between 50 and 60 referral cases for each subgroup to be studied. For example, if the improvement of the quality of referrals by a given primary level service is being analyzed, a similar number of referral cases, both before and after applying the IMCI strategy, should be assembled. However, if there is a decision to study this as a function of the case classification (for example, cases classified as severe pneumonia or as very severe illness), there should be a similar number of cases referred with these diseases both before and after applying the IMCI strategy. Likewise for any subgroup being analyzed. The steps to calculate the study sample size are described in the Module of Support in Statistical Methodology of Part II on research on studies to Compare the Situation Before and After Implementation of the IMCI strategy.

Study Variables

The following variables will be studied, in all these children:

- Treatment decisions made by health workers at the primary level of care and by the health workers who received the child in the hospital.

- Treatment administered before the transfer and treatment indications provided to the child's family and to be observed during the transfer.

- Parental fulfillment of the referral.

- The mother's understanding of the reasons for the referral and the child's care during the transfer.

The above variables will be assessed before and after implementation of the IMCI strategy, in order to observe whether there were changes. The changes will be assessed as a function of:

- The degree of parental fulfillment of the referral.
- Consistency between decisions for additional exams and treatment recommended by personnel of the primary level and by the hospital staff.
- The parents' understanding of the need for the referral and the child's care during the transfer to the hospital.

Important procedures to be followed by the Health Services Involved in the Effort

Since this effort includes the study of the above variables before and after implementation of the IMCI strategy, the primary level health services that participate should apply the IMCI strategy once the first assessment of these variables has been finalized.

Likewise, between assessments there should be no changes that might affect the feasibility of referrals from the primary level to the hospital, such as arrival of new transportation or communications equipment, certification of a new hospital, etc.

The IMCI strategy should also be applied at the referral hospital in order to conduct a systematic assessment of the signs and symptoms included in the IMCI clinical assessment process. This is essential in order to compare the findings of the assessment of the primary level health services with those of the hospital.

Although it would be advisable for the hospital also to apply the criteria for classification and treatment contained in the IMCI strategy, both the classification and the treatment decisions can be determined on the basis of the signs and symptoms identified in the assessment conducted by the hospital staff.

In order to consider that a health service is applying the IMCI strategy, the following conditions should be met:

- The health workers of the service responsible for outpatient health care of children who consult there will have been trained in an IMCI clinical course on the theory and practice of case care.

- The health services at which the trained staff are working has the necessary elements and supplies to apply the criteria for diagnosis and case management established in the IMCI strategy.

- Personnel received at least one follow-up visit after training in order to get supplementary support to evaluate their performance in the effective implementation of the strategy, identify problems that might have arisen, and recommend solutions.

- The staff periodically receives direct or indirect supervision to confirm the effective implementation of the IMCI strategy.

Suggested Instruments for Collection of Information

Information for the study will be registered using the following instruments:

- Registries of outpatient consultation, itemizing signs and symptoms identified by the health workers, in both the primary level health care services and in the referral hospital.

- Record of interview with the parents to assess their knowledge of the reasons for the referral and the recommendations for care and treatment of the child during the transfer.

- File or registry of case referrals from the service of the primary level to the hospital.

Outpatient Consultation Registries

This should make use of existing registries of the health services, so as not to introduce new forms, which can complicate the job of the health workers. However, this recommendation is applicable only if the current consultation registries record the signs and symptoms found during the case assessment, classification per criteria of the IMCI strategy, and treatment

Possibly, this information will not be found in the registries ordinarily used at primary level services. If so, the incorporation of a new registry should be included; to this end, it is suggested that the registration form used during the IMCI clinical course be used, both for children from 1 week to 2 months of age and for children from 2 months to 4 years (Annex 22.D).

The hospital services usually have more detailed record of the care but these are not always used by the outpatient or emergency services of the hospital. Also, if the registries used by these hospital services do not include information of the signs and symptoms of the assessment, the form mentioned above should be included.

The hospital should also register the treatment the child received in the health services before the referral and during the transfer.

The registration form of the IMCI clinical course should be used systematically both at the hospital and in the primary level health services, i.e. it should be used in all consultations that are cared for, since it cannot be known in advance which children will be referred to the hospital or which children were referred from the primary level of care (especially when the child's parents don't have a referral slip).

Tanto en el hospital como en el servicio de salud del primer nivel, el uso del formulario de registro utilizado durante el curso clínico AIEPI deberá ser sistemático, esto es, deberá utilizarse en todas las consultas que se atienden, ya que no se sabrá con anticipación qué niño será referido al hospital o cuál de los niños fue referido desde el primer nivel de atención (sobre todo cuando los padres del niño no tengan una nota de referencia).

Record of Interview with the Parents

In order to evaluate the degree to which the parents understand the reasons for the referral, as well as the care of the child during the transfer, an interview form will be used in two different ways:

- Parents who take their child to the hospital will be interviewed at the hospital itself, once the child has been cared for and treated, either by being hospitalized or because the staff has prescribed outpatient treatment.

- Parents who have not taken the child to the hospital will be interviewed subsequently in the home to investigate why the child was not taken the hospital (see Protocol 30: *Causes and Factors Related to the Parents Failure to Fulfill the Hospital Referral*).

It should be noted that the use of the interview form in Annex 22.C, does not affect the implementation of any procedure for diagnosis or treatment of the child. It is suggested that the interview form not be presented to the parents at the conclusion of the outpatient consultation in the primary level health services. Once the staff has decided to refer the child to a hospital, there should be no delay in following through with this referral; in any case, the parents will be in an emotional state that will affect the results of the interview. The parents' interview can be conducted at the hospital once the child has been assessed and diagnosed by the health workers and appropriate treatment measures have been applied.

Assessment to be Performed

The assessment should analyze the variables that make it possible to determine whether the quality of case referrals from the primary level services has improved or not based on implementation of the IMCI strategy. To conduct this analysis, the medical records for children referred to the hospital from each primary level health service should be identified; likewise with those for children received at the hospital. It is suggested that once this has been done both record be consolidated in order to facilitate the analysis.

The analysis can be conducted by primary level health services, or, if more than one health workers works at one or more of these services, by health workers. This should be done before and after implementing the IMCI strategy in order to determine if there was or was not improvement in the variables to be measured.

In order to consolidate the information a variety of tables can be used, as itemized below.

Analysis of Parental Compliance with the Referral

This analysis requires counting the total number of children for whom the health workers of the primary level indicated a referral to the hospital, and the number who actually reached the hospital as part of the referral process. It is suggested that Annex 22.A be used to consolidate this information.

For children who were actually brought to the hospital by their parents, it should be confirmed whether they did so with a referral slip, and evaluating whether the health workers noted:

Data identifying the child
Signs and symptoms identified in the assessment
The appropriate classification for the signs and symptoms identified
The treatment administered

On obtaining the appropriate hospital records of children, it should be confirmed that the care provided was due to the referral indicated by the health workers from the primary level, since children may have been brought in by their parents several days after the indication of that referral. To this end the hospital treatment date can be taken into account; it should correspond to the same date of the care and referral provided by the primary level health services, and the existence of the referral form.

Attention should be paid to the possibility that a hospital record will not be found, even though the child was actually brought in by the parents. This is especially likely to occur if the child was not hospitalized. The problem can be solved if the study simultaneously analyzes possible reasons for the parents failing to go to the hospital (see Protocol 30); the interview can be used to confirm whether the child was actually taken to the hospital.

Analysis of Consistency between Treatment Decisions Made by Health Workers at the Primary Level and at the Hospital

In order to analyze this aspect there should be a review of the records of all children cared for and referred from the health care services of the primary level and who were received in the hospital. The care forms of the service provided by the primary level and in the hospital should be available for all the children. It is suggested that Table of Annex 22.B be used to consolidate the results.

Analysis of the Parents' Understanding of the Reasons for Treatment and for Complying with Recommendations on the Child's Care During the Transfer

In order to evaluate this aspect it is suggested that an Interview Record of the type included as Annex 22.C be used. The file should be reviewed and adapted to the needs of the study and the variables it should include. This file can be used to interview the parents once the child is already in the hospital, and a course of treatment has been decided upon and implemented.

The information consolidated with this file can be used to process the indicators, and to sort the cases into different groups, as a function of the variables in the file. For example, the degree of understanding of the parents on the reasons for the referral of the child to the Hospital can be assessed as a function of the educational level of the mother or of both parents, and so forth.

A variety of computer programs can be used to consolidate and process the results, or to prepare Tables for Consolidation of the Information similar to the Table in Annex 22.A, including each indicator to be studied in the first column to be studied.

To Calculate the Indicators

The consolidated information can be used to calculate various indicators on the quality of the referral from the primary level of care, both in terms of consistency between the treatment decisions taken by the health workers of the primary level and those taken by the Hospital staff, and the parents' understanding of the child's care at home.

The indicators that can be calculated will vary as a function of the variables that were included in the study, especially in the parental Interview Record.

Each indicator can be assessed for the total of the aforementioned children, or broken down by different groups (age, classification, etc.).

Table 22.1 includes some examples of indicators that can be calculated, and the formulas for calculating them. The indicators are included only by way of example; other types of relationships can also be calculated.

Having calculated the indicators for before and after implementation of the IMCI strategy, there should be an assessment of whether they reflect any changes; to do this, the appropriate statistical tests found in the Module of Support in Methodology of Statistics of Part II should be applied.

Table 22.1

INDICATOR	NUMERATOR	DENOMINATOR
Proportion of children referred from primary level services who were actually taken to the hospital by their parents	Number of children referred from the primary level services who were taken by their parents to the hospital	Total number of children referred from the primary level
Proportion of children referred for hospitalization from the primary level who were actually hospitalized	Number of children referred for hospitalization from the primary level	Number of children referred for hospitalization from the primary level who were actually admitted at the Hospital
Proportion of referred children who arrived in the hospital with a referral note	Number of children referred from the primary level who arrived at the hospital with a referral slip	Total number of children referred from the primary level who arrived at the hospital
Proportion of children referred from the primary level whose parents understood the reasons why the child should be hospitalized	Number of children referred from the primary level whose parents understood the reasons why the child should be hospitalized	Number of children referred from the primary level
Proportion of children referred from the primary level who were treated correctly during the transfer	Number of children referred from the primary level who were treated correctly during the transfer	Number of children referred from the primary level

ANNEX 22.A
COMPLIANCE WITH THE REFERRAL INDICATED BY THE HEALTH WORKERS

TABLE FOR CONSOLIDATION OF THE INFORMATION

Health Services/Personnel: _____ Period:_____

ASPECT	NUMBER	PERCENTAGE
TOTAL OF REFERRED CASES		
• WITH HOSPITAL REGISTRY		
- With Referral Slip		
- With identification data		
- With signs and symptoms		
- With classification		
- With treatment administered at the service		
- Without referral sheet		
• WITHOUT HOSPITAL REGISTRY		
- Were not taken to the hospital		
- Yes, were taken to the hospital		
- No information		

Observations:

ANNEX 22.B
CONSISTENCY BETWEEN TREATMENT DECISIONS AT PRIMARY CARE HEALTH SERVICES AND AT THE HOSPITAL
TABLE FOR CONSOLIDATION OF THE INFORMATION

Health Services/ Health Workers: _____ Period: _____

TREATMENT DECISION TAKEN AT THE HOSPITAL	TREATMENT DECISION TAKEN AT THE HEALTH SERVICES				
	TOTAL	HOSPITALIZED	NOT HOSPITALIZED		
			DIAGNOSTIC STUDIES	COMPLEMENTARY TREATMENTS	OUTPATIENT TREATMENT
TOTAL OF REFERRED CASES					
FOR STUDY					
FOR HOSPITALIZATION					

Observations:

To Fill out the Table for Consolidation of the Information:

1. Fill out the identification data of the Table including the health services in question, health workers who will be responsible for the analysis (if there has been a decision to break down the analysis by health workers), and time period corresponding to the registries that will be reviewed.

2. Select the first pair of registries (of the primary level health services and of the Hospital) pertaining to each child referred to and received at the Hospital.

3. Record the treatment decision taken at the primary level health services (Referral for Study, and Referral for Hospitalization) and select the appropriate row of the Table.

4. Record the treatment decision taken at the hospital for that child and select the appropriate column.

5. Mark (|) the selected intersection of the column and the row.

6. Proceed in the same way with all the registries until you are done.

7. Add all marks (|) made in each box and note the sum in the same box.

8. Add all numbers from the boxes on the same row and write the resulting number in the **Total** column. Proceed in the same way with the boxes in the same column and to note the sum in the **Total of Referred Cases** row.

ANNEX 22.C
INTERVIEW OF THE MOTHER OF A CHILD REFERRED TO THE HOSPITAL FROM PRIMARY CARE SERVICES
INTERVIEW RECORD

Name of the child:_____ Name of the mother: _____

Address: _____

Date of interview: ___/___/___/ Date of initial consultation: ___/___/___/

Identification data of the child:
Age: [_____] Sex: [____] Date of Birth: ____/____/____/
Marital status of the mother Stable union Yes [__] No [__] Cohabit: Yes [__] No [__] Single [___] Yes [__] No [__] Unstable union Yes [__] No [__]
Composition of the family (persons living in the same residence):
Father Yes [__] No [__] Grandmother Yes [__] No [__] | Siblings Yes [__] No [__] Mother Yes [__] No [__] Grandfather Yes [__] No [__] | –Older No.[_____] –Younger No.[_____]
Who cares for the child: [_____]
Education of the mother: Primary [__] Years [___] Secondary [__] Years [___] Higher [___]
Education of the father: Primary [__] Years [___] Secondary [__] Years [___] Higher [___]
Education of person caring for the child Primary [__] Years [___] Secondary [__] Years [___] Higher [___]
Housing Characteristics
Urban [___] Rural [___] Number of rooms: [___] Indoor plumbing: Yes [__] No [__]
Bathroom: Yes [__] No [__] Latrine: Yes [__] No [__] Eating environment: Yes [__] No [__]
No. of people sleeping in each room: [_____]
Number of people who sleep with the child: [_____]
On Control of Pregnancy Appropriate for Birth of the Child
Control of pregnancy Yes [__] No [__] Health Center [___] Hospital [___]
Other: _____
Has Prenatal Card Yes [__] No [__] Early Followup: Yes [__] No [__] Periodic: Yes [__] No [__]
On the Birth of the Child and Feeding at Birth
Where was the child born? Hospital [___] Residence [___] Other: _____
Has the child been with you since was it born? Yes [__] No [__]
Was it breastfed? Yes [__] No [__]
When was the first time it was breastfed?
Was something given the child before breastfeeding? Yes [__] No [__]
What was given to it?
Who indicated what was to be given? Health workers [___] Relative [__] Other:_____
For what?
In the Hospital, did they provide any indication on feeding the child? Yes [__] No [__]
What indication was provided?
Did they provide some food for the child upon leaving the Hospital? Yes [__] No [__]
What did they provide?

In addition to breast milk, did you give something else to the child when you left the Hospital? Yes [__] No [__]

If Yes, you gave it something, what was it?

Why did you give it that?

On Followup of the Child

When was the first time you took the child for a followup?

To whom did you take it? Health services [__] Healer [__] Other one:

Does the child have a vaccination Card? Yes [__] No [__]

Vaccines Current? Yes [__] No [__]

Does you have a growth followup Card? Yes [__] No [__]

Followup Current? Yes [__] No [__]

On the Dynamic of the Family and Child Care

Work Father Yes [__] No [__] Outside the home? Yes [__] No [__] Hours

Mother Yes [__] No [__] Outside the home? Yes [__] No [__] Hours

Do you have enough time to care for the child? Yes [__] No [__]

Why?

	Who is in the home?	Who takes care of the child?	Who feeds the child?
In the morning			
In mid-day			
In the afternoon			
At night			

On the Consultation of the Child

When did they take to child to consultation?

Who took the child to the health services?

Why did they take the child to the health services?

What did the health services say the child had?

Did they say why it was necessary to take the child to the Hospital? Yes [__] No [__]

What were the reasons they told you it necessary to take the child to the Hospital for?

Did you have any unanswered questions about this? Yes [__] No [__]

Did you tell the health workers? Yes [__] No [__]

If No, why didn't you ask the health workers your questions?

On the Treatment of the Child

Did they provide any treatment to the child before leaving the health services to take it to the Hospital? Yes [__] No [__]

Why did the health workers give you this (these) drug(s)?

Did they tell you what each of these drugs was for? Yes [__] No [__]

What did they say the drugs were for?

1. [_____] 2. [_____]

3. [_____] 4. [_____]

Did they explain to you what care should be given to the child while it was being transferred to the Hospital? Yes [__] No [__]

What care did they tell you to provide for the child?

How did you take care of the child during its transfer to the Hospital?

Observations:

ANNEX 22.D
REGISTRATION FORM: CARE OF THE CHILD AGE 1 WEEK TO 2 MONTHS

Date: __/ __/ - __/ __/ - __/ __/ __/ __/

Name: _____ Age: _____ Weight:_____kg Temperature: _____ °C

Ask: What are the child's problems? _____ Initial visit? ____ Follow-up consultation? ____

ASSESS (Circle all signs present)	**CLASSIFY**	**TREAT**
CHECK FOR POSSIBLE BACTERIAL INFECTION • Has the child had convulsions? • Count breaths in one minute. _____ breaths per minute. Repeat count _____ Fast Breathing? • Determine for severe chest indrawing. • Determine if there is nasal flaring. • Determine if there is grunting. • Examine the fontanelle and feel it to see if it is bulging. • Determine if there is pus draining from the ears. • Observe the umbilicus. Is it red or draining pus? Does the redness extend to the skin? • Is there fever (temperature of 38 °C or more or feels warm to the touch) or low body temperature (below 35.5°C or cool to the touch)? • Look for skin pustules. Are they abundant or widespread? • Determine if the child is lethargic or unconscious. • Observe the child's movements. Less than normal? **NONE OF THESE SIGNS** [___]		
DOES THE CHILD HAVE DIARRHEA? **Yes** [___] **No** [___] • For how long? _____ days • Is there blood in the stool? • Determine the general condition of the child. Is the child: Lethargic or unconscious? Restless or irritable? • Determine if it has sunken eyes. • Skin pinch sign. The skin returns to the previous state: Very slowly (more than 2 seconds)? Slowly?		
IMMEDIATELY, CONFIRM WHETHER THERE ARE PROBLEMS OF FEEDING OR LOW WEIGHT • Does the child have any difficulty feeding? Yes [___] No [___] • Is it breastfed? Yes [___] No [___] If the response is yes, how many times in 24 hours? [_____] times • Does it usually receive other food or fluids? Yes [___] No [___] If the response is yes, how often? • What do you feed the child with? Do you use a feeding-bottle? • Determine weight for age. Low [___] Not Low [___]		

If the child has any difficulty in being fed, if breastfed less than 8 times every 24 hours, if it takes any other food or fluid, or has low weight for age and does not present any sign for which it should be URGENTLY referred to the hospital:

ASSESS BREASTFEEDING:

- Was the child breastfed during the last hour? If the child has not been fed in the previous hour, ask the mother to bring the child to her breast. Observe the breastfeed for 4 minutes.
  - Is the child in a good position? Yes [___] No [___]
  - Did the child manage to hold on well? To confirm grasping, observe if:
    - chin touching breast Yes [___] No [___]
    - mouth wide open Yes [___] No [___]
    - lower lip turned outward Yes [___] No [___]
    - more areola visible above than below the mouth Yes [___] No [___]

  [___] *no attachment* [___] *not well attached* [___] *good attachment*

- Does the child breastfeed well (that is, does it suck intensely and slowly, with occasional pauses)?

[___] *not suckling at all* [___] *not suckling properly* [___] *suckling properly*

- Determine the child has ulcers or white patches the mouth (thrush)

CONFIRM THE VACCINATION HISTORY OF THE CHILD

Circle vaccines that will be administered today. BCG OPV0

Return for the next vaccine the:

_____

(Date)

ASSESS OTHER PROBLEMS:

Return for follow-up on:
__/ __/ – __/ __/ – __/ __/ __/ __/

Administer the vaccines that are appropriate for today: [_____]

_____

NAME AND SIGNATURE

REGISTRATION FORM
CARE OF CHILD AGED 2 MONTHS TO 4 YEARS

Date: __/ __/ - __/ __/ - __/ __/ __/ __/

Name: _____ Age: _____ Weight:_____kg Temperature: _____ °C

Ask: What are the child's problems? _____ Initial visit? ____ Follow-up consultation? ____

ASSESS (Circle all signs present)		**CLASSIFY**	**TREAT**
CONFIRM IF THERE ARE GENERAL DANGER SIGNS CHILD CANNOT DRINK OR NURSE CONVULSIONS VOMITS EVERYTHING LETHARGIC OR UNCONSCIOUS	**Remember to use danger signs when conducting the classification**	Is there a general danger sign? Yes [___] No [___]	**Remember to refer every child who presents at least one danger sign, even if it does not fit into the framework of the severe classification.**
IS THE CHILD COUGH ING OR DOES IT HAVE DIFFICULTY BREATHING? **Yes** [___] **No** [___] • For how long? ___ days	• Count breaths per minute. ___breaths per minute. Rapid breathing? • Observe if there is subcostal indrawing. • Observe and listen if there is stridor. • Observe and to listen for wheezing.		
DOES THE CHILD HAVE DIARRHEA? **Yes** [___] **No** [___] • For how long? _____ days • Is there blood in the stool?	• Determine the general condition of the child. Is the child: Lethargic or unconscious? Restless or irritable? • Determine if it has sunken eyes. • Skin pinch sign. The skin returns to the previous state: Very slowly (more than 2 seconds)? Slowly?		
DOES THE CHILD HAVE FEVER? (Determined by questioning, if child feels warm to the touch if it has an axillary temperature of 37.5 °C or more) **Yes** [___] **No** [___] Area with risk of malaria • For how long [___] days • If more than 7 days, has it had fever every day?	• Determine if has a stiff neck		
DETERMINE IF THERE ARE SIGNS OF BLEEDING	• Observe if it has signs of bleeding: petechiae, ecchymoses, epistaxis hemorrhagic gingivitis, digestive bleeding, or other		
IS THERE WIDESPREAD RASH	• Determine the child has maculopapular rash, non-vesicular • One of the following signs: cough, runny nose, or red eyes		
DOES THE CHILD HAVE AN EAR PROBLEM? **Yes** [___] **No** [___] • Does it have earache? • Does it have pus draining from the ear? If so, since for how long? [___] days	• Observe if there is pus draining from the ear. • Feel behind the ear to determine if there is swelling painful to the touch.		

IMMEDIATELY, CONFIRM IF CHILD PRESENTS MALNUTRITION AND ANEMIA

- Determine if there are signs of severe visible emaciation.
- Determine if it has palmar pallor. Is it severe? Is it slight?
- Confirm if there is oedema in both feet.
- Determine weight for age. Very low [___] Not very low [___]

CONFIRM THE VACCINATION BACKGROUND OF THE CHILD

Circle vaccines that will be administered today:

[___]	[___]	[___]	[___]	[___]	[___]	[___]	[___]	[___]
BCG	DPT 1	DPT 2	DPT 3	Measles	OPV 0	OPV 1	OPV 2	OPV 3

Return for the next vaccine the:

_____

(Date)

ASSESS THE CHILD'S FEEDING IF IT IS ANEMIC OR HAS SEVERE MALNUTRITION or if it is less than 2 years old.

Feeding Problems:

- Do you breastfeed the child? Yes [___] No [___]
  If you do breastfeed, How many times a day? [___] times.
  Do you breastfeed at night? Yes [___] No [___]
- Does the child take other food or some other fluid? Yes [___] No [___]
  If response is yes, What food or fluids?

_____

_____

How many times a day? [___] times.
What do you use to feed the child? [_____] Do you use a feeding-bottle? Yes [___] No [___]
How large are the portions you give the child? [_____]
Does the child get its own portion? Yes [___] No [___] Who feeds the child and how? [_____]

- During this disease, did the child's feeding change? Yes [___] No [___]
  If there was a change, what was the change with regard to what the child eats normally?

ASSESS OTHER PROBLEMS:

Return for follow-up on:
__/ __/ – __/ __/ – __/ __/ __/ __/

Indicate to the mother if she should return immediately.

Administer the vaccines that are appropriate per the vaccination schedule.

Provide orientation on feeding:

Return for follow-up on:
__/ __/ – __/ __/ – __/ __/ __/ __/

Administer the vaccines that are appropriate per the vaccination schedule.

_____

NAME AND SIGNATURE

PROTOCOL 23

IMPACT OF THE IMCI STRATEGY ON VACCINATION COVERAGE OF CHILDREN UNDER 5

INTRODUCTION

Vaccinations are the chief preventive measure available to reduce the risk of disease and death in children under 5. In most countries, vaccines against poliomyelitis, measles, tuberculosis, diphtheria, tetanus, and whooping cough are administered free of charge and are included in the compulsory vaccination series. Many countries have also included others in their vaccination schedules, directed to the prevention of mumps and rubella, as well as to the prevention of pneumonia, sepsis, and meningitides due to *Haemophilus influenzae*.

Application of these vaccines has helped reduce cases of these diseases and deaths and, in some instances, has permitted the eradication of the problem in many countries and in some regions of the world. In the region of the Americas, for instance, the circulation of the wild poliovirus —- cause of poliomyelitis—- has been eradicated and it is in the process of eradicating the indigenous circulation of the measles virus.

The control of vaccine-preventable diseases basically depends on the achievement of a high vaccination coverage in the susceptible population, to ensure that even when cases do occur, they do not lead to outbreaks of the disease, since only a small number of people are likely to become ill.

Huge campaigns have been implemented to achieve this high vaccination coverage, and bringing the vaccines to a large number of susceptible people over a brief time period. Support for this high coverage has been closely associated with the continuous availability of vaccines and their administration through the health services network. To this end, the importance of reducing *missed opportunities for vaccinations* has been emphasized, especially in recent years; these are understood as any occasion on which a person contacts a health service or workers and the occasion is not used to confirm vaccination status and apply (or program application of) the vaccines.

The Integrated Management of Childhood Illness strategy includes care for every child visiting the health services, verification of its vaccination status, and application of the necessary vaccines. Considering that this strategy is applied to all health services consultations by children under 5, it is expected that systematic implementation of the strategy will help greatly reduce missed opportunities for vaccinations and will improve the vaccination coverage of children in the area covered by each service or health worker.

OBJECTIVE

Determine the impact of implementation of the IMCI strategy on the coverage of vaccination of children under 5.

METHODOLOGY

One or more health services should be selected, with a sufficient number of children whose vaccination status will be assessed before and after implementation of the IMCI strategy. Implementation of the IMCI strategy should ensure the systematic implementation of the IMCI steps prescribed for the assessment, classification, and treatment of children under 5 who visit the health services, including the component of assessment of the vaccination status of the child and application of the necessary vaccines so that the child has the full schedule appropriate for its age.

Proper implementation of this component is essential in order to determine the impact of the IMCI strategy on the vaccination status of children under 5 who are cared for in the health services. This component includes application of the vaccines that are necessary (depending on the age of the child) and education of the mother during the consultation and afterwards to promote application of the vaccines at the recommended age and avoid delays in the vaccination series. These activities include talks, meetings, and other types of personal communications in the health services or in the community.

Verification of the vaccination status could also include the organization of a follow-up mechanism directed toward identifying children with delays in the completion of their vaccination series, such as a calendar record, as well as active searches for children who need the appropriate vaccines.

The study of the vaccination coverage before and after implementation of the IMCI strategy can be conducted in basically two ways:

- Follow-up of the vaccination series of the children in the community being served by the health services.

- Follow-up of the vaccination series of children who visit the health services.

The first way to obtain this information is best for understanding the coverage situation, but it should be remembered that if many children in the community are not going to the health services selected for the study (because they simply are not used by the population or because they use other health services), implementation of the IMCI strategy in that service will not modify the situation. Other activities should be implemented, including active search in the community, or the implementation of the IMCI strategy should be extended to all health services used by the target population of the study.

Assessment of the vaccination coverage before and after applying the IMCI strategy, based on the children who visit the health services, makes it possible to observe the direct effect of the activity of the service, but this result cannot be extrapolated to the remainder of the population.

Procedures

➢ If the study is conducted in the community one should:

- Select the areas to be studied, based on the user population or population covered by the services participating in the study; and determining whether the total population is to be studied, or just a sample.

- Calculate the sample size necessary for the study, as a function of the vaccination coverage that it is hoped to find and the increase hoped for during the period of the study. Vaccination coverage can be studied for each individual vaccine included in the scheme, or for all the vaccines. This can be broken down further if vaccines were administered within the recommended age or if there are delays in applying them. If such a breakdown is conducted, the sample size for each different group needs to be calculated. See the Module of Support in Statistical Methodology of Part II on studies to Compare the Situation Before and After Implementation of the IMCI strategy.

- Define the methodology that will be used to obtain a random sample that is representative of the population being studied. This should be completed both for the initial and the follow up study in order to evaluate the impact of the implementation of the IMCI strategy. See the Module of Support in Statistical Methodology of Part II.

➢ If the study is conducted in the health services, one should:

- Determine whether the vaccination coverage of the entire infant population who attend the health services, is to be studied, or just a sample. It is always advisable to study the largest possible number of children; the selection of this number should be based on the vaccination coverage expected to be achieved and the anticipated impact from implementation of the IMCI strategy.

- Define the mechanism to be used for recording the information on the vaccination status of children who consult and precautions taken to ensure that the same child is not assessed more than once. If the study is conducted on the basis of the registries available in the health services, ways can be found to ensure that the same child is not counted twice. However, if the study is conducted based on the registries in the possession of the mother, for example, a Vaccination Card, an identification mechanism needs to be used to avoid the risk of counting the same child twice (for example, a list identifying every case and a mark on the Vaccination Card included in the study).

➢ Whatever the type of study (community-based or in the health services), the following steps should be included:

- Ask the child's mother for the Vaccination Card or any other registry being used to allocate application of vaccines to the child, either at home (if the study is conducted in the community) or at the consultation (if the study is conducted in the health services).

- Based on the Card, confirm which vaccines have been administered to the child and determine whether it has received the full vaccination series for its age. To this end, a decision should be made on how to count children with delays in their vaccination series, especially in regard to multi-dose vaccines. For example, a child who began its polio and triple vaccines scheme when it was 4 months old and who is currently 5 months old, has a delay in the vaccination series—-it does not, however, have an incomplete scheme, since it doesn't need to receive the second dose of either vaccines until it is 6 months old. It is advisable, in this regard, to conduct an assessment only if the vaccination series is complete and, if included in the study, to conduct a separate assessment of the delay in the beginning of the scheme.

- Note the results of the verification of the child's Vaccination Card of the child and record whether it has been included in the study, in order to avoid counting the same child twice. Annex 23.A includes a model Worksheet to record the results.

- Repeat this procedure the number of children determined to be necessary for the sample has been assembled.

- This procedure, finally, should be repeated some time after having implemented the IMCI strategy in the health services, in order to be able to evaluate its impact on vaccination coverage.

Annex 23.B includes a model Table for Consolidation of the Information, instructions for filling out the Table, and the suggested indicators. The information from the Table can be used to calculate the indicators of vaccination coverage for each age group and for each vaccine. In this case, it should always be remembered that the child should have received all doses appropriate for multi-dose vaccines.

In order to calculate the indicators, cases in which there was no information concerning the vaccination status should be ruled out. To do this, subtract the numbers in the last column (**No Information**) from the numbers in the second column (**Total Children Studied**). The result of the subtraction will be used as the denominator.

If the proportion of children whose vaccination status is unknown is high (more than 40%), the results of the study will be limited. Table 23.1 includes some examples of indicators that can be calculated, as well as the formula for the calculation.

Finally a hypothesis test should be conducted for the selected indicators, in order to discover whether implementation of the strategy produced changes in the components being studied. In order to calculate this test please refer to the Part II, the Statistical Methodology Support Module.

Special Considerations

- The health services should have implemented a system for registry of the vaccination of the children, which should include providing families with a Vaccination Card (especially if the study being conducted is community-based).

- Assessment of the vaccination status of the child should be a standard practice in child consultations, regardless of the cause for which the mother seeks consultation, and this practice should be known to the community, so that mothers and other home care providers will bring the Vaccination Card with them to the consultation.

- It is best if the assessment of the strategy's impact confirms, during the second assessment, whether the children identified as having incomplete schemes during the first assessment now have their complete scheme. This will make it possible to confirm whether the health services are effectively following-up the vaccination series of children who consult, and if they are proceeding in accordance with the findings (this is, vaccinating the children with incomplete schemes or programming and making the vaccination effective).

Table 23.1

INDICATOR	NUMERATOR	DENOMINATOR
Proportion of all children studied who have the complete vaccination series for their age	Total number of children with the complete series for their age	Total number of children studied **minus** the number of children studied with no information on vaccination status
Proportion of children under 1 month vaccinated with BCG	Number of children under 1 month vaccinated with BCG	Number of children under 1 month studied **minus** the number of children under 1 month with no information on BCG vaccination status
Proportion of children between the ages of 12 to 18 months with complete vaccination series for their age	Number of children between 12 to 18 months with all vaccines appropriate for their age applied	Total number of children between the ages of 12 to 18 months studied **minus** the number of children between the ages of 12 to 18 months with no information on vaccination status

ANNEX 23.A
WORKSHEET FOR FOLLOW-UP OF THE VACCINATION SERIES

Health Services: _____ Period/Year: _____

Surname and Names	AGE	BCG	Sabin					Triple (DPT)					Anti-measles vaccine	TOTAL
			1st.	2nd.	3rd.	1st. Booster	2nd. Booster	1st.	2nd.	3rd.	1st. Booster	2nd. Booster		

Observations:

ANNEX 23.B
VACCINATION COVERAGE
TABLE FOR CONSOLIDATION OF THE INFORMATION

Health Services: _____ Period/Year: _____

AGE GROUP	TOTAL CHILDREN STUDIED	COMPLETE SCHEME	VACCINES				NO INFORMATION
			BCG	SABIN	TRIPLE	ANTI MEASLES	
TOTAL							
<1 MONTH							
1–3 MONTHS							
4–5 MONTHS							
6–11 MONTHS							
12–17 MONTHS							
18–23 MONTHS							
2–4 YEARS							

Observations:

To Fill out the Table for Consolidation of the Information:

The Table should be filled out during the assessment of the vaccination status conducted by the health workers during the consultation. This table does not include the identification of every child who is included in the study; therefore, in order to avoid including the same child more than once (if the study is conducted during a period of several days of duration), the child's Card should be marked or identified, making it possible to identify it in future consultations. If so desired, the child may also be identified in the registry filled out in the health services. A worksheet should be used similar to the model in Annex 23.A. In order to fill out the Table for Consolidation of the Information, do as follows:

1. Fill out the top part of the Table, writing in the name of the health services, and the period (week, month, months and the year) pertaining to the information. If the registry was used during several days, note the beginning date of the period and, once the entire table has been filled out, the end date.

2. When conducting the verification of the vaccination status of the child, ask for the child's Vaccination Card.

3. Identify the age group to which the child belongs and select the appropriate row. Always mark the second column of that row, as appropriate for the total number of children of that age whose group vaccination status is assessed.

4. Take note of the vaccination status of the child with regard to each vaccine, taking into account the recommended application age in the Vaccination Schedule used at that place, and the age of the child.

5. For each vaccine that should be applied to the child as a function of its age, mark (|) the appropriate box at the intersection of the row selected, based on the age of the child and the column pertaining to the vaccine, if the child has already been administered the vaccine. If the matter involves a multi-dose vaccine, make a mark only if the child has been applied all doses that are appropriate for its age. In dealing with multi-dose vaccines, if there was a delay in the child's starting with its vaccination series, consider it as having the complete scheme only if at the time of the assessment the child had received the doses that were necessary based on the aforementioned scheme. (For example, a 5 month old child who at the time of the assessment has initiated the Sabin and triple vaccination series with the first dose at 4 months, will be considered as having the complete scheme). If at the time of the assessment of these children new delays should arise in the administration of the followup doses, consider the scheme as being incomplete.

6. If the child does not have the complete scheme for one or more vaccines, do not mark the box for that vaccine.

7. If the child has the complete scheme for all vaccines that should have applied in accordance with its age, mark the third column, in the appropriate box for the row which includes the age of the child.

8. If there is no information on the vaccination status of the child, mark the last column, always in the appropriate box for the row in which the age of the child is included.

9. Having completed the inspection of the vaccination status of all the children who consulted during the entire period, the number of marks (|) in each box of the Table should be added and the sum in each one recorded.

10. The numbers in the boxes of each column should then be totaled and the sum recorded in the appropriate row for the Total.

PROTOCOL 24

IMPACT OF THE IMCI STRATEGY ON NUTRITIONAL MONITORING OF CHILDREN UNDER 5 YEARS OF AGE

INTRODUCTION

Malnutrition is one of the principal risk factors endangering the health of the child, by making it more vulnerable to infections and death. During the first years of life, proper feeding of the child is essential to ensure normal growth and development .Malnutrition is an underlying condition associated with 40-60% of deaths among under-5- year old children in developing countries. Monitoring the growth and nutritional status of the child is very important to ensure the prompt detection of retardation of normal growth, and to take measures to control this situation.

Control of the nutritional status of the child should be conducted frequently —- especially during the first months of life. Controls should continue throughout infancy, and should be conducted periodically until the child is 5 years old.

Despite the importance of monitoring the nutritional status of the child, the health services do not always do so systematically. Often, even though the children are measured and weighed, the data are not used to determine the nutritional status of the child; this is a missed opportunity for the early detection of growth retardation.

Given the importance as a risk factor for illnesses and the aggravation of illness, as well as its being a health problem in the children of developing countries, the control of nutritional status is part of the Integrated Management of Childhood Illness strategy. Implementation of the IMCI strategy in the health services helps to identify problems in the nutritional status of children and to conduct appropriate treatment, thus contributing to reduce the risk of illness in children under 5.

OBJECTIVE

Determine the impact of implementation of the IMCI strategy on the coverage of control of the nutritional status of children under 5.

METHODOLOGY

One or more health services should be selected for an assessment of changes in the control of the nutritional status of the children who consult, due to implementation of the IMCI strategy.

A determination should be made of the number of children under 5 who visit the health services and whose nutritional status is assessed, and what proportion they are of the total consultations conducted by those services for that age group, before and after having implemented the IMCI strategy.

It should be taken into account that implementation of the IMCI strategy in the health services means that children who go to those health services will be systematically weighed (and eventu-

ally measured), and that these determinations will be used to classify their nutritional status, based on the child's placement on the weight for age curve, or based on the methodology the country uses for classification of the nutritional status of children.

In order to calculate the coverage of control of the nutritional status of children who consult, it will be necessary to have access to the records in order to confirm that the monitoring is conducted effectively. Since this requires not only the weight (and height) measurements, but also the child's classification in accordance to the findings, there needs to be a record of both determinations and of how they were used. To this end, the record should note the nutritional classification of the child conducted by the health workers (based on the weight measurement), or the child's placement on the weight for age curve at the consultation visit.

This information can be obtained from different sources depending on the health services, including:

- The Clinical History of the child or any other registry with the weight for age curve in order to identify measurements taken during the child medical visits and follow ups through the years.

- The outpatient consultation record, or the weight for age curve, or a space provided for health workers to indicate the nutritional classification received by the child in consultation.

- The information could also be obtained from the Child Card in the mother's possession.

If none of these registries are available, it will not be possible to evaluate whether the health workers conducted the control of the nutritional status of the child or not, so it will be necessary to consider the possibility and necessity of setting up some kind of record system for this purpose.

In order to calculate the size of the sample to be studied and the length of the observation period it is necessary to consider the situation of the problem prior to (or at the beginning of) implementation of the strategy, and the expected impact. The steps for calculating the sample size for the study are described in the Part II, the Statistical Methodology Support Module, with regard to Studies to Compare the Situation Before and After Implementation of the IMCI strategy.

In order to conduct the study, it is suggested to proceed as follows:

1. Select records of consultations of children under 5 appropriate for a given period of time, and assemble a sufficient number of consultations.

2. For each child visit, confirm whether the child was weighed at the consultation (and measured) and if the nutritional status of the child was classified, either by using the weight for age curve, or by annotating the conclusion with regard to the child's nutritional state.

3. The information obtained can be used to calculate the proportion of children seen and whose nutritional status was assessed.

4. This proportion should be calculated before and after applying the IMCI strategy, in order to evaluate whether the implementation of IMCI increased the practice of evaluating the nutritional status of the children in the consultation.

Annex 24.A presents a model Worksheet for Collection of Information based on the registries of the outpatient services.

Annex 24.B presents a model Table for Consolidation of the Information for tabulating the results of the study, and instructions to fill it out.

The information from the Table can be used to calculate the indicators referring to the control of the nutritional status of the children who visit the health services and, if included in the study, to the actual nutritional status of the children who consulted. In this case, it should be remembered that, if a high proportion of the children lack weight (or height) records the nutritional status that is obtained will not be representative of the sample.

The indicators of Table 24.1 are examples. The indicators can be used to calculate the coverage of control of the nutritional status in the health services, either for the total of all children under 5 or for each age group.

Table 24.1

INDICATOR	NUMERATOR	DENOMINATOR
Proportion of children who were weighed in the consultation at the health services out of all children seen.	Total number of children whose weight was registered in the Clinical History or the appropriate medical record	Total number of children seen
Proportion of children who were measured in the consultation at the health services out of all children seen	Total number of children whose height was registered in the Clinical History or the appropriate registry for to the consultation	Total number of children seen
Proportion of children whose nutritional classification was registered in the medical record at the health services out of all children cared for	Total number of children whose nutritional classification was registered in the Clinical History or the appropriate medical record	Total number of children seen

Finally a hypothesis test should be conducted for the indicators that were selected, in order to discover whether implementation of the strategy produced changes in the components being studied. In order to calculate this test please refer to the Part II, the Statistical Methodology Support Module.

Special Considerations

- Execution of this study should take into account that the health services should have implemented a system for recording the weight (and height) of children who consult, as well as the nutritional classification conducted by the health workers based on these data. Otherwise, the results will possibly show that most children have not had their nutritional status assessed, even though this may be simply because it was not registered.

- The study can also include the results of the assessment of the nutritional status of the children who visit the health services, not just whether the assessment was conducted or not. To this end, the same Table for Consolidation of the Information that has been suggested can be used, but the "YES" column under "Nutritional Assessment" should be broken down into the different categories for classifying the nutritional status of the child: severe malnutrition, low weight for age, low weight for age, normal weight for age.

ANNEX 24.A
COVERAGE OF NUTRITIONAL MONITORING OF CHILDREN UNDER 5
DATA COLLECTION WORKSHEET

Health Services: _____ Period/Year: _____

No.	SURNAME AND NAMES	AGE	WEIGHT		SIZE		NUTRITIONAL CLASSIFICATION	
			YES	NO	YES	NO	YES	NO

Observations:

ANNEX 24.B
COVERAGE OF NUTRITIONAL MONITORING OF CHILDREN UNDER 5
TABLE FOR CONSOLIDATION OF THE INFORMATION

Servicio de Salud: _____ Período/Año: _____

AGE FROUP	TOTAL CHILDREN STUDIED	WEIGHT MEASUREMENT		SIZE MESUREMENT		WITH NUTRITIONAL CLASSIFICATION	
		YES	NO	YES	NO	YES	NO
TOTAL							
<2 MONTHS							
2–11 MONTHS							
1–4 YEARS							

Observactions:

To Fill out the Data Collection Worksheet:

1. Fill out the top part of the Worksheet, writing in the name of the health services and the period (week, month, months; and the year) pertaining to the information to be registered.

2. Select the appropriate Daily log or medical record for the first day of the period that will be studied.

3. Review the Record until finding the first child under 5 in the period selected and locate its Clinical History.

4. Write down the data from the Worksheet: surname and name, age, and the following data with regard to the determination of nutritional status: if the weight was registered or not, if the size was registered or not, and if the nutritional classification was registered or not.

5. If there is a decision to assess the nutritional status (not just whether or not it was determined by the health workers) the eighth column of the Data Collection Worksheet (Nutritional Classification: YES) may be broken down into the four nutritional classifications recommended by the IMCI strategy: Severe Malnutrition, Very Low Weight, Low Weight, or Normal. The appropriate column should then be marked (|).

To Fill out the Table for Consolidation of the Information:

1. Fill out the top part of the Table, writing in the name of the health services and the period (week, month, months; and the year) pertaining to the information that will be tabulated.

2. Based on the Worksheet for Collection of the Information, identify the first registered child who visited the health services for consultation. Depending on the age of the child, select the appropriate row from the Table and mark (|) the second column **Total Children Studied.**

   (a) If the child's weight was registered, mark (|) the third column **YES** of the appropriate row for the child's age; if the weight was not found, mark (|) the fourth column **NO.**

   (b) If the child's size was measured, mark (|) the fifth column **YES** of the appropriate row for the age of the child; if the size was not found, mark (|) the sixth column **NO.**

   (c) If the child's nutritional classification was registered based on the clinical data and the weight and age data (and size if appropriate), mark (|) the seventh column **YES** of the appropriate row for the age of the child; if this classification was not found, mark (|) the eighth column **NO.**

(d) If there is a decision also to evaluate the nutritional status (and not just whether it was determined by the health workers) mark (|) the appropriate column —-Severe Malnutrition, Very Low Weight, Low Weight, or Normal—- into which the **YES** of the nutritional assessment has been broken down

3. Having completed the review of the nutritional status of all the children who consulted during the period selected, the number of marks (|) in each box of the Table should be added and the resulting sum written down.

4. Total the numbers contained in the boxes of each column to obtain the figures for the second **Total Row** and check to ensure that they are consistent with the total number of marks for each age group in the second **Total Column.**

PART VI

STUDIES ON TECHNICAL STANDARDS FOR CASE MANAGEMENT UNDER THE IMCI STRATEGY

PROTOCOL 25

VALIDITY OF CLINICAL SIGNS FOR THE ASSESSMENT AND CLASSIFICATION OF ANEMIA IN CHILDREN UNDER 5 YEARS OF AGE

INTRODUCTION

Anemia is a major health problem due to its marked influence on the normal growth and development of children. In the developing countries anemia is related to various factors, including nutritional iron deficiency, intestinal parasites or malaria infection in endemic areas . Severe anemia contributes to an increased risk of mortality and children with milder anemia are prone to more severe infections, growth and psychomotor delay.

Early detection and adequate treatment are effective methods for reducing the prevalence of anemia in children and diminishing its importance as a risk factor to normal child growth and development. Nevertheless, early detection of anemia requires the use of laboratory techniques to determine the mean corpuscular hemoglobin concentration, since the clinically observable signs and symptoms do not appear until there has already been a marked decline in this indicator.

In many developing countries, laboratory techniques for the early diagnosis of anemia are not accessible to most health services; many cases of anemia are thus detected only after the mean hemoglobin concentration (Hgb) has sunk to very low levels. In view of the fact that this is associated with a higher probability of complications and risks for the child, the utilization of clinical signs and symptoms to assess the presence or absence of anemia is of major importance.

The IMCI strategy proposes to assess the presence or absence of anemia in children aged 2 months to 4 years old through observation of the *palmar pallor sign.* If palmar pallor is *severs(the skin of the palm is very pale or so pale that it looks white).* The case is then classified as *severe anemia,* if there is only some palmar pallor the child is classified as having *anemia.* In view of the fact that this sign can be used by properly trained health workers, and that it does not require use of a laboratory, this type of assessment is of great help in diagnosing anemia better and case management of these children.

OBJECTIVES

General Objective

Determine the validity of the *severe palmar pallor* and *some palmar pallor* sign for the identification of children from 2 months to 4 years with *severe anemia* and *anemia.*

Specific Objectives

- Determine the sensitivity and specificity of the *severe palmar pallor* sign and hemoglobin concentration of less than 5 grams per deciliter in children aged 2 months to 4 years.

- Determine the sensitivity and specificity of some *palmar pallor* sign and hemoglobin concentration between 5 and 11 grams per deciliter in children aged 2 months to 4 years.

- Determine the sensitivity and specificity of the *no palmar pallor* sign and hemoglobin concentration higher than 12 g/dL in children aged 2 months to 4 years.

- Establish the relationship between anemia and hemoglobin concentration less than 5 grams per deciliter (Severe Anemia) and the classifications of the IMCI strategy that would indicate referral to the Hospital (general danger signs, severe pneumonia or very severe disease, severe persistent diarrhea, very severe febrile disease, severe measles with complications, mastoiditis, severe malnutrition).

The hemoglobin concentrations that define the presence of anemia and severe anemia can be adjusted to match the standards used in the country or area of the study.

METHODOLOGY

Population enrolled in the Study

The study will focus on children aged 2 months to 4 years who visit the health services and who are classified by health workers as having *severe palmar pallor* or *some palmar pallor.*

For each child included in the study, another child will be selected whom the health workers have not classified as displaying *severe palmar pallor* or *some palmar pallor*, and who has the same characteristics in terms of age, sex, race, nutritional status, and disease classification (except for anemia).

The proposed methodology —-of pairing cases and control subjects—- makes it possible to determine the sensitivity and specificity of the palmar pallor sign to detect anemias; however, it does not make it possible to determine the predictive value of the sign. Annex 25.B presents a brief outline of the methodologies to validate clinical signs.

Criteria for Selection of the Health Services and Personnel Who Will Conduct the Study.

The health services participating in the study should receive a high number of consultations by children between the ages of 2 months and 4 years. They should have access to methods to determine the mean corpuscular hemoglobin concentration; to this end, it is suggested that a micromethod be employed which analyzes whole blood obtained by digital puncture.

The environments in which the consultation is conducted should all be at the same temperature, in order to avoid potential errors associated with variations in room temperature.

The observers who conduct the study will receive prior training in the application of the IMCI strategy in general and, especially, in the assessment of these severe *palmar pallor* and *some palmar pallor* signs.

After training, the observers should be assessed by a reference reader in order to determine how closely the observer's classification matches the reference reader's. A set tolerance should be established for the consistency; observers who fail to meet it should not participate in the study.

It is recommended that the consistency rate also be monitored throughout the duration of the study, by randomly selecting some of the children assessed and classified by each participating observer; these children should also be assessed and classified by the reference reader. In this selection process, children classified by the observer as displaying *severe palmar pallor*,some *palmar pallor*, or *no palmar pallor* should be included.

In the event that the consistency rate of an observer is unacceptable (under 90%) during the study, cases included in the study through this observer will be discarded (including cases classified as *severe palmar pallor* and some *palmar pallor*, along with those which were not so classified by that observer but were also included).

Size of the Population to be Studied

As a basis, it is considered advisable to obtain at least 100 children classified as displaying *severe palmar pallor* and another 100 children classified as displaying *some palmar pallor.* However, these figures should be adjusted to reflect the number of different groups into which one wants to break down the total sample, in order to study possible variations in the association of the signs with the Hgb level, as a function of variables such as:

- Age of the child (2-11 months, 1 year, 2-4 years)
- Race
- Nutritional status
- Classification per the IMCI strategy (for example, very severe disease, malaria, or classifications that only require symptomatic treatment in the home

Data Record and Processing

Information can be recorded using the Recording Form for the Care of Children Aged 2 months to 4 Years of the IMCI strategy for assessment, classification, and treatment. This provides statements on the indications present in the child, and the classification of the child's clinical history.

In view of the fact that children classified as displaying *severe palmar pallor* and some *palmar pallor* will be studied in the laboratory to determine the Hgb, it is necessary to organize how the registries of these children will be filled out in order to record their results.

Likewise for the manner in which an equal number of control children (classified as displaying *no palmar pallor* by the health workers) are to be studied, along with the form on which their MCHg results will be recorded.

It is suggested, in both cases, to record the value obtained by the laboratory determination in the box reserved for recording the classification pertaining to the box *Immediately check for malnutrition and anemia*, of the Recording Form for Care of Children Aged 2 months to 4 years.

The Table in Annex 25.A is proposed for systematizing the information referred to the first three specific objectives. To systematize the information with regard to the fourth specific objective specific, an extra column can be added to the table (**Referred to Hospital**), corresponding to all children included in the study who were referred to the hospital for any classification.

To Calculate the Indicators

The information from the Table for Consolidation of Information can be used to calculate the sensitivity and specificity of the signs of *severe palmar pallor* and *some palmar pallor*, using the MCHg obtained in the laboratory as the *"gold standard*" The formulas for these calculations are in Annex 25.B.

The proportion of children with anemia and severe anemia detected by observing palmar pallor by trained observers and controlled by a reference reader can thus be determined.

Table 25.1 includes some examples of indicators that can be calculated, as well as the formula used for the calculation. The indicators are included only by way of example; other ratios based on the data of the Table of Annex 25.A can also be calculated. In all cases, it should be recalled that the indicators may be calculated for every age group.

Table 25.1

INDICATOR	NUMERATOR	DENOMINATOR
Sensitivity of the severe palmar pallor sign for the diagnosis of severe anemia	Number of children with severe palmar pallor and with <5g/dL Hgb	Total number of children with <5gr/dl Hgb
Sensitivity of some palmar pallor sign for the diagnosis of anemia	Number of children with some palmar pallor and with Hgb 5-11g/dL	Total number of children with Hgb 5-11gr/dl
Specificity of the severe sign for the diagnosis of severe anemia	Number of children without severe and with Hgb of 5g/dL or more	Total number of children with Hgb>5g/dL
Specificity of the some pallor sign for diagnosis of anemia	Number of children without some pallor sign and with Hgb of 5-11g/dL	Number of children with MCHg <5gr/dl + Number of children with Hgb 12 or more g/dL
Sensitivity of the palmar pallor sign (sever and some) for the diagnosis of anemia	Number of children with some type of palmar pallor and with <12g/dL Hgb	Number of children with <12/dL Hgb
Specificity of the palmar pallor sign (severe and some) for the diagnosis of anemia	Number of children without any type of palmar pallor and with Hgb of 12 or more g/dL	Number of children with Hgb of 12 or more g/dl
Proportion of children with Hgb<5g/dl referred to the hospital for any cause, regardless of the palmar pallor classification	Number of children with Hgb<5g/dl referred to the hospital	Total number of children with <5g/dL Hgb

ANNEX 25.A
STUDY OF RELATIONSHIPS BETWEEN PALMAR PALLOR AND HEMOGLOBIN CONCENTRATION IN CHILDREN AGED 2 MONTHS TO 5 YEARS

TABLE FOR CONSOLIDATION OF THE INFORMATION

Health Service: _____ Period/Year: _____

	<5g/dL Hgb	5-11g/dL Hgb	Hgb≥ 12g/dL	TOTAL
INTENSE PALMAR PALLOR				
MILD PALMAR PALLOR				
NO PALMAR PALLOR				
TOTAL				

Observations:

Instructions for Filling the Table for Consolidation of the Information

The Table for Consolidation of the Information can be used to systematize all the information collected. A table may be also used for each group into which the population under study will be broken down. For example, if the population being studied is divided into different age groups, a Table should be used for each age group. If the population being studied is broken down as a function of variables (sex, race, time of year, etc.) there should be as many tables as there are groups.

In order to fill out the Table proceed as follows:

1. Fill out the top part of the table, indicating the health services and period in which the study was conducted.

2. Go to the first individual registry to be included in the study and note:

   2.1. The health workers' classification regarding the palmar pallor sign

   2.2. The Hgb obtained.

3. Choose the appropriate row for the record, according to the palmar pallor classification (severe Palmar pallor, some Palmar pallor, or No Palmar pallor).

4. Record the laboratory-obtained MCHg result and define the appropriate column, according to whether it is "<5g/dL" or "5-11g/dL or ">12 g/dL."

5. Mark (|) the box selected per the above.

6. Proceed likewise with all the separate registries.

7. Once the review of all registries is done, add all the marks (|) in each box of the table; write down the resulting sum in each one.

8. Then add the appropriate boxes to obtain the totals for the fifth row.

9. If the fourth specific objective is being studied, the table can be adapted by dividing all the columns into two subsidiary columns: **Referred to Hospital** and **Not Referred to Hospital.** In this case, the final treatment decision taken by the health workers should be confirmed for each child in the study, in order to decide in which subdivision of the column to place the mark (|).

ANNEX 25.B

METHODOLOGY FOR VALIDATION OF CLINICAL SIGNS

The methodology proposed in Protocol 25 to validate palmar pallor as a sign of anemias is a case and control study: for each case with palmar pallor that enters the study, a control is selected that does not have palmar pallor but that has all other characteristics of the case. This methodology, which is appropriate to study risk factors for disease, is useful to measure the sensitivity and specificity of clinical signs. It does not, however, make it possible to determine the predictive value of the signs to diagnose diseases.

In the studies on risk factors a control (without the disease) is selected for each case of the disease; there can be more than one. By comparing pairs in which the risk factor is present in the case but absent in the control, along with reverse pairs, in which the risk factor is present in the control and absent in the case, it is possible to measure the relative risk or probability of occurrence of the disease in individuals with the risk factor by comparison with those who do not have it.

In the studies on validation of clinical signs, the objective is to determine the pathognomonic value of the signs in the population where it is being applied. For example, the objective of Protocol 25 is to determine the value of the palmar pallor sign to detect anemia in children under 5 who visit primary care health services. The cases are children in whom palmar pallor is observed while the controls are all the other children in whom palmar pallor is not observed during the period in which the study is conducted. The predictive value of the palmar pallor sign depends on the sensitivity and specificity of the sign, and on the prevalence of anemia in that group of individuals visiting the services. If twinned controls are chosen, an artificial population is created in which 50% have the palmar pallor sign, so the prevalence of anemia may be much higher than in reality, and the predictive value of the sign will be fallacious.

For example, in a study of 10,000 children with high values for palmar pallor sensitivity (90%) and specificity (95%):

- If the prevalence of anemia is 50%, the positive predictive value of the palmar pallor sign to identify anemia is 94.7%;
- If the prevalence is 10%, the positive predictive value is 66.7%;
- If the prevalence of anemia is 1%, the positive predictive value is 15.4%.

Thus, the objectives of Protocol 25 are limited to measuring the sensitivity and specificity of the palmar pallor sign to detect anemia. If you wish to determine the positive and negative predictive values, the methodology should be modified. The controls would be all children with No Palmar pallor who were cared for in the outpatient consultation during the selection period for the cases. Since the hemoglobin concentration study should be conducted in all cases and controls, this can entail problems of feasibility and cost.

If only 1% of children who visit the services has palmar pallor and the controls must be the remaining children (99%), there must be statistical certainty on how to determine the study sample. Once the complete sample has been determined, including cases and controls, the feasibility

of the study can be enhanced while diminishing the cost of hemoglobin studies, by selecting a representative subsample of the controls. Thus the hemoglobin studies would be conducted in all cases and in the control subsample.

The results of the study can be summarized in a 2x2 table, which facilitates the calculations of sensitivity, specificity, and predictive value.

TABLE ON VALIDITY OF THE MILD PALLOR PALM SIGN TO IDENTIFY CASES OF ANEMIA

		Hemoglobin Concentration		TOTAL
		<55g/dL + ≥12g/dL (-)	5 - 11 g/dL (+)	
Mild Palmar Pallor Sign	Present (+)	a	b	a + b
	Absent (-)	c	d	c + d
TOTAL		a + c	b + d	a + b + c + d

Sensitivity = a/a+c = $\frac{\text{Children with positive sign and MCHg positive}}{\text{Total children with MCHg positive}}$

Specificity = d/d+b = $\frac{\text{Children with negative sign and MCHg negative}}{\text{Total children with negative MCHg}}$

Positive Predictive Value = a/a+b = $\frac{\text{Children with positive sign and MCHg positive}}{\text{Total children with positive sign}}$

Negative Predictive Value = d/c+d = $\frac{\text{Children with negative sign and MCHg negative}}{\text{Total children with negative sign}}$

PROTOCOL 26

CONSISTENCY IN THE IDENTIFICATION OF THE PALMAR PALLOR SIGN AMONG HEALTH WORKERS TRAINED IN THE APPLICATION OF THE IMCI STRATEGY

INTRODUCTION

The use of simple signs to assess the presence of anemia in children under 5 is very important since it reduces the need to rely on laboratory techniques, which are often unavailable to the health services that the population visits. However, the use of such signs is limited not only by their sensitivity and specificity in identifying children with anemia, but also by the variability of the identification, even for same observer, and for different observers.

The strategy of Integrated Management of Childhood Illness proposes using the palmar pallor sign to identify children with some degree of anemia, differentiating among children with *severe palmar pallor* as having severe anemia and children with some *palmar pallor* as having anemia. This sign has been useful in identifying children with anemia, but it is important to assess the degree to which the health workers trained to apply the strategy are capable of correctly identifying the sign.

OBJECTIVE

Determine consistency in the identification of the *severe palmar pallor* and *some palmar pallor* signs by staff trained in the clinical course of the IMCI strategy.

To this end, the following is proposed:

- Establish the consistency —-between the trained staff and a reference reader—- in the identification of the *severe palmar pallor* and some *palmar pallor* signs.

- Establish the consistency among different trained staff in the identification of the *severe palmar pallor* and *some palmar pallor* signs.

METHODOLOGY

Population enrolled in the study

The population to be studied will be the health workers trained in the application of the IMCI strategy, who will be asked to assess the *severe palmar pallor* and *some palmar pallor* signs in children aged 2 months to 4 years who visit the health services.

The health workers involved in the study should have taken the IMCI clinical course, whose theoretical and practical contents include the assessment, classification, and treatment of anemia based on the palmar pallor sign.

The population to be studied can be broken down as a function of other variables, such as profession (general practitioners, specialized physicians, nurses), having received or not a supervi-

sory visit, type of health services in which they serve (hospital with laboratory, hospital without laboratory but with access to one, health center with access to laboratory, hospital or health center without laboratory access), etc.

It is very important to take into account the characteristics of the training course conducted by the personnel included in the study (they should be similar unless this is a variable of the study), as well as full attendance by the personnel in the activities planned.

Assessment

The health workers selected to participate in the study should assess the presence or not of the *severe palmar pallor* and some *palmar pallor* signs in children aged 2 months to 4 years who visit the health service. A reference reader will verify the personnel's classification; this person may be evaluated per Protocol 25 with regard to consistency between different observations and the mean corpuscular hemoglobin concentration.

The assessment should prevent the readers from influencing each other. Each reader should face in opposite the next one, or the readers should be in separate places with identical lighting and temperature. Each child will have an identifying label, which it will present to the reader. The reader will have a worksheet with two columns: the first is to write in the child's number, and the second for the interpretation of that child's palm.

Technique for Assessment of Palmar pallor

The palmar pallor sign will be assessed pursuant to the recommendations of the IMCI clinical course; each child will also be classified according to the course indications.

Sample Size

It is advisable to obtain a basis of at least 100 children classified with *some palmar pallor* and 50 children classified with *severe palmar pallor*, per the reading of the reference reader. The number of children suggested for the *severe palmar pallor* sign can be modified as a function of the prevalence of severe anemia in the area, but it is recommended that there be at least 30 children in this group.

The number of children to be assessed should also be adjusted according to the number of groups across which one wants to analyze the consistency between readings by different observers. For example, if there is a decision to assess this as a function of the child's age, the figures should be obtained for the groups between 2 and 11 months and between ages 1 and 4. Likewise, if one wishes to conduct an assessment with regard to race (white or black, for example), the recommended considerations for the number of children should also be followed for the different groups that match this variable. Other variables for which this recommendation should be taken into account could also be, for example:

- Nutritional status.
- Classification according to the IMCI strategy (for example, very severe disease, malaria, or classifications that require only symptomatic treatment in the home).

Consolidation of the Data

At the bottom of the worksheet used to record his readings, each observer should make a note of his own identity (which can be the name and surname, a previously assigned code, or some similar identification).

Having concluded the readings, the person responsible for processing should assemble all the worksheets and transfer each reader's data to a single worksheet. Table 1 of the Annex 26.A can be used for this; the first column records the number assigned to each child, while subsequent columns are used for the readings by each reader that are to be compared.

If one wishes to break down further the group of assessed children, the appropriate information recorded in Table 1 should be included. For example, if the group of assessed children is broken down by age, race, or sex, this information should be noted alongside the identification of each child (column 1 of the Table), or additional columns inserted prior to registering the results of the Assessment for each observer.

Every result should be crossed out and replaced with a dash if it is considered doubtful for any reason.

Processing and Analysis of the Results Obtained

Having consolidated the data, proceed to prepare tables of agreements and conflicts between each reader and the reference reader, and between readers, taken in pairs; See Table 2 (Annex 26.B). The most important thing is to compare each reader with the reference reader. The boxes to be marked for compatible readings between the readers are in Table 2. The alternatives corresponding to the readings of the reference reader will be always placed in the heading of the table columns; the readings of the other readers will be recorded in the rows, per the classification of the boxes on the table's left.

Having made up each table, proceed to calculate the consistencies between each reader and the reference; to do this, total the numbers in the boxes for the consistencies (marked boxes) and divide the result by the total of valid readings conducted by the two people being compared, which is in the general total box. Multiply the product of the division by 100 and compare this result with the percentage of consistencies achieved by the reference reader vis-à-vis the results of the laboratory hemoglobin measurement.

To Calculate the Indicators

The information from Table 2 of Annex 26.B can be used to calculate the percentage of overall consistency and the percentage of consistency between positives for each observer and the reference reader.

Table 26.1 includes some examples of indicators that can be calculated, and the formula for the calculation.

Table 26.1

INDICADOR	NUMERADOR	DENOMINADOR
Ratio of overall consistency between an observer and the reference reader	Total number of children classified in the same way by the observer and the reference reader.	Total number of children classified by the observer and the reference reader.
Ratio of consistency between an observer and the reference reader in positive cases.	Number of children classified in the same way by the observer and the reference reader, excluding those classified as *No Palmar pallor* by both.	Total number of children classified by the observer and the reference reader, excluding those classified as *No Palmar pallor* by both.

The indicators are included only by way of example; other ratios can also be calculated based on the data of Table 2 of Annex 26.B. In all Cases, the indicators can be calculated for every group into which the study population has been divided, as a function of age, sex, race, etc.

ANNEX 26.A
ASSESSMENT OF THE PALMAR PALLOR SIGN BY DIFFERENT OBSERVERS IN THE PRESENCE OF A REFERENCE READER

TABLE 1: RESULTS OF THE OBSERVATIONS

CHILD	OBSERVER										REFERENCE READER
	1	2	3	4	5	6	7	8	9	10	

Observations:

ANNEX 26.B
STUDY ON VARIATIONS IN THE CLASSIFICATION OF PALMAR PALLOR IN CHILDREN AGED 2 MONTHS TO 5 YEARS

TABLE 2: TABULATION OF THE DATA

Observer: _____ Period: _____

CLASSIFICATION BY THE OBSERVER	CLASSIFICATION BY THE REFERENCE READER			
	SEVERE PALMAR PALLOR	SOME PALMAR PALLOR	NO PALMAR PALLOR	TOTAL
SEVERE PALMAR PALLOR				
SOME PALMAR PALLOR				
NO PALMAR PALLOR				
TOTAL				GENERAL TOTAL

Observations:

Instructions to Fill Out Table 2 of Annex 26.B:

Table 2 of Annex 26.B may be used to systematize the full information corresponding to every observer; also, a table may be used for every group into which it is planned to divide the study population. For example, if what is being studied is the degree of consistency in the classification of palmar pallor in children of different age groups by each observer, a Table should be used for each age group, and for each observer. If the study population is broken down into other variables (sex, race, time of the year, etc.) there should be as many Tables as there are groups set up for each observer.

Proceed to fill out the Table as follows:

1. Fill out the top part of the table with the observer's identification and any other variable being used for the study. If breaking down the group of assessed children, draw up as many iterations of Table 2 for a single observer, as there are groups defined. In such cases, select the table that applies when the results obtained for each child by the observer are recorded.

2. Take Table 1 of Annex 26.A and identify the appropriate column for the observer whose results are being analyzed.

3. Note the result of the classification obtained by the observer for the first child and select the appropriate row of Table 2 depending on whether it is *Severe Palmar pallor*,Some *Palmar pallor* or *No Palmar pallor.* Confirm the variables selected in order to subdivide the group (age, sex, race, etc.) and select the Table 2 that is appropriate for the observer.

4. Observe the result of the classification obtained by the reference reader for the same child and select the appropriate column of Table 2.

5. Find the intersection of the row and the column selected and mark (|) the box selected.

6. Proceed likewise with all children assessed by the observer for Table 2.

7. Having completed the review of all registries for children assessed by the selected observer, add the number of marks (|) in each box of the table and record the resulting sum in each.

8. Then add up the appropriate boxes to get the total.

PROTOCOL 27

OVERLAP OF MALARIA AND PNEUMONIA CLASSIFICATION IN CHILDREN UNDER AGE 5 IN OUTPATIENT CONSULTATIONS

INTRODUCTION

Acute respiratory infections are the leading reason for outpatient consultations by children under age 5 to the health services in the majority of the developing countries: they are responsible from 4 to 6 out of every 10 consultations, and in some health services account for up to 80% of all consultations.

Although the majority of ARI cases are not severe, some can be due to pneumonia, which if not treated in a timely and proper fashion, can get worse and lead to hospitalization or even death in children under 5.

Early detection and timely administration of proper treatment are essential in diminishing the occurrence of severe cases and mortality by pneumonia. Since, however, cases of pneumonia represent only a small proportion of ARI cases who visit the health services, personnel should be trained to differentiate children who probably have pneumonia out of all children who present ARI. To help health workers in this task, the IMCI strategy makes it possible to be adequately effective in distinguishing cases of pneumonia from cases without pneumonia, and has been effective in reducing the number of severe cases of pneumonia (by allowing for timely diagnosis and the adequate treatment), as well as the number of deaths due this cause in children under age 5.

Application of the IMCI strategy in areas of endemic malaria made it evident, however, that the proposed signs for the classification can occur not only in cases of pneumonia but also of malaria. The overlapping of both clinical pictures is extremely important, since it can mislead health workers into an incorrect classification of the child, or to an incomplete classification in the event that both diseases are present simultaneously. This would lead to failure to provide the necessary treatment, with the consequent probability of worsening and even death of the child.

The strategy of Integrated Management of Childhood Illness makes it possible to overcome this problem, by incorporating a systematic assessment both of pneumonia signs and malaria signs, thus increasing the certainty that the health workers will not miss opportunities to diagnose either illness, whether occurring singly or simultaneously in the child visiting the health service.

A study of the degree to which overlapping occurs in children under 5, according to the characteristics of the area in which the IMCI strategy is implemented with regard to the prevalence of malaria and the type of parasite that produces it, is of interest not only to establish proper criteria to prioritize the control of both problems, but also in order to tailor logistical aspects of the implementation of the strategy, such as the provision of drugs for the treatment and organization of the reference networks and case referrals between the health services of the various levels of complexity.

OBJECTIVE

Determine the frequency of overlap in malaria and pneumonia signs and symptoms in children under age 5, as well as the final result of the classification of the cases, on the basis of the criteria contained in the IMCI strategy.

METHODOLOGY

Population to be Studied

The population to be studied should be located in areas where malaria is transmitted. These areas can be classified according to the prevalence of the disease into *areas of high or average prevalence* and *areas of low prevalence.*

The study will focus on children under 5 who live in areas where cases of the disease have been observed in this age group. Children admitted to the study should present some of the following signs or symptoms:

- Cough or difficult breathing with increased breath frequency (60 per minute or more if the child is less than 2 months old; 50 per minute or more if the child is between 2 and 12 months old; 40 per minute or more if the child is between 1 to 4 years old) or with chest indrawing; or

- Fever.

Per the IMCI strategy, children with these signs receive one of the following classifications:

- Pneumonia (due to fast breathing) or Severe Pneumonia (if there is chest indrawing).
- Malaria (due to fever in areas with risk of malaria)
- Both (if the above signs are combined)

Each of these groups can be stratified by age. To do this, use the age groups proposed in the IMCI strategy: children under 2 months, from 2 to 11 months, and from 1 to 4 years old.

If facilities are available for the thick blood film exam, the cases classified as malaria can also be classified with regard to the type of parasite found: *Plasmodium falciparum, Plasmodium malaria, or Plasmodium vivax.* In this case, a study of the overlap of malaria and pneumonia can also be conducted with regard to the type of parasite that produces malaria.

Criteria for Selection of the Health Services.

The health services that participate in the study should have personnel that have been trained in the application of the IMCI strategy.

If there is a decision to confirm the classifications reached by the health workers applying the IMCI strategy (or the type of parasite giving rise to the diagnosis of malaria in the child), the services selected should have access to:

- Diagnostic confirmation of malaria, through the thick blood film exam, which will make it possible to identify the type of parasite that causes the disease.
- Diagnostic confirmation of pneumonia, through chest x-rays.

The number of health services to be incorporated into the study will depend on the number of children who visit them, so as to assemble a sufficient number of cases, as described below.

Sample Size

The steps for calculating the sample size are described in the section of Part II, Module of Support in Statistical Methodology, on estimate studies. If there is a decision to determine the proportion of cases for each classification in each age group, care should be taken to ensure that the total number of children in each age group meet the requirements of the sample size.

If the study is comprehensive, it is advisable to take into account the characteristics of the population to be studied. This should reflect the relative proportions of each age group. The number of children in each age group of the IMCI strategy should be included in a ratio that is equal to that prevailing in the population that uses the health services under study. This fact should be made explicit in the presentation of the results.

Data Registry and Processing

The results can be recorded using the Recording Form for Care of the Child used in the IMCI clinical course for assessment, classification, and treatment; this has the indications presented by the child, and the classification of its clinical picture. If the study includes the confirmation of the diagnoses through the thick blood film exam and chest x-rays, there should be a decision on what mechanisms should be used to complement the assessment and classification data from these tests, pursuant to the IMCI strategy. Use of Table of Annex 27.A is proposed for systematizing the information.

To Calculate the Indicators

The information from the Table can be used to calculate many indicators on the frequency of the different classifications in children with fever and with pneumonia.

If confirmation tests on the diagnoses of malaria and pneumonia are conducted, two criteria can be adopted for processing and analyzing the information:

- In the columns corresponding to each of these diagnoses include only cases that were confirmed by laboratory or chest x-rays.

- Break down each row or column as a function of the diagnostic confirmation. In case of malaria, rows can be broken down according to the type of parasite found, including the option of a negative finding, which would indicate the lack of a diagnostic confirmation.

In such cases, the proposed indicators can be complemented and expanded to include others referring to the consistency between the classification derived from signs and symptoms pursuant to the IMCI strategy vis-a-vis the laboratory or radiological findings.

Table 27.1 shows some examples of indicators that can be calculated, and the formula for the calculation. The last two indicators can be calculated only if the study incorporated the laboratory diagnostic or radiological confirmation (for malaria or pneumonia respectively).

The indicators are included only by way of example. Other relationships can also be calculated, by using the data in the Table of Annex 27.A. In all Cases, the indicators can be calculated for every age group.

Table 27.1

INDICATOR	NUMERATOR	DENOMINATOR
Proportion of children classified as pneumonia out of all children classified as malaria	Total number of children classified as malaria and also as pneumonia	Total number of children classified as malaria
Proportion of children classified as malaria out of all children classified as pneumonia	Total number of children classified as malaria and also as pneumonia	Total number of children classified as pneumonia
Proportion of children classified as very severe febrile disease out of all children classified as pneumonia	Total number of children classified as pneumonia and also as very severe febrile disease	Total number of children classified as pneumonia
Proportion of children classified as malaria with confirmation by thick blood film out of all children with fever	Number of children classified as malaria with confirmation by thick blood film exam out of all children with fever	Total number of children with fever
Proportion of children classified as pneumonia with confirmation by chest x-ray out of all children with fever	Number of children classified as pneumonia with this chest x-ray diagnosis out of all children with fever	Total number of children with fever
Number of children classified at the same time as malaria by examination of thick blood film and as pneumonia by chest x-ray out of all children with fever	Number of children classified at the same time as malaria by thick blood film exam and as pneumonia using chest x-rays	Total number of children with fever

ANNEX 27.A
STUDY OF OVERLAP OF MALARIA AND PNEUMONIA IN CHILDREN UNDER 5

TABLE FOR CONSOLIDATION OF THE INFORMATION

Service: _____ Period: _____

	TOTAL	CHILDREN UNDER 2 MONTHS		2 TO 12 MONTHS		1 TO 4 YEARS	
		WITH PNEUMONIA	WITHOUT PNEUMONIA	WITH PNEUMONIA	WITHOUT PNEUMONIA	WITH PNEUMONIA	WITHOUT PNEUMONIA
TOTAL							
VERY SEVERE FEBRILE DISEASE							
MALARIA							
FEVER BY MALARIA UNLIKELY							

Observations:

Instructions for Filling Out the Table for Consolidation of the Information:

1. Complete the top part of the Table indicating the health services and the period pertaining to the information (week, month, months, and year).

2. Review the assessment record for the period and select those in which the child had some of the following classifications:

    - Severe Pneumonia
    - Pneumonia
    - Very Severe Febrile Disease
    - Malaria
    - Fever by Malaria Unlikely.

3. Start with the first registry selected that meets the above conditions and proceed as follows:

4. Select the row that corresponds to the registry according to the classification of fever (Very Severe Febrile Disease, Malaria, or Fever by Malaria Unlikely).

5. Observe the age of the child and select the appropriate column.

6. Within the selected column, choose the appropriate breakdown, according to whether the child has pneumonia or not.

7. Mark (|) the box selected.

8. Proceed likewise with all registries.

9. Once the review of all the registries has been completed, the number of marks (|) in each box of the Table should be added up, and the resulting total written down.

10. Then add the boxes in order to obtain the subtotals and totals.

PROTOCOL 28

COMPARISON OF THE EFFECTIVENESS OF ANEMIA TREATMENT IN CHILDREN AGED 2 MONTHS TO 4 YEARS, ADMINISTERING IRON IN DAILY DOSES OR ON ALTERNATE DAYS

INTRODUCTION

A large number of children under 5 in the developing countries suffer from anemia in areas of low and high malaria prevalence. Anemia is most often cause by nutritional iron deficiency, malaria and intestinal parasites. Many of these children are cared for in the health services, but not all of them are assessed to detect the presence or absence of anemia, or treated properly.

Given the importance of anemia as a determining factor in the growth and development of the child, and as a baseline condition for increased frequency and severity of childhood illnesses, the Integrated Management of Childhood Illness strategy includes the systematic assessment of indicators of anemia, and components for the classification and treatment of the child.

When the child is classified as *anemia* (non-severe), equivalent to a hemoglobin concentration (Hgb) from 5 to 11 g/dL, the treatment indication recommended in the IMCI strategy consists of daily administration of a dose of iron in the form of capsule or syrup, over 2 months, with follow-ups every 15 days. If the child does not recover after this treatment, it is referred to a hospital for a more specialized assessment.

In light of the difficulties in getting the parents to follow through with this treatment, some alternative modalities have been proposed in order to reduce the number of doses that have to be administered.

OBJECTIVE

Determine the effectiveness of the treatment of anemia (non-severe), characterized by a Hgb from 5 to 11 g/dL, by administering iron on alternate days over 2 months, by contrast to daily administration of this drug over the same period.

METHODOLOGY

Characteristics of the Population to be enrolled in the study and Procedures to be Utilized

The population to be studied will be of children aged 2 months to 4 years with a Hgb from 5 to 11 g/dL, with or without some *palmar pallor* pursuant to the IMCI strategy.

Children to include in the study should, at the time of being incorporated, be classified as having *anemia* (non-severe), that is, presence of *some palmar pallor sign,* and no other concomitant disease.

Children to be enrolled in the study will also have to meet the requirement of ensuring that the administration of iron will be done as indicated (daily or on alternate days). For this, it is suggested, for example, to use children who attend a day-care center or some other place where the administration of iron as prescribed can be directly supervised.

Children will receive a dose of albendazole prior to initiating the anemia treatment, in order to rule out the presence of parasites that might skew the results of the anemia treatment, as well as antimalarial treatment if in an area of endemic malaria.

The population admitted to the study should be divided into two groups. One group will receive an iron dose of 4 mg/kg/day every day during 2 months; while the other group will receive same iron dose but on alternate days, also during 2 months.

The children making up each group should have similar characteristics with regard to age, sex, and nutritional status, to prevent these variables from influencing the results.

All children included in the study should be followed up once a week through the full assessment provided in the IMCI strategy. The control should be conducted immediately in the event of the appearance of some sign of disease. The classification of the child in each of these assessments will be noted in a special registry for each child. If, in a follow-up, a child is classified as having *severe anemia* (presence of the *severe palmar pallor* sign), the child will be immediately referred to a hospital and withdrawn from the study.

In all cases, children should receive the proper treatments indicated by the assessment and classification of the IMCI strategy in each follow-up. Participation of the child in the study should not prevent the administration of any required treatment.

All classifications and treatments that the child receives will be registered in its record, for as long as the child remains in the study.

In addition to regular follow-ups, a new determination of the Hgb will be conducted at the end of the first month of administration of iron and at the conclusion of the second month (the end of the treatment). The first of these determinations will be conducted to certify that the child's anemia has not worsened (especially in children who receive the treatment on alternate days); the second, to assess the effectiveness of the treatment.

If after the first month of treatment it is observed that the Hgb values have been standardized in children who received a daily dose of this mineral, while remaining stable in children who receive the treatment on alternate days, the study will end and children in the second group will go to the daily treatment for a period of 1 month.

Size of the Population to be enrolled in the study

The steps to calculate the study sample size are described in the section of Part II, Module of Support in Statistical Methodology, on studies for comparison of samples.

The estimated number of the sample of children should be adjusted with regard to the groups into which they are divided as a function of age (from 2 to 11 months and from 1 to 4 years, for example) and sex.

Record and Consolidation of the Data

It is important to have a record for each child in the study, which should have the following information:

- Hgb at the beginning of the study.
- Classification the child received from the assessment per the IMCI strategy.
- Taking of the drug (daily or on alternate days).
- Results of the classification of the child in each weekly assessment, as well as treatments indicated by the classification.
- Results of the Hgb determinations one month after having initiated the treatment and at the end of 2 months of treatment.

All this information can be recorded on the Recording Form for Care of Children Aged 2 Months to 4 Years of the IMCI strategy, or a similar format.

Having concluded the study, the record of each child should be assessed to select those that will be included in order to obtain and analyze the findings. What is most advisable is to include only those children who remained comparable throughout the entire study. It is especially important that there not have been any episodes of disease, or, otherwise, that any episodes that might have occurred be similar. This will avoid the possibility that a lack of effectiveness in the treatment of the group that received iron on alternate days was due to diseases that did not occur in the group of children who received the daily dose treatment.

Having defined all children who will be included in the study, the results will be processed by calculating:

➢ Percentage of children who received daily treatment of iron in which the Hgb increased to 12 g/dL or more.

➢ Percentage of children who received treatment with iron on alternate days in which the Hgb increased to 12 g/dL or more.

The percentages thus obtained will be subjected to statistical significance tests in order to determine whether differences between them are significant (please see the Support Module in Statistical Methodology in Part II).

The Table for Consolidation of the Information of Annex 28.A is included as model on how to consolidate the information and calculate the effectiveness of the treatment of children included in each regimen.

ANNEX 28.A
EFFECTIVENESS OF ANEMIA TREATMENT IN CHILDREN AGED 2 MONTHS TO 4 YEARS, ADMINISTERING IRON IN DAILY DOSES OR ON ALTERNATE DAYS

TABLE FOR CONSOLIDATION OF THE INFORMATION

Place: _____ Period: _____

	NUMBER OF TREATED CHILDREN	NUMBER OF CURED CHILDREN	NUMBER OF UNCURED CHILDREN	PERCENT CURED
TOTAL				
DAILY TREATMENT				
TREATMENT ON ALTERNATE DAYS				

Observations:

Instructions for Filling Out the Table for Consolidation of the Information:

1. Complete the identification data for the place and period of the study.

2. Include any other data identifying the group being studied, for example, age, sex, race; or any other variable considered to be significant, and that has been used to break down the study population.

3. Select the registry of the first child and select the appropriate Table, pursuant to the variables used to separate the various subgroups (age, sex, etc.).

4. Observe the treatment regimen the child received: daily or on alternate days and select the row of the appropriate table.

5. Observe the anemia classification of the child at the end of the treatment (mean corpuscular hemoglobin concentration). Classify the child as cured, if the MCHg is 12 gr/dl or more and mark (|) the appropriate box at the intersection of the row referring to the type of treatment administered and the **Number of Cured Children** column**.** Classify the child as not cured if the MCHg is less than 12 g/dl; in this case mark (|) the box corresponding to the intersection of the row referring to the type of treatment administered and the **Number of Uncured Children** column**.**

6. Proceed likewise with the registry for the next child, until completing the review and consolidating all registries of the study.

7. Having finished, add all marks (|) made in each box and write the resulting sum in the box. Then add the numbers of the boxes of each row and record the result in the box of that row pertaining to the **Number of Children Treated** column**.** Carry out the same procedure adding the boxes of each column and noting the result in the box for the **Total** row.

8. Then calculate the percentage of cured children by dividing the number in the box for the **Number of Children Cured** column by the total number of children in each row who received the treatment pertaining to that row and multiplying by 100. Note the result in the box of each row in the appropriate **Percent Cured** column**.**

9. Calculate the statistical significance tests to confirm whether the differences in the percentages are significant. See the Module of Support in Statistical Methodology of Part II for information on how to conduct the significance tests.

PROTOCOL 29

PROGRESS OF MALNOURISHED CHILDREN UNDER 5 YEARS SEEN IN THE HEALTH SERVICES

INTRODUCTION

Malnutrition is one of the risk factors of greatest importance to the health of the child, since, apart from its impact on growth and development, it is associated with increased incidence, severity, and duration of episodes of disease. There are several causes of malnutrition. One is protein energy malnutrition and it develops when the child is not getting enough energy or protein from his/her food to meet the nutritional needs. A child whose diet lacks recommended amounts of essential vitamins and minerals can develop malnutrition.

Inadequate child feeding practices start at birth. Many children are not breastfed during the first months of life, even though this practice is recommended and is adequate for the child's food requirements. Other children may receive breast milk, but in insufficient quantity and with inadequate frequency. Lack of breastfeeding or poor breastfeeding practices are one of the leading causes of child malnutrition; this furthermore affects the child's disease response capacity, since it is not receiving protective and immune factors from the breast milk that will increase its resistance to disease. The use of artificial milk introduces additional risk factors for the child since they are not always prepared under adequate conditions of hygiene. Thus, apart from affecting nutrition, failure to breastfeed, or doing so inadequately, along with the use of milk substitutes, helps increase the risk of disease for the child and undermines its nutritional status.

The introduction of weaning food at 4 to 6 months is not always done properly. In some cases, nursing is drastically interrupted, rather than being continued up to age 2. The food the child receives during weaning is sometimes prepared under poor sanitary conditions, helping increase the risk of disease (diarrhea) and, therefore, malnutrition. Inadequate feeding practices continue as the child grows, thus worsening the nutritional status of the child.

The causes for inadequate child feeding are basically associated with cultural and social factors determined by the eating habits of the family, as well as the family's access to food that includes all the nutritional requirements of the child.

The interventions to monitor child malnutrition should take into account both types of causes.

In some regions, for example, the availability of food necessary for feeding the child is not a problem, or mechanisms that allow families to obtain such food can be designed. Nevertheless, children's eating habits will be a determinant of a given number of malnourished children. The recovery of malnourished children in such situations is more likely to be determined by changes in habits of procurement, purchase, and use of food than by supplying and supplementing the family's food. Among these situations, special mention should be made of children with malnutrition who are not receiving breast milk as part of their feeding.

In other regions, on the other hand, even though eating habits may play a significant role, many families lack access to the necessary food, so that external supplementation of food will be necessary.

It is thus extremely important to characterize the situation in each area of intervention in order to design sound strategies to modify the nutritional status of children.

The IMCI strategy includes a strong educational component geared to improving the family's child feeding knowledge and practices, including recommendations to promote exclusive breastfeeding up to 4 to 6 months and complementary breastfeeding up to age 2. It is expected that application of the IMCI strategy will help improve the nutritional status of the child. However, it is unknown what the impact will be on the nutritional status of children cared for in health services, since this will vary depending on the chief causes that determine their nutritional status.

OBJECTIVE

Determine the impact of application of the IMCI strategy on the nutritional status of children who visit the health service.

METHODOLOGY

Population selected for the study

The population to be studied will be children under 5 who visit the health services for care and who are classified as malnourished based on application of the criteria for assessment and classification of the IMCI strategy.

This population group can be broken down with regard to the degree of malnutrition, age, or other variables that are of interest. For example, a study can be conducted on improvements in the nutritional status of children, who are breastfed and children who are not, or with regard to other social, economic, or cultural variables of the family.

Improvements in the nutritional status of children can also be studied with regard to different ways to implement the educational component of feeding. For example, the study can incorporate sessions with the mothers of children with some degree of malnutrition (such as workshops to practice the preparation of different food), further occasions to strengthen the educational contents of visits to the health service, visits to the mother's home to support the resolution of problems, etc.

In order to establish the degree to which improvements in the nutritional status of children can be attributed to application of the IMCI strategy, it should be studied before and after application of the strategy.

It should be taken into account that the application of the IMCI strategy implies that:

- The health services personnel have been trained in the theoretical and practical implementation of the strategy, preferably having attended an IMCI clinical course.

- The health services where the trained staff works have the necessary supplies to implement the recommendations for the assessment and treatment of the children.

- The health workers are able to analyze problems, difficulties, and questions concerning the correct implementation of the IMCI strategy, through follow-up visits after training, and periodic supervision, both directly and indirectly.

- The Community attending the health service facility has access to educational activities, both on a personal level during, before, or after consultation, and in groups through talks, meetings, and similar activities.

Although the application of the IMCI strategy includes diagnosis and treatment components, the components geared to improving the education of the families with respect to the care of the child in the home will be the ones with the greatest influence on nutritional status. Consequently, it should be ensured that the health workers devote the necessary time and use the materials and methodologies to comply with the IMCI strategy's recommendations on educating caregivers with regard to feeding the child. The techniques and methodologies that the health workers will use for the education effort should be defined with due regard to the objectives of the study, and to whether they will include the assessment of different techniques, materials, or methodologies.

Nutritional Assessment

The assessment to be conducted includes the following aspects, which should be verified during each of the child's visits:

- Nutritional status of the child, per guidelines included in the generic IMCI strategy, or the version adapted to local conditions.

- Dietary practices, including the child's food (breast milk, other food and beverages, etc.), how it receives its food, and feeding stimuli.

The nutritional assessment will be done using the weight-for-age curve. If an assessment of the height-for-age curve is also included, the size should also be measured, and if the cephalic perimeter is also included, this measurement should be conducted during the assessment.

The dietary practices should be assessed by talking to the mother, and verifying whether she made the changes suggested to her during her first visit to the health services.

It is advisable to assess the reliability of the mother's information concerning any changes made or not made in the dietary practices. This can be accomplished through a home visit conducted by another person (not the one serving at the health services). Preferably this person will be experienced at conducting household surveys. The visit should reassess the current eating habits of the family in general and the child specifically.

In order to collect the information Annex 29.A includes a File for Monitoring and Follow-up of Progress in Nutritional Status for each child incorporated in the study. This File should be filled out with the information obtained from each consultation and from the house calls, if these are conducted. The File can be used to directly record the information from the consultation; it can also be filled out using the registry that is ordinarily used in the consultation. Likewise, the File can also be used during the household interview. If the File is being used during the consultation,

there should be an evaluation of whether using the same file in the interview will not skew the information the mother provides, once she sees the very same registry that the health workers used during the consultation.

Technique for Obtaining Information on Eating Habits

The family's child feeding habits should be carefully assessed, in order to let the child's mother or caregiver to express freely how the child is being fed. In doing so, special care should be taken in subsequent consultations; if the mother did not follow through with the recommendations that the health worker provided, she will be self-conscious of the fact that she did not do what was recommended. At all times, any feelings of guilt that might lead the mother to provide unreliable information should be avoided.

This should be taken into account in order to ensure the accuracy of the information collected. Otherwise, it will be impossible for the health workers to support the mother in talking about her problems in carrying out the recommended practices; the child will thus be unable to benefit and improve its nutritional status.

The variables included in the File to assess the family's eating habits with regard to the child are the ones included in the IMCI strategy. Other variables can be included as necessary. All the variables should be assessed in all the consultations, as well as in the house call, if included in the study.

The eating habits should be assessed at the first consultation in order to identify possible problems in the child's feeding and to provide the mother recommendations to resolve them. In subsequent consultations, the assessment of the eating habits should seek to determine if the mother did or did not make the changes suggested, and, if not, possible causes and problems determining her failure to follow the recommendations.

Sample size

The steps to calculate the sample size are described in the section of Part II, Module of Support in Statistical Methodology, on studies to conduct a comparison between the Situation Before and After Implementation of the IMCI strategy.

The calculation of the sample will depend on the characteristics of children who are to be assessed. The size should be adjusted according to the different groups in which one wants to analyze the progress with respect to nutritional status. Characteristics that can influence changes in nutritional status include, for example, diseases that affect the child and their frequency (which will slow down full nutritional recovery), the age of the child (which, if under 4 months old, will make it possible to improve nutritional status with breastfeeding only), or whether other, more diversified, foods are needed, and in greater quantities.

The number of children should be adapted to the groups into which the population under study is to be broken down. For example, there may be a decision to assess the progress of the nutritional status regarding the child's age, or one may wish to conduct an assessment regarding the initial nutritional state (low weight-for-age and very low weight-for-age). All such cases should ensure that the groups have no fewer than 50 members.

Record and Consolidation of the Data

Since the File for Monitoring and Follow-up of the Progress of the Nutritional Status (Annex 29.A) contains a great deal of information, it is advisable to systematize the aspects to be analyzed. Based on the main objective of the study, the following will be considered:

> *Proportion of children with positive progress in their nutritional status, after an adequate period of time (for example 4 to 6 months).*

This can be assessed with regard to two types of nutritional result:

- Children who are eutrophic after the selected period.
- Children who have increased their weight-for-age ratio during the selected period, but are not yet eutrophic.

The assessment of these indicators can be conducted with regard to different groups, such as:

- Children whose family did not receive any external food support.
- Children who were properly fed following the first consultation.
- Children who were properly stimulated following the first consultation.
- Children for whom breastfeeding improved following the first consultation.
- Children whose prescribed treatment was followed if they were sick.

Table 1 and Table 2 of Annex 29.B includes provide a model to consolidate the information recorded in the individual Files for each child.

If one wishes to analyze progress with respect to nutritional status by breaking down the children according to different variables, proceed as explained above, selecting a Table for each subgroup defined as a function of the variable to be studied. For example, a Table can be prepared for children who received external food support for the family vis-à-vis children who did not receive it, or for children whose mother was encouraged to practice breastfeeding vis-à-vis children who did not breastfeed, etc.

To Calculate the Indicators

The information from the Tables of Consolidation of the Information can be used to calculate many different indicators on improvements in the nutritional status of children, which will vary depending on the information included in the Tables.

Each indicator can be assessed for all the children studied, or broken down by nutritional status. At the same time, each of these subgroups can be differentiated as a function of the age of the child, or any other variable used.

Table 29.1 includes some examples of indicators that can be calculated, as well as the formula for the calculation.

In all cases, it should be remembered that the indicators may be calculated for each group into which the population studied as a function of age has been broken down (sex, race, nutritional status, etc.) whenever these variables have been factored into the preparation of Table 1 and the processing of the data of Table 2.

Table 29.1

INDICATOR	NUMERATOR	DENOMINATOR
Proportion of children with low weight or with very low weight-for-age who were classified as eutrophic at the end of the period.	Number of children with low weight or with very low weight-for-age who were classified as eutrophic at the end of the period	Total number of children with low weight-for-age + total number of children with very low weight-for-age at the beginning of the period.
Proportion of children with very low weight-for-age who were classified as low weight-for-age or eutrophic at the end of the period.	Number of children with very low weight-for-age at the beginning of the period who were classified as low weight-for-age or eutrophic at the end of the period.	Total number of children classified as very low weight-for-age at the beginning of the period.
Proportion of children with low weight-for-age at the beginning of the period who were classified as very low weight-for-age at the end of the period.	Number of children with low weight-for-age at the beginning of the period who were classified as very low weight-for-age at the end of the period.	Total number of children with low weight-for-age at the beginning of the period.
Proportion of children who remained classified as low weight-for-age but with a rising trend in their weight-for-age curve.	Number of children classified as low weight-for-age at the beginning and at the end of the period, whose weight-for-age curve was on a rising trend	Total number of children classified as low weight-for-age at the beginning and at the end of the period.

ANEXO 29.A

FICHA DE SEGUIMIENTO Y CONTROL DE LA EVOLUCION DEL ESTADO NUTRICIONAL

Health Services:_____ Surname and name of the child: _____

Surname and name of the mother: _____ Address: _____

	DATE									
General data for nutritional classification										
Age										
Weight										
Size										
Cephalic perimeter										
Nutritional classification										
Progress of nutritional status										
Diseases Present in the Child										
1										
2										
3										
4										
Treatment										
1										
2										
3										
4										
Compliance with prescribed treatment										
1										
2										
3										
4										

	DATE											
Breastfeeding												
Is breastfeeding												
How many times per day												
Also at night												
Adequate breastfeeding												
Other type of food/Number of times per day												
1												
2												
3												
4												
Other type of fluid/Number of times per day												
1												
2												
3												
What food do you give the child/Size of portions												
1												
2												
3												
4												
Does the child get its own portion?												
Adequate diet												
Stimulation for feeding												
Who feeds the child?												
How is the child fed?												
Adequate incentive												
Received food support												
1												
2												
3												
Other observations												

Instructions for Filling out the File on Monitoring and Follow-up of Progress in Nutritional Status

The File on Monitoring and Follow-up of Progress of the Nutritional Status consists of the following parts:

- A top section for data identifying the health services, the child and the mother (or caregiver) and the address (for the house call).
- The main body of the file, recording various aspects of the assessment of the nutritional status and the child's feeding (first column) and the space for the findings of both assessments in each consultation (Columns 2 to 11).

To Fill out the File:

➢ In the top part include all data identifying the service, the child, and its family. Include in the lower part of the File any other information that might be helpful for the identification and that it is not included in the File.

➢ In the top part of the second column record the appropriate date for the consultation (or house call, if conducted). Next, fill out each aspect itemized in the first column, pursuant to the indications below.

General Data for the Nutritional Classification

➢ Record the age of the child in the box for the current consultation. Specify the age in months or in years and months.

➢ Record the weight (grams), size (centimeters), and the cephalic perimeter (in centimeters) of the child in the boxes that correspond to the current consultation.

➢ Record the nutritional classification of the child for the current consultation, based on the IMCI strategy's classification criteria. Mark **EU** (eutrophic), **LW** (low weight-for-age), or **VLW** (very low weight for the age), or any other classification sign adopted.

➢ Record progress in the nutritional status at the current consultation: (↑) if the child is increasing, declining (Ø), or stable (æ) with regard to the nutritional status presented at the previous consultation. Make this decision with regard to the child's placement on the weight-for-age curve in the current consultation and in the previous consultation, not on the basis of the nutritional classification (a child may be increasing its weight-for-age ratio yet remain in the same nutritional classification).

Diseases Present in the Child

- In the boxes of this section record the classification the child might have received concerning diseases present at the time of the consultation, for example, pneumonia, diarrhea with dehydration, acute otitis media, etc. To facilitate the registry, the abbreviations can be systematized for each classification included in the IMCI strategy.

Treatment

- In the boxes of this section record the drugs indicated to the mother for treatment. Include all drugs, and not only those that correspond to the child's classifications. For example, if a parasiticide was prescribed, or vitamin A, etc. To facilitate the registry, standardized abbreviations can be used.

Compliance with the Prescribed Treatment

- This section should not be completed at the first consultation, but based on subsequent consultations, whenever treatment with drugs was prescribed in the prior consultation. In each box for the consultation, record whether the mother is complying with the treatment prescribed at the previous consultation (YES) or if not (NO).

Breastfeeding

- In the box for the current consultation record whether the mother is breastfeeding the child (YES) or not (NO).

- In the box for the current consultation record how many times a day the mother is breastfeeding the child.

- In the box for the current consultation record whether the mother is also breastfeeding the child at night (YES) or if not (NO).

- In the box for the current consultation record whether the mother is practicing proper breastfeeding (YES) or if not (NO). Proper breastfeeding means: that the mother is breastfeeding the child (up to age two, or according to local standards for breastfeeding); if the number of times per day that the child is being breastfed is adequate (at least 8 times a day if the child is less than 6 months old), and if the child is being breastfed at night. This definition may be adjusted to account for local adaptation of this component of the IMCI strategy.

Other Types of Food/Number of Times per Day

- In the box for the current consultation record any additional food the mother may be giving the child and how many time a day it is being given, and whether this is satisfactory per the recommendations of the IMCI strategy. To this end abbreviations such as "A" can be used for adequate and "I" for inadequate, indicating this classification for both variables: type of food and number of times a day (A/A, A/I, I/A, I/I). The definition of adequate or inadequate should be standardized on the basis of the feeding recommendations for every age group that have been adopted in the country.

Other Types of Fluids/Number of Times a Day

- In the box for the current consultation record what fluids the mother is giving child, how many times a day, and whether this is adequate or not, on the basis of the recommendations of the IMCI strategy and its local modifications. The methodology suggested above can be used to record this information.

Food Given to the Child/Size of the portions

- In the box for the current consultation record whether the food that the mother is giving the child and the size of the portions are adequate or not, on the basis of the recommendations of the IMCI strategy and its local modifications. The methodology suggested above can be used to record this information.

- In the box for the current consultation record whether the child receives (YES) or does not receive (NO) its own portion of food.

- In the box for the current consultation record whether the diet is adequate (YES) or not (NO), on the basis of the mother's responses to the above items (from the section on Breastfeeding up to this section).

Stimulation for Feeding

- In the box for the current consultation record who feeds the child. Use standardized abbreviations, for example F (father), G (grandmother), U (uncle), B (brother), etc.

- In the box for the current consultation record whether the way the child is being fed is adequate, on the basis of the recommendations of the IMCI strategy. Take into account whether the child eats alone or not, if the place where it eats is propitious, (for example with the family, with the mother or father, in a relatively calm place, etc.).

- In the box for the current consultation record whether the child is being properly stimulated to eat (YES) or not (NO). Take into account whether someone is helping the child to eat, if an effort is being made for the child to eat, if there is stimulation when the child does not want to eat, etc.

Food Support Received

- In the boxes for the current consultation record whether the child is receiving some type of food support and whether it received it during the period included between the previous and the current consultations. To facilitate the registry, abbreviations can be established for the various types of food assistance that exist in each locale, for example "WMD" (delivery of whole milk), "CDR" (if the child attends a community dining room), etc. With respect to food support, there special attention should be paid to its distinct features. For example, the quantity of whole milk that families receive can vary; it is thus necessary to include this specification. How often a child eats in a community dining room can also vary; it is thus also necessary to include this specification. Establish different codes or abbreviations for the most common situations. Other situations can be clarified in the following section.

Other Observations

- Finally, in the boxes for the current consultation record any other observation that is deemed pertinent, that is characteristic of the place, and has not been included in the file. This section, for example, might include the special recommendations on feeding that are provided to the child's mother during a disease and after recovery (to increase the quantity of food at each meal, and the number of daily meals), and that are not itemized in the main body of the file.

ANNEX 29.B
PROGRESS IN THE NUTRITIONAL STATUS OF CHILDREN UNDER 5

TABLE 1 FOR CONSOLIDATION OF THE INFORMATION

Health Services/Area: _____ Period: _____

Group: _____

INITIAL CLASSIFICATION	FINAL CLASSIFICATION			
	TOTAL	EUTROPHIC	LOW WEIGHT-FOR-AGE	VERY LOW WEIGHT-FOR-AGE
TOTAL				
LOW WEIGHT-FOR-AGE				
VERY LOW WEIGHT-FOR-AGE				

Observations:

PROGRESS IN NUTRITIONAL STATUS OF CHILDREN UNDER 5

TABLE 2 FOR CONSOLIDATION OF THE INFORMATION

Health Services/Area: _____ Period: _____

Group: _____

INITIAL CLASSIFICATION	TOTAL	CLASIFICACION FINAL								
		EUTROPHIC			LOW WEIGHT-FOR-AGE			VERY LOW WEIGHT-FOR-AGE		
		↑	—	↓	↑	—	↓	↑	—	↓
TOTAL										
LOW WEIGHT-FOR-AGE										
VERY LOW WEIGHT-FOR-AGE										

ObservaTions:

Instructions for Filling out Tables 1 and 2:

Table 1 is to analyze the progress of the nutritional status of children in terms of its classification at the beginning and at the end of the assigned period. Table 2 takes into account not only the nutritional classification at the end of the period but also the trend in the child's nutritional status during that period. The instructions that follow may be used to fill out both tables.

1. At the top of the Table fill out the data identifying the area or health services where the work took place, and the period covering the information. Include any other information on the group that will be processed, for example, children from 2 up to 4 or 6 months, from 6 to 11 months and from 1 up to 2 years, or any another breakout. Prepare a Table for each subgroup.

2. Select the first File and confirm the group to which the child belongs, pursuant to the different groups into which it has been decided to break down the population being studied. Select the table for the group to which the child belongs.

3. Observe the nutritional classification of the child at the first consultation and select the appropriate row: Low Weight-for-Age, or Very Low Weight-for-Age.

4. Observe the nutritional classification of the child at the consultation at the end of the period set for the study. Find the consultation closest in time to that moment (either previous or subsequent), ensuring that it does not exceed the time frame determined for the analysis, and so as not to include in the same group children who were assigned at different times following recovery. Based on the final classification, select the column to which the child belongs: Eutrophic, Low Weight-for-Age, or Very Low Weight-for-Age.

5. If using Table 2, it should also be noted whether the nutritional trend of the child has been rising, declining, or stable. The general trend for the period can be chosen, along with the trend between the last and the previous consultations.

6. Mark (|) the intersection of the row and the column selected. If using Table 2, remember to find the column corresponding to the situation of the child, taking into account its nutritional status and the trend.

7. Repeat the procedure for the next File until completing all the files.

8. Add the marks in the different boxes of each row and record the resulting number in the box for the **Total** column. Repeat this procedure for the marks in the boxes of each column and record the result in the **Total** row.

9. Confirm that the totals for the boxes of columns 3 to 5 of the **Total** row and the totals for the boxes of rows 3 and 4 of the **Total** column are the same. Record this number in the intersection of the **Total** row and the **Total** column.

PART VII

RESEARCH ON RISK FACTORS

PROTOCOL 30

FACTORS LINKED TO THE NONCOMPLIANCE OF PARENTS WITH HOSPITAL REFERRAL

INTRODUCTION

Parents and the family play a pivotal role in the health of children; not only are they responsible for the care of children in the home, but also for determining when a child is sick and what to do about it. Since the family decides whether a child's illness warrants a visit to the health service, family attitudes also determine whether or not health workers' instructions regarding the treatment and care of the child are followed.

The ability of families to recognize the signs of childhood illness determines how early on they take children in for consultation to the health service. Likewise, this fact also has a significant impact on the rate of occurrence of serious disease (associated with delays in treatment), and on household deaths attributable to the lack of timely treatment.

Family attitudes regarding treatment recommendations made by health workers during the visit are essential with respect to the progression of the child's illness and, consequently, the number of cured cases and complications.

In either case, however, parental attitudes are influenced by numerous factors associated with the organization and the characteristics of care at health services. In some instances, no health services are located nearby where people can consult when children are sick, or there is a lack of convenient and accessibly priced transportation. In others, people do not visit health services in the early stages of disease due to problems they encountered in previous consultations, such as long waits, poor treatment by health workers, and cost.

The lack of family compliance with treatment recommendations made by health workers during the consultation may not only be related to health workers' knowledge, attitudes, and practices, but also to the contents of these instructions and, primarily, the manner in which treatment instructions are given. Oftentimes, instructions for treatment are not adequately communicated to families because personnel use overly technical language to explain treatment, parents are not given a sufficient opportunity to ask questions, or parents are not provided with the information they need to solve potential difficulties in the course of carrying out treatment instructions.

Although it always is important for the family to follow through with treatment instructions in order to ensure that the child's condition improves, when instructions include hospital referral, a lack of compliance can result in the rapid deterioration of health and threaten the life of the child. The Integrated Management of Childhood Illness strategy includes general instructions for treating children's clinical manifestations and techniques for improving communication between health workers and parents. In the event that a hospital referral becomes necessary, the IMCI strategy includes a set of special recommendations designed to ensure that parents bring the child to a hospital. Because these are general instructions and recommendations, parental compliance may not always be possible, as other factors come into play that are unique to areas where the strategy is being implemented.

An analysis of the possible reasons why parents fail to follow through on health workers' instructions for hospital referral will facilitate the identification of additional factors that need to be addressed by health workers. Efforts in this regard should help to improve parental compliance with hospital referral.

OBJECTIVE

The objective of this study is to determine the reasons why families fail to comply with health worker instructions for hospital referral.

METHODOLOGY

One or more areas will be selected where the population has access to at least one health service. Accordingly, the families of children referred to a hospital by health workers in these areas will form the basis of the study.

Steps for calculating the size of the study sample are described in Part II, Support Module for Statistical Methodology.

Once the study population had been determined, children who received care at the health services during a given period and were referred to a hospital by health workers will be identified. Accordingly, the selected health service(s) must have:

- A daily patient log to facilitate identification of cases treated during the study period;

- Either included in the daily patient log or in a separate registry—i.e. clinical history or outpatient care file—information regarding the consultation, including the instruction for hospital referral, and preferably, if the referral was for hospitalization, any complementary diagnostic studies or additional treatments. In the event children are referred to more than one hospital in the survey area, the record/registry should clearly state the hospital to which a child was referred, since the reasons for lack of compliance can vary according to the health service to which the mother was referred;

- Either included in the daily patient log information regarding clinical history, or the child's file, the date of the consultation and address of the child.

The data described above must be compiled into a list of children referred to hospitals. The list will then be used to verify with hospitals whether or not the parents brought in these children. Annex 30.A includes a model of the form used for this task, which also includes space to record data from the hospitals where children were referred.

Each entry in the lists of referred children, compiled by the selected health services for the study period, will be checked against records at each hospital where children were referred. This is needed to verify whether or not children received care at these institutions pursuant to the referral on record at the first level health services. To this end, hospitals must have a patient intake registry in order to identify cases where children were not brought in by their parents. This registry should

contain personal data on the child (full name, address, etc.), the date the child was brought to the hospital, and, whenever possible, if the child was referred by another health service.

Regardless of the reason for referral, it is important that hospital intake records indicate the diagnosis made by hospital health workers. In the case of children referred by outpatient health services that are admitted to the hospital for other services (i.e. emergency room care, pediatric services, external examination, or diagnostic services such as laboratory or radiology services, etc), this fact must be corroborated in all registries.

For the purposes of this study, relevant hospital care is that care given in response to the referral of first-level health services. This does not include care given subsequent to referral in cases where families seek care for a child whose health has since further deteriorated developed another illness. The primary objective is to evaluate the lack of compliance with referrals made by first-level health services. Accordingly, evaluate all cases where families decided not to bring in children when instructed by first level health workers—regardless of whether or not the child's health subsequently took a turn for the worse or developed to another health problem.

The list of children referred by health services will be cross-referenced with the corresponding hospital records. Household survey forms will be prepared and used to collect information on children referred by health workers whose entries on the list cannot be corroborated by hospital records. These will be used in conjunction with home visits to record information as to why the family decided not to bring the child to a hospital pursuant to health worker instructions.

Annex 30 B contains a sample household survey form that can be used for this task. This form should be used in home visits to all children referred to a hospital by health services, but whose parents or caregiver(s) did not follow through with the referral.

DATA PROCESSING

Once all surveys are complete, the data obtained are to be analyzed. As a first step in this process, it is helpful to determine how many of the total number of children referred to a hospital by outpatient health services actually appear in the records of the hospital or hospitals of reference. This activity can be facilitated using the form for recording hospital-referred cases as follows:

- Count the total number of children referred to hospitals by outpatient health services;
- Of the total number of children, count those for whom hospital records corroborate hospital care;
- Of the total number of children referred to a hospital by outpatient health services, calculate the percentage of those for whom hospital records corroborate care.

In addition to the latter, it is also helpful to calculate the percentage of children referred for hospitalization or study (consultation with specialists, for radiology or laboratory services) because it is thought that parents are more likely to take children to the hospital when the referral is to treat illness, rather than for study or internal consultation.

Subsequently, household survey forms should be used:

- To determine the percentage of children for which no hospital record can be found, but whose parents claim to have followed through with the referral. This task is very important as it helps identify problems in hospital records and/or those encountered in the search for information in hospitals. In the event that among children who were initially classified as "not taken to the hospital by parents" include significant numbers of children who actually were taken by parents, but did not appear in hospital records, then hospital record keeping systems should be improved;

- To evaluate, in general terms, the reasons given by parents or other caregivers leading to their noncompliance with health workers' recommendations for hospital referral;

- To classify these reasons into a condensed group of categories in order to determine which factors are most often cited as justification for noncompliance with hospital referral.

It is further recommended that such evaluations be made for all children referred, as well as for the different reasons for referral, since the reasons cited by parents who did not follow through with health worker instructions for hospital referral may be different depending on whether the referral was for complementary/diagnostic studies or hospitalization of the child for treatment.

The data summary table in Annex 30.C lists factors that can be useful for developing small groups of categories for analysis. Nevertheless, a descriptive analysis of the reasons cited by families for not taking a child to the hospital it is always recommended as a first step. Subsequently, this analysis should be used as a basis for modifying and expanding the aforementioned categories. It is recommended that additional tables be prepared for each reason cited for referral by first-level health workers.

Additional Considerations

Families may cite numerous reasons for not following through with a recommendation for hospital referral. As a starting point it is helpful to compile an exhaustive list of these reasons, taking care not to group them unless they are equivalent. Particular categories can be defined during a second review of the list, for example, economic or family reasons, or the distance to a hospital, etc.

In addition to such categories, inclusion of a category for assessing the family's perception of the severity of a child's illness is also recommended. This is important since, in most cases, a family's decision as to whether or not to take a child to the hospital is based on its assessment of the severity of the episode of disease. This assessment forms the basis for deciding whether or not the child's condition merits facing the necessary obstacles to comply with instructions for hospital referral.

A family's perception of the severity of an episode of disease (or lack thereof) for which a health worker has recommended hospital referral is to be included as a category in the table. However, it should be borne in mind that the definition of this category requires a variety of data. This data should include the health worker's classification of the child's signs and symptoms, reason for hospital referral, any alternative treatment the family followed, and progress with respect to clinical condition, since all these elements can provide both objective and subjective information regarding the degree to which the child was at risk.

Table 30.1 includes examples of indicators that can be developed using the data collected.

TABLE 30.1

INDICATOR	NUMERATOR	DENOMINATOR
Percentage of children not taken in for hospitalization because parents did not consider the episode of disease to be serious	Number of children not taken in for hospitalization because parents did not consider the episode of disease to be serious	Number of children referred for hospitalization by health workers **minus** the number referred for hospitalization by health workers for which no information is available on parents' perception of the severity of the episode of disease
Percentage of children not taken in for hospitalization because parents considered the costs of transportation to the hospital and/or hospital care to be too high	Number of children not taken in for hospitalization because parents considered the costs of transportation to the hospital and/or hospital care to be too high	Number of children referred for hospitalization by health workers **minus** the number referred for hospitalization by health workers for which no information is available on parents' opinion concerning cost
Percentage of children not taken to the hospital for consultation with a specialist because parents encountered family difficulties following through with the referral	Number of children not taken to the hospital for consultation with a specialist because parents encountered family difficulties following through with the referral	Number of children referred for consultation with a specialist **minus** the number referred for consultation with a specialist for which no information is available on possible family difficulties in following through with the referral

ANNEX 30.A
FORM FOR RECORDING AND MONITORING HOSPITAL REFERRALS

Health Services/Region: _____

CARE AT OUTPATIENT HEALTH SERVICES						HOSPITAL CARE			
DATE	SURNAME AND NAMES	AGE	ADDRESS	DIAGNOSIS	REASON FOR REFERRAL	DATE	DIAGNOSIS	TREATMENT	PROGRESS

Observations:

ANEXO 30.B
FICHA DE ENTREVISTA A LA FAMILIA EN EL DOMICILIO

Child Identification Data:	
Child's full name:	
Age: [____] Sex: [____] Date of birth: ____/____/____	
Mother's full name:	
Child's address:	
Date of interview: _____/_____/_____ Date of initial visit: _____/_____/_____	
Health service of the visit:	
Diagnosis:	Treatment:
Family Composition (those living at the same address):	
Father Yes [__] No [__] Grandmother Yes [__] No [__]	Siblings Yes [__] No [__]
Mother Yes [__] No [__] Grandfather Yes [__] No [__]	- Older No [__]
Who cares for the child: [_____]	- Older No [__]
Mother's education: Primary [__] Yrs. [__] Secondary [__] Yrs. [__] Higher ed. [__]	
Father's education: Primary [__] Yrs. [__] Secondary [__] Yrs. [__] Higher ed. [__]	
Caregiver's education Primary [__] Yrs. [__] Secondary [__] Yrs. [__] Higher ed. [__]	
Characteristics of Housing	
Urban [__] Rural [__] Number of rooms: [__] Indoor water service: Yes [__] No [__]	
Bathroom: Yes [__] No [__] Latrine: Yes [__] No [__] Eating area: Yes [__] No [__]	
Number of people who sleep per room: [__] Number of people who sleep with the child: [__]	
Prenatal Care	
Prenatal care given? Yes [__] No [__] Health Center [__] Hospital [__]	
Other:	
Has prenatal care card? Yes [__] No [__]	
Early monitoring? Yes [__] No [__] Periodic monitoring? Yes [_] No [_]	
Child Delivery and Feeding at Birth	
Where was the child born? Hospital [__] Home [__] Other: _____	
Has the child been with you since birth? Yes [__] No [__] Did you breast-feed the child? Yes [__] No [__]	
When did you first begin breast-feeding the child?	
Was the child given something before breast-feeding? Yes [__] No [__]	
If yes, what was the child given?	
In addition to breast milk, did you give the child anything else after leaving the Hospital? Yes [__] No [__]	
If yes, what was the child given?	
On Follow-up Care for the Child at the Health Service	

When was the first time you took the child in for a follow-up visit?

To whom did you take the child? Health services [__] Shaman [__] Other:

When you take the child to a health service, which one do you go to (name or address of health service)?

Does the child have a vaccination card? Yes [__] No [__] Are vaccinations up to date? Yes [__] No [__]

Does the child have a development-monitoring card? Yes [__] No [__]

Is the card up to date? Yes [__] No [__]

Family and Child Care

Work Father Yes [__] No [__] Outside the home? Yes [__] No [__] Hours [__]
Mother Yes [__] No [__] Outside the home? Yes [__] No [__] Hours [__]

Do you have enough time to look after the child? Yes [__] No [__]

If no, list reasons

	Who is at home?	Who takes care of the child?	Who feeds the child?
Morning			
Midday			
Afternoon			
Night			

On Care of the Child at the Health Service

When was the child taken in for a visit?

Who took to the child to the health service?

Why was the child taken to the health service?

Were you told what the child had? Yes [__] No [__]

If yes, what were you told the child had?

Was it explained to you what to do to treat the child? Yes [__] No [__]

If yes, what were you told was necessary to treat the child?

Were you offered an explanation as to why you needed to treat the child accordingly? Yes [__] No [__]

Did you agree with the diagnosis and treatment prescribed for the child? Yes [__] No [__]

Why or why not?

What treatment did you give the child after leaving the health service?

Did you take the child to the hospital? Yes [__] No [__]
If YES To which hospital did you take the child? [_____]
When did you take the child? [_____/_____/_____]
What treatment did the child receive? [_____]
How long was the child in the hospital? [_____]
If NO, Why didn't you take to the child to the hospital?
What treatment did you give instead of taking the child to the hospital? 1. [_____] 2. [_____] 3. [_____] 4. [_____]
Why did you give the child the aforementioned treatments?
During the visit, did a health worker recommend that you take the child to the hospital? Yes [__] No [__]
If yes and you did not follow through, why didn't you take to the child to the hospital?
Was the child cured? Yes [__] No [__] If yes, how long did it take? [_____]
Did you take the child back for another visit? Yes [__] No [__]
For illness? Yes [__] No [__] For follow-up? Yes [__] No [__]
On Hospital Access
Is the hospital less than one hour away from the health service? Yes [__] No [__]
By public transportation [__] On foot [__] By horse/mule/other [__]
Other (specify)
Do you incur any economic costs in terms of travel to, or care in the hospital? Yes [__] No [__]
Are these economic costs affordable for the population? Yes [__] No [__]
Remarks:

ANNEX 30.C
REASONS FOR NONCOMPLIANACE WITH HOSPITAL REFERRAL
DATA SUMMARY TABLE

Health Services/Region: _____ Period: _____ Study Group: _____

VARIABLE	TOTAL	YES	NO	NO INFORMATION
Parents did not agree with diagnosis and/or treatment prescribed by health workers				
Parents felt the hospital was too far away to take the child				
Parents felt that transportation and/or hospital care costs were too high				
Parents had no way to organize domestic responsibilities (care of other children, food preparation, household chores, etc.), in order to take the child				
Parents were unable to take off work in order to take to the child to the hospital				

ANNEX 30.C
REASONS FOR NONCOMPLIANACE WITH HOSPITAL REFERRAL (Cont.)
DATA SUMMARY TABLE

VARIABLE	TOTAL	YES	NO	NO INFORMATION
Parents did not feel the child's illness warranted a trip to the hospital				
Parents relied on alternative treatment options they felt were reliable				
Parents did not feel the child was critically ill, and thus did not require hospital treatment				
Parents felt the quality of care given at the hospital was poor				
Observaiones:				

Instructions for Completing the Data Summary Table:

1. All household survey forms corresponding to children that were not taken to the hospital by their parents should be seperated from the rest.

2. A data summary table should be prepared for each reason a child was referred, such as diagnostic studies—which can be subdivided into laboratory, radiology, internal consultation or specialist consultations—and hospitalization.

3. Separate household survey forms by both group and data summary tables, keeping in mind that forms should be sorted to the table with the most serious reason for referral. For example, if a child is referred to the hospital for hospitalization and also referred for laboratory examination, the form is to be included in data summary table for hospitalization.

4. Select one of the data summary tables and take the set of household survey forms corresponding to that reason for hospital referral. Observe the response to the question on whether or not parents/caregivers agreed with the diagnosis and/or treatment prescribed by health workers. If the response was yes, mark the **YES** column corresponding to that point in the data summary table; if the response was **NO** mark the corresponding column for this response; and if no information is available on that item, mark the **NO INFORMATION** column.

5. Continue with the next row on the data summary table, searching for the response to each item on the household survey form. It should be borne in mind that direct responses will not always be given. In such cases, the response should be determined by reading the open and closed responses contained on the form.

6. Continue in this manner until responses are complete for all factors included in the data summary table. Whenever a response has not been recorded on the form, mark under **NO INFORMATION**. It is only when registered that the family answered that not to one there asks closed or he stated that certain aspect did not constitute a problem, should be allocated within the **NO** column.

7. Once all rows of the data summary table have been completed for the first household survey form, continue on with the second form and so on, until completing all available household survey forms for each data summary table into which the entire sample of children was subdivided.

8. Once all data contained on household survey forms has been recorded, marks in the cells of each row should be tallied in order to obtain the **Total**.

PROTOCOL 31

FACTORS LINKED TO PARENTAL NONCOMPLIANCE WITH REEVALUATION AND FOLLOW-UP VISITS

INTRODUCTION

Parents and the family play a pivotal role in the health of children; not only are they responsible for care of children in the home, but also for determining when a child is sick and what to do about it. Since the family decides whether a child's illness warrants a visit to the health service, family attitudes also determine whether or not health workers' instructions regarding the treatment and care of the child are followed.

The ability of families to recognize the signs of childhood illness determines how early on they visit a health service. Likewise, this fact also has a significant impact on the rate of occurrence of serious disease (associated with delays in treatment), and on household deaths attributable to the lack of timely treatment.

Moreover, family attitudes regarding treatment recommendations made by health workers during the visit are essential with respect to the progression of the child's illness and, consequently, in terms of the number of cured cases and complications.

In either case, however, parental attitudes are influenced by numerous factors associated with the organization and the characteristics of care at health services. In some instances, no health services are located nearby where people can consult when children are sick, or there is a lack of convenient and accessibly priced transportation media. In others, people do not visit health services in the early stages of disease due to problems they encountered in previous consultations, such as long waits, poor treatment by health workers, and cost.

The lack of family compliance with treatment recommendations made by health workers during the consultation may not only be related to health workers' knowledge, attitudes, and practices, but also to the contents of these instructions and, primarily, the manner in which treatment instructions are given. Oftentimes, instructions for treatment are not adequately communicated to families, either because personnel use overly technical language to explain treatment, or because parents are not given adequate opportunity to ask questions. Moreover, parents are not provided with the information they need to solve potential difficulties that may arise while carrying out treatment instructions.

Although it always is important that the family follows through with treatment instructions in order to ensure that the child's condition will improve, when instructions include hospital referral, a lack of compliance can result in the rapid deterioration of health and threaten the life of the child.

The Integrated Management of Childhood Illness strategy includes general instructions for treating clinical manifestations, as well as some techniques for improving communication between health workers and parents. In the event that the child needs follow-up care to monitor the course of disease, the IMCI strategy includes an instructional component for teaching mothers about

reevaluation and follow-up visits and how to recognize the general danger signs that require the child to be taken immediately to the health service for care.

Because these are generalized instructions and recommendations, parents are sometimes unable to follow through with them. Since most children who receive treatment become better, parents may not consider it necessary to bring the child in for a reevaluation and follow-up visit. However, the reevaluation and follow-up visit is very important for health workers to determine that the child's condition is improving. Moreover, the reevaluation and follow-up visit also helps to reinforce program educational contents, thus improving parents' knowledge, attitudes, and practices regarding the care of children in the home.

An analysis of the possible reasons why parents do not comply with health worker instructions for reevaluation and follow-up visits will help identify factors that need to be taken into account by health workers in order to improve parental compliance with these visits.

OBJECTIVE

The objective of this study is to determine the most frequent causes of family noncompliance with health worker instructions to bring the child in for reevaluation and follow-up visits.

METHODOLOGY

One or more areas will be selected where the population has access to at least one health service. Accordingly, the families of children who received care in the aforementioned health service or services will form the basis of the study.

Steps for calculating the size of the study sample are described in Part II, Support Module for Statistical Methodology.

Once the survey population is defined, children who were attended at area health services over a given period and whom health workers classified and treated for a condition requiring follow-up treatment, such as pneumonia, acute otitis media, or anemia, will be identified. Accordingly, the selected health service(s) must have:

- A daily patient log to facilitate identification of cases attended over a given period;

- Either included in the daily patient log or in a separate registry—i.e. clinical history or outpatient care file—information regarding the consultation, especially that which pertains to the reason parents sought the consultation, classification of the illness/condition, and the treatment prescribed. Whenever possible, additional files containing instructions given to parents by the health worker are important. Of particular importance in this regard are the dates cited for the child's reevaluation and follow-up visit.

- Recorded the date of the child's visit and address, either in the daily patient log, the child's clinical history, or file.

The aforementioned data can be used to prepare a list of children attended at health services who were scheduled for a reevaluation and follow-up visit. Annex 31.A provides a model for recording this information. The procedure for this task is as follows:

1. Review the daily patient log beginning on the start date of the study and identify all children who were classified by the health workers as having some illness requiring follow-up. Table 31.1 lists the classifications that require subsequent follow-up in accordance with the IMCI strategy.

TABLE 31.1

CLASSIFICATION	RETURN FOR FOLLOW-UP
Pneumonia	After 2 days
Dysentery	
Malaria (if fever persists)	
Fever-malaria unlikely (if fever persists)	
Measles with eye or mouth complications	
Persistent diarrhea without dehydration	After 5 days
Acute Otitis Media	
Chronic Otitis Media	
Feeding problem	
Anemia	After 14 days
Very low weight for age	After 30 days

2. Check each case to see if health workers scheduled parent appointments for a reevaluation and follow-up visit, either in the daily patient log, clinical history, or the child's file. In instances where the health worker has done so, check the date of the scheduled appointment to help you find the reevaluation and follow-up visit. If the health worker has not noted this information, calculate the date of the reevaluation and follow-up visit based on IMCI strategy guidelines, taking into account any necessary scheduling conflicts (weekends, the days of the week health workers are on the job, etc.).

3. Next, go back to the daily patient log to see whether or not parents took the child to the reevaluation and follow-up visit on the date indicated, or within a timely period either prior to or after the scheduled appointment. In all cases, it is important to verify that the visit was actually for reevaluation and follow-up by examining the annotation made by the health worker in the daily patient log, clinical history, or child's file. This procedure will prevent you from recording a reevaluation and follow-up visit as one carried out for something else.

   In the event that the health service has set up a calendar file system to track compliance with visits for vaccination, growth monitoring, reevaluation and follow-up the illness, it can be used to identify children who did not return for follow-up.

4. Once all children who did not return for reevaluation and follow-up visits have been identified, pursuant to records at the health services, a household survey form is to be prepared for each.

5. Two approaches can be taken with respect to scheduling interviews to learn why a child was not brought in for a reevaluation and follow-up visit:

   - Wait for parents to return to the health service. When parents return to the health service to get care for another illness, vaccination, growth monitoring, nutrition, or development, use that opportunity to conduct interviews; or
   - Make home visits to parents.

The first approach involves a waiting period, which, consequently may take too long to compile sufficient data on the causes for noncompliance with reevaluation and follow-up visits. The second approach is the most feasible, since an interview can be conducted immediately following a missed reevaluation and follow-up visit, thus permitting greater data recovery. Annex 31.B provides a model household survey form that can be used to develop a suitable instrument for the study. The form includes a series of general data on the family that can be incorporated into the analysis of different population groups, differentiating among specific characteristics of these groups. In the event that this is not essential for the study, it should be eliminated in order to reduce interview time and strictly limit information to that necessary for the purposes of the study.

DATA PROCESSING

Once all interviews are completed, the resulting data are to be analyzed. As a first step, the number of children that attended the outpatient health services and were instructed to return for a reevaluation and follow-up visit must be determined, as well as how many of these children are logged in health service records as having followed through with the visit. The procedure for this task is as follows:

- Count the total number of children that were scheduled for a reevaluation and follow-up visit or the total number of children classified with a disease for which the IMCI strategy requires follow-up care;

- Count the number of these children for which a record of a reevaluation and follow up visit was found;

- Of the total number of children scheduled for a reevaluation and follow-up visit, calculate the percentage of children who returned for the visit (according to registries);

The aforementioned percentage can be calculated for the total number of children that were scheduled for a reevaluation and follow-up visit—or that need to be scheduled according to the IMCI strategy—, taking care to differentiate by type of classification or the period of time in which the reevaluation and follow-up visit should have taken place. This has applications in determining whether reevaluation and follow-up visits for certain diseases, or those that require monitoring for longer periods (7 or 14 days), represent higher rates of noncompliance than do others.

Subsequently, data obtained from household survey forms are used to:

- Determine the percentage of children for which no record was found to corroborate that they had been taken to a reevaluation and follow-up visit, but whose parents claim to have

followed through with the visit. (Whenever possible, it is important to verify whether parents claim is correct. For example, verify using the record of the visit on the child's card or another type of record given to parents.) This is very important because it will facilitate identification of record-keeping problems concerning the reevaluation and follow-up visits at the health services, or help in the search for the information at that service. In the event that the children initially classified as "not taken by parents to the reevaluation and follow-up visit" includes a large number of children who were taken but were not registered as such, the record-keeping system at the health service should be improved;

- Conduct a general evaluation of the reasons cited by parents or other caregivers that caused them to not to follow through with the child's reevaluation and follow-up visit prescribed by health workers;

- Classify these reasons into a reduced number of categories, in order to determine which factors are more frequently used as justification for noncompliance with the reevaluation and follow-up visit.

El porcentaje anterior puede calcularse para el total de niños a los que se indicó (o que necesitan de acuerdo a la estrategia AIEPI) una consulta de reevaluación y seguimiento, y discriminando por el tipo de clasificación, o por el lapso de tiempo en que debía realizarse la consulta de reevaluación y seguimiento. Esto puede ser de utilidad, para observar si las consultas de reevaluación y seguimiento debidas a ciertas enfermedades, o que deben realizarse en lapsos más prolongados de tiempo (7 o 14 días), tienen una mayor proporción de falta de cumplimiento que otras.

Posteriormente, y con base en los registros de las Fichas de Entrevista, se recomienda:

- Evaluar la proporción de los niños para los cuales no se encontró el registro de haber sido llevados a la consulta de reevaluación y seguimiento y cuyos padres afirman que cumplieron con la misma (de preferencia, sería de importancia verificar que esta afirmación es correcta, por ejemplo, a través del registro de la consulta en el carné del niño u otro tipo de registro que se entregue a los padres). Esto resulta de gran importancia puesto que permitirá identificar problemas en el registro de consultas de reevaluación y seguimiento en el servicio de salud, o en la búsqueda de la información en ese servicio. En caso que el número de niños que fueron inicialmente clasificados como "no llevados a la consulta de reevaluación y seguimiento por sus padres" incluya un gran número de niños llevados pero no registrados en el servicio, se deberá mejorar el sistema de registro del servicio de salud.
- Evaluar en forma general las razones expuestas por los padres u otros responsables del cuidado de los niños, que motivaron la falta de cumplimiento de la consulta de reevaluación y seguimiento que recomendó el personal de salud.

- Clasificar estas razones en un grupo reducido de categorías para poder determinar los factores que son más frecuentes como justificación de la falta de cumplimiento de la consulta de reevaluación y seguimiento.

These evaluations are recommended for the total number of children scheduled for a reevaluation and follow-up visit; for the different classifications of these children; or for the period of time

elapsing between the initial visit and follow-up. This is necessary since the reasons parents cite for noncompliance with health worker recommendations can be different for reevaluation and follow-up visits scheduled after 2, 5, 14, or 30 days.

The data summary table in Annex 31.C lists some factors that can be useful for developing small groups of categories for analysis. Nevertheless, a descriptive analysis of the reasons cited by families for not following through with the scheduled reevaluation and follow-up visit is always recommended as a first step. Subsequently, the conclusions of this analysis should be used as a basis for modifying and expanding the aforementioned categories. The preparation of additional tables is recommended in accordance with the classification of the child's illness, in order to evaluate the weight of the reasons cited by parents pursuant to the lapse of time after which they should return for the reevaluation and follow-up visit.

Additional Considerations

Families may offer a variety of reasons as to why they did not follow through with a recommendation to return with the child to the health service for a reevaluation and follow-up visit to monitor progress of the child's condition. Thus as a first step, it is advisable to compile an exhaustive list of these reasons, taking care not to group them unless they are equivalent. Particular categories can be defined during a second review of the list, for example, economic or family reasons, or the distance to a hospital, etc.

In addition to such categories, it is recommended that a category be included for assessing the importance that families attribute to returning for the reevaluation and follow-up visit, and whether that perception is affected by changes observed in the child's condition as a result of applying treatment. This is important since, in most cases, a family's decision as to whether or not to return with the child for the reevaluation and follow-up visit is based on its assessment of how necessary the visit is to the child's full recovery from the episode of disease. This assessment forms the basis for deciding whether or not the child's condition merits facing the difficulties involved in returning with the child for the reevaluation and follow-up visit.

The importance a family attributed to the reevaluation and follow-up visit (or failed to attribute) is to be included as a category in the data summary table. However, it should be borne in mind that the definition of this category requires a variety of data. This data should include the health worker's classification of the child's signs and symptoms, whether or not the family was offered an explanation as to the importance of the reevaluation and follow-up visit, how the family evaluated this explanation, and progress with respect to the child's clinical condition, since all these elements can provide both objective and subjective information regarding the degree to which the child was at risk as a result of not following through with the visit.

Table 31.2 includes examples of indicators that can be developed using the data collected.

TABLE 31.2

INDICATOR	NUMERATOR	DENOMINATOR
Percentage of children scheduled for a reevaluation and follow-up visit that did not return	Number of children who were scheduled by health workers for a reevaluation and follow-up visit that did not return	Number of children who were scheduled by health workers for a reevaluation and follow-up visit
Percentage of children classified as having pneumonia that did not return for the reevaluation and follow-up visit	Number of children classified by health workers as having pneumonia who did not return for the reevaluation and follow-up visit	Number of children classified by health workers as having pneumonia
Percentage of children that were not taken to a reevaluation and follow-up visit because parents believed the child was better	Number of children who were not taken to the reevaluation and follow-up visit because parents believed the child was better	Number of children who were not taken to the reevaluation and follow-up visit **minus** the number who were not taken to the visit and for which no information is available on the parents' perceptions as to whether or not the child's condition had improved
Percentage of children classified as having pneumonia that were not taken to the reevaluation and follow-up visit due to economic difficulties	Number of children classified as having pneumonia who were not taken to the reevaluation and follow-up visit because parents believed transportation costs to the new visit at the health service were too expensive	Number of children classified as having pneumonia who were not taken to the reevaluation and follow-up visit **minus** the number classified as having pneumonia who were not taken to the consultation and for which no information is available on the parents' opinion concerning the cost of the new visit
Percentage of children classified as having dysentery that were not taken to the reevaluation and follow-up visit because parents did not believe it was necessary	Number of children classified as having dysentery that were not taken to the reevaluation and follow-up visit because parents did not believe it was necessary	Number of children classified as having dysentery who were not taken to the reevaluation and follow-up visit **minus** the number classified as having dysentery who were not taken to the visit and for which no information is available on parents' opinions regarding the need to take the child to that visit

ANNEX 31.ST
FORM FOR CASES REQUIRING A REEVALUATION
AND FOLLOW-UP VISIT/CARE

Health Services/Region: _____

INITIAL VISIT AT OUTPATIENT HEALTH SERVICES						REEVALUATION AND FOLLOW-UP VISIT			
DATE	SURNAME AND NAMES	AGE	ADDRESS	DIAGNOSIS	TREATMENT	DATE	DIAGNOSIS	TREATMENT	PROGRESS

Observations:

ANNEX 31.B
REASONS FOR NONCOMPLIANCE WITH THE REEVALUATION AND FOLLOW-UP VISIT HOUSEHOLD SURVEY FORM

Child Identification Data:			
Child's full name:			
Age: [_____] Sex: [____] Date of birth: ____/____/____			
Mother's full name:			
Child's address:			
Date of interview: _____/_____/_____ Date of initial visit: _____/_____/_____			
Health service consulted:			
Diagnosis:			
Treatment:			
Family Composition (those living at the same address):			
Father Yes [__] No [__]	Grandmother Yes [__] No [__]		Siblings Yes [__] No [__]
Mother Yes [__] No [__]	Grandfather Yes [__] No [__]		Older NY[__]
Who cares for the child: [_____]			Younger NY[__]
Mother's education:	Primary [__] Yrs. [__]	Secondary [__] Yrs. [__]	Higher ed. [__]
Father's education:	Primary [__] Yrs. [__]	Secondary [__] Yrs. [__]	Higher ed. [__]
Caregiver's education	Primary [__] Yrs. [__]	Secondary [__] Yrs. [__]	Higher ed. [__]
Characteristics of Housing	Urban [__]	Rural [__]	
Number of rooms: [__]	Indoor water service: Yes [__] No [__]		Bathroom: Yes [__] No [__]
Latrine: Yes [__] No [__]	Eating area: Yes [__] No [__]		
Number of people who sleep per room: [__]	Number of people who sleep with the child: [__]		
On Prenatal Care			
Prenatal care given? Yes [__] No [__]	Health Center [__] Hospital [__]		
Other: _____			
Has prenatal care card? Yes [__] No [__]	Early monitoring? Yes [__] No [__]		
Periodic monitoring? Yes [__] No [__]			
On Child's Delivery and Feeding at Birth			
Where was the child born? Hospital [__]	Home [__]	Other: _____	
Has the child been with you since birth? Yes [__] No [__] Did you breast-feed the child? Yes [__] No [__]			
When did you first begin breast-feeding the child?			
Was the child given something before breast-feeding? Yes [__] No [__]			
If yes, what was the child given?			
In addition to breast milk, did you give the child anything else after leaving the hospital? Yes [__] No [__]			
If yes, what was the child given?			
Child Health Monitoring			
When was the first time you took the child in for a check-up visit?			
To whom did you take the child? Health service [_] Shaman [_] Other:			

When you take the child to a health service, which one do you go to (name and address)?

Does the child have a vaccination card? Yes [__] No [__]

Child's vaccinations up to date? Yes [__] No [__]

Does child have a growth-monitoring card? Yes [__] No [__] Is the card up to date? Yes [__] No [__]

Family and Child Care

Work Father Yes [__] No [__] Outside the home? Yes [__] No [__] Hours [____]

Mother Yes [__] No [__] Outside the home? Yes [__] No [__] Hours [____]

Do you have enough time to look after the child? Yes [__] No [__]

If no, list reasons:

	Who is at home?	Who takes care of the child?	Who feeds the child?
Morning			
Midday			
Afternoon			
Night			

On Care of the Child at the Health Service

When was the child taken in for a visit?

Who took the child to the health service?

Why was the child taken to the health service?

Were you told what the child had? Yes [__] No [__]

If yes, what were you told the child had?

Was it explained to you what to do to treat the child? Yes [__] No [__]

If yes, what were you told was necessary to treat the child?

Was it explained to you what to do to treat the child? Yes [__] No [__]

Did you agree with the diagnosis and treatment prescribed for the child? Yes [__] No [__]

Why or why not?

What treatment did you give the child after leaving the health service?

Did you take the child to the reevaluation and follow-up visit? Yes [__] No [__]

If YES To which health service did you take the child?

When did you take the child? [_____/_____/_____]

What were you told?

If NO, did the health worker tell you that you had to take the child to a reevaluation and follow-up visit? Yes [__] No [__]

Was it explained to you why you needed to take the child to the reevaluation and follow-up visit?	Yes [__] No [__]
What did the health worker tell you about why it was important to take the child to the reevaluation and follow-up visit?	
Did you agree with the health worker's explanation regarding the importance of the reevaluation and follow-up visit?	Yes [__] No [__]
Why didn't you take to the child to the reevaluation and follow-up visit?	
Was the child cured?	Yes [__] No [__]
If yes, how long did it take? [_____]	
Did you later take the child in for a visit?	Yes [__] No [__]
For illness?	Yes [__] No [__]
For follow-up?	Yes [__] No [__]
Health Service Access	
Is the health service less than one hour away from your home?	Yes [__] No [__]
By public transportation	On foot
By horse/mule	Other (specify)
Do you incur any economic costs in terms of travel to the health service or to get care?	Yes [__] No [__]
Can you afford these costs?	Yes [__] No [__]
Remarks:	

ANNEX 31.C
REASONS FOR NONCOMPLIANCE WITH REEVALUATION AND FOLLOW-UP VISITS

DATA SUMMARY TABLE

Health Services/Region: _____ Period: _____ Study Group: _____

VARIABLE	TOTAL	YES	NO	NO INFORMATION
Parents did not agree with diagnosis and/or treatment prescribed by health workers				
Parents felt the distance to the health service was too far away to take the child				
Parents felt that transportation to and/or care costs at the health service were too high				
Parents had no way to organize domestic responsibilities (care of other children, food preparation, household chores, etc.), in order to take the child to the reevaluation and follow-up visit				
Parents were unable to take off work in order to take the child to the reevaluation and follow-up visit				

ANNEX 31.C
REASONS FOR NONCOMPLIANCE WITH REEVALUATION AND FOLLOW-UP VISITS (Cont.)

DATA SUMMARY TABLE

ASPECT	TOTAL	YES	NO	NO INFORMATION
Parents were unable to spend the necessary time involved to taking the child to the reevaluation and follow-up visit				
Parents did not feel it was necessary to take the child to the reevaluation and follow-up visit since the child was already better				

Instructions for Completing the Data Summary Table:

1. From all the household survey forms, separate those for children who were not taken by their parents to the reevaluation and follow-up visit.

2. A data summary table should be prepared for each classification of disease, and associated with the corresponding timeframe for carrying out the reevaluation and follow-up visit.

3. Separate the household survey forms by both group and data summary table, keeping in mind that forms should be recorded in the table corresponding to the illness/condition requiring the shortest timeframe for carrying out the reevaluation and follow-up visit. For example, a child classified as having pneumonia and also acute otitis media would be recorded in the pneumonia data summary table, since the timeframe for the visit is only 2 days for pneumonia as opposed to 5 days for otitis media.

4. Select one of the data summary tables and corresponding household survey forms for that classification. Observe responses to the question on whether or not parents agreed with the diagnosis and/or treatment prescribed by health workers. If the response was yes, place a mark in the **YES** column on the row the question appears; if a no response was given, place a mark in the corresponding column; and if no information is available on that item, mark the **NO INFORMATION** column.

5. Continue with the next row of the data summary table, searching for the responses to each item on the household survey form. It should be borne in mind that direct responses will not always be given. In such cases, determine the response by reading the open-ended and closed responses contained on the form.

6. Continue in this manner until responses are complete for all factors included in the data summary table. Whenever a response has not been recorded on the form, mark under the **NO INFORMATION** column. A reason should only be recorded in the **NO** column when the family answered “no” to a closed question, or stated that the reason in question did not constitute a problem.

7. Once all rows of the data summary table have been completed for the first household survey form, continue with the second form, and so on, until completing all available forms for each data summary table into which the entire sample of children was subdivided.

8. Once all data contained on household survey forms have been transferred to the table, tally the marks in each row to obtain the **TOTAL**.

PROTOCOL 32

SOCIAL AND CULTURAL FACTORS THAT INFLUENCE THE NUTRITIONAL STATUS OF CHILDREN AGES 2 MONTHS TO 4 YEARS

INTRODUCTION

The nutritional status of children is the result of a significant number of factors. Among these is the availability of food, which plays an important although not a definitive role. The knowledge and beliefs of the mother and family on feeding the child, as well as the eating habits of the family group, will condition the way the child is fed. A variety of other factors have an impact on feeding decisions, including characteristics of the family, housing, life habits, as well as the mother's knowledge of the health and the general care of children.

In some populations, children are only allowed to have certain foods due to beliefs that have been passed down over several generations. The feeding practices of infants and children are largely determined by the family unit's perception of food—not merely as a growth process, but as a cultural fact.

In many cases, the dynamic of the family itself, together with cultural perceptions on child-rearing, also determine both the quantity and quality of food children receive during the first years of life. Whether or not families take their meals together, the time available to prepare food for and feed children, as well as the distribution of food among family members, all have an impact on the type and quantity of food the child receives, and, consequently, is of significant importance in terms of growth.

Most interventions that address child nutrition approach the problem by incorporating a systematic evaluation of children at the health services, aimed at detecting stunted growth. Additionally, a number of interventions target the child's recovery. These measures come into play in cases where nutritional status is found below *normal* parameters and include food supplementation and instructions on the appropriate feeding of children. Nevertheless, both of these interventions have met with serious limitations.

Food supplementation is generally carried out over short periods of time, either until the nutritional status of the child is again within normal parameters, or the child reaches a certain age. In any case, the effectiveness of this type intervention on the nutritional status of children varies, depending on how these foods are distributed for consumption by all members of the family unit (foods are not consumed exclusively by the child). In many cases, both the quantity and quality of food reaching children is insufficient for nutritional recovery.

Child feeding recommendations for mothers are often not enough to make a positive impact on the beliefs and behaviors practiced by the mother and family in this regard. At times, these recommendations are based on incomplete knowledge of the practical difficulties mothers must face (i.e. housing characteristics and the dynamic of family life) in order to implement them.
Improving community knowledge, beliefs, and child feeding practices, are among the objectives of the IMCI strategy. For this reason, the strategy includes an important component on the edu-

cation of the mother and family. Implementation of the IMCI strategy is expected to bring about a progressive change in community knowledge, beliefs, and practices regarding child feeding.

However, achieving this objective requires a more in-depth understanding of some specific factors associated with the cultural and social determinants of the feeding process in order to effectively adapt the educational component of the IMCI strategy to the specific reality of each community.

OBJECTIVE

To determine the social and cultural factors influencing the nutritional status of children between the ages of 2 months and 4 years.

METHODOLOGY

Target population

The target population will be mothers of children under 5 years who live in the area of influence of health services carrying out the IMCI strategy. This population can be subdivided in accordance with several variables, such as whether or not they go to a health service for the child's medical and follow-up care; nutritional status and degree of malnutrition; and whether this concerns the mother's first child, etc. Given that a variety of population groups are being studied, comparisons can be drawn among them. For example, by examining the cultural and social factors of families with a malnourished child less than 5 years or of those of families with a well nourished (eutrophic) child in this age group. Likewise, the population can be disaggregated by the degree of malnutrition (low weight-for-age, very low weight-for-age and severe malnutrition); or according to whether or not the child is brought to the health service for follow-up care, by social situation; or in accordance with indicators of unmet basic needs.

Upon studying families with more than one child in the under-5 age group, the influence of parenting and feeding experience of the first children should be taken into account. Likewise, this variable must be factored in when making comparisons in such cases to avoid influencing results.

The social and cultural characteristics of the population may also be studied, both before and after health services implement the IMCI strategy, with a view to observe changes that occur, which may be attributed to the strategy's implementation. Accordingly, IMCI implementation implies that:

- Health service staff have received training in the theoretical and practical contents of the strategy's implementation, preferably having attended an IMCI clinical course;
- Trained staff at health services have access to the supplies needed to carry out recommendations for assessing and treating children;
- Health workers trained in the IMCI strategy are capable of analyzing and solving problems, difficulties, and questions concerning correct implementation of the strategy, through follow-up visits and of periodic supervision, both direct and indirect;

The community served at the health service has access to educational activities. These include interpersonal activities—whether prior to, during or after the visit—and those carried out as a group, including talks, meetings, and other similar activities.

Upon conducting studies prior to and following implementation of the IMCI strategy, it should be borne in mind that the strategy includes components for diagnosing and treating the child, as well as for improving education of the family on how to care for the child in the home. Accordingly, the latter of these will have the greatest influence on the family's knowledge, beliefs, and practices concerning the child's feeding.

For this reason, it is important to ensure that health workers devote the necessary time and have access to the appropriate materials and methodologies to carry out IMCI recommendations for the education of caregivers on feeding children.

In the event that the target population is served by more than one health service, care should be taken to ensure that the activities carried out at the selected health services are similar, especially with respect to the education of families on feeding children.

Assessment

Essentially, the assessment entails investigating a variety of family characteristics, beliefs, feeding practices, and other cultural and social considerations that can influence the nutritional status of children. Moreover, the evaluation should also include the nutritional classification of the child, carried out in accordance with IMCI strategy criteria.

The household survey form provided in Annex 32.A can be used to evaluate and record the social and cultural characteristics of families. The form should be adapted to the study area; hence, the addition of other factors warranting analysis may be necessary. A form should be completed for each of the families selected for the study.

Because specific information is sought on family behavior toward each child, when surveying families with more than one child, separate forms should be completed for each. However, the general information on the form need only be completed once for each family.

Information regarding the nutritional status of the child can be obtained from health service records. However, the date of the last nutritional status assessment should be taken into account, as data from older assessments may no longer be relevant. This problem can be avoided by conducting a new nutritional status evaluation of the child at the time the survey form is completed.

Another way to avoid this problem is to include within the study, all children visiting the health service(s), from a specific date, who meet target population criteria. In the event that the study also aims to capture data on families that do not regularly seek care at health services, home visits can be scheduled to this end, during which the interviewer can carry out nutritional status evaluations for each child.

Evaluation Techniques for Determining the Social and Cultural Factors that Influence Child Nutritional Status

An assessment of social and cultural factors should be carried out by means of a conversation with the child's mother or caregiver. This conversation should take place in a comfortable, cordial setting. Ideally, this conversation should take place where the adult and child live, or in a location acceptable for them, if not within the home itself.

The tone of the conversation will determine the reliability of the information obtained. Thus, the surveyor's attitude is key to preventing feelings of guilt or sensations of saying or doing something incorrect on the part of the person surveyed.

The form in Annex 32.A contains questions designed to obtain information on a set of crucial factors. These factors should be reviewed, modified and/or complemented, according to the needs of the study.

Ideally, the form should act as a guide for the information to be obtained by the interviewer and not necessarily as an instrument to be used during the interview with the mother or caregiver. The interviewer should investigate all the aspects included on the form (or those considered relevant) during the interview, recording the corresponding responses on the form at the end of the process.

Because, in most cases, this will be no easy task—and more difficult still for forms containing greater information inputs—the interviewer needs to be especially mindful of how the form is introduced and completed in the presence of the mother so as to not create a sensation of her being *examined*, which may gear her responses toward seeking *approval* of the interviewer.

A variety of open-ended questions should be included during the conversation, in order to provide the mother with opportunities to freely express her opinions on aspects covered in the study. The form contains several open-ended questions, as well as a number of closed questions on more specific aspects. Responses to most of these questions can be obtained over the course of the conversation with the mother.

As a means of supplementing the information obtained in the interview with the mother, completion of the form *Food Consumed by the Child in the Home* (introduced in Protocol 15 of this compendium) is recommended. This form provides information as to how the child (subject of the interview) was fed on the days leading up to the interview and opportunities to test the veracity of the theoretical information provided.

The form *Food Consumed by the Child in the Home* should be completed at the time of the interview for the interview date and for all days prior that the mother is able to remember. While the file is being completed, the interviewer should ask additional questions in order to obtain more information regarding: why the mother gave the foods listed; how the child was fed (child fed himself, someone helped to feed the child, who fed the child, etc.); whether or not the child had problems ingesting food; whether or not the child received some type of stimulus to eat, etc. Instructions for completing the form *Food Consumed by the Child in the Home* are included in Protocol 15 of this compendium.

Tamaño de la población a estudiar

Los pasos para el cálculo del tamaño de la muestra a estudiar se describen en la sección de la Parte II, Módulo de Apoyo en Metodología Estadística, sobre investigaciones de estimación y en las que se realiza una Comparación entre la Situación Anterior y la Posterior a la Implementación de la Estrategia AIEPI. El número de niños a evaluar deberá ajustarse según los grupos diferentes en que se quieran analizar los factores sociales y culturales que afectan el estado nutricional del niño, por ejemplo, si se decide evaluar esto en función de la edad del niño.

Registro y consolidación de los datos

El registro de la información se realizará en la Ficha incluida en el anexo 32.A, con las modificaciones que se consideren necesarias de acuerdo a lo que se indicó más arriba. Con respecto a la consolidación de los datos, se debe tener en cuenta el gran número de variables que podrán ser estudiadas en función de las que se hayan incluido dentro de la Ficha. Estas variables podrán ser estudiadas para toda la población objeto del estudio, o para los distintos subgrupos en que se dividió a la población.

El Anexo 32.B incluye una lista de algunas variables de estudio que se consideran de importancia, las que pueden ser complementadas en función de las necesidades. Estas variables pueden ser transformadas en indicadores tal como se muestra en el mismo anexo.

Para procesar la información pueden grabarse las fichas en un programa Epi Info y procesar las variables que se considere de interés para toda la población así como para los diferentes subgrupos. Para el procesamiento manual de la información puede utilizarse un formato de tabla como el incluido en el Anexo 32.C, confeccionado para algunas de las variables que se incluyeron en el Anexo 32.B.

Debe tenerse en cuenta que a partir de este estudio también se obtiene información cualitativa que puede resultar de gran importancia para orientar las acciones en los servicios de salud.

Sample Size

Steps for calculating the size of the study sample are described in Part II, Support Module for Statistical Methodology, which provides a comparison of the situation before and after implementation of the IMCI strategy. The number of children studied should be adjusted in accordance with the different groups for which information is sought regarding social and cultural factors that affect child nutritional status (i.e. social and cultural factors influencing nutritional status by age of the child).

Recording and Summarizing Data

Data will be recorded on the form provided in Annex 32.A, and will include any modifications deemed necessary, according to the criteria set out previously. With respect summarizing the data, consideration should be given to the large number of variables that can be studied with respect to those included within the form. These variables can be studied either for the entire target population, or for its different subgroups.

Annex 32.B includes a list of some important study variables that can be complemented according to need. Moreover, Annex 32.B shows how these same variables can be made into indicators.

In order to process the data, forms can be recorded in an Epi Info program. The program processes variables that are considered of interest to the entire population, as well as for the different subgroups. A table format can be used to process data manually, such as the one provided in Annex 32.C, which was prepared for some of the variables that were included in Annex 32.B.

It is also important to keep in mind that qualitative information is obtained from this study, which may have important applications in terms of orienting activities at the health services.

Qualitative variables should be extracted from each form for each aspect or question. For example, *when the child does not eat it is because he/she is sad*, or *if the child does not eat*, *there is no reason to insist that he/she should eat*, or *the child must be given water prior to being breastfed in order to clean out his/her stomach*, etc.

In the event that common or equivalent statements exist—or if a model for establishing equivalencies has been prepared—, the number of mothers that stated a single concern, idea, etc., can be quantified.

Finally, if establishing differences among the different subgroups regarding some study variables is desired, it should be borne in mind that statistical tests of significance are needed in order to prove correlations between nutrition and these variables. See the Support Module for Statistical Methodology in Part II.

ANNEX 32.A
SOCIAL AND CULTURAL FACTORS THAT INFLUENCE CHILD NUTRITIONAL STATUS HOUSEHOLD SURVEY FORM

Localidad/Servicio de Salud: _____ Período: _____

Child Identification Data:			
Child's full name:			
Age: [__] Sex: [____] Weight: [_____] Height: [_____] P. Cephalic: [_____]			
Mother's marital status	Stable union Yes [__] No [__] Single [__]	Cohabiting Yes [__] No [__] Unstable union Yes [__] No [__]	
Mother's education:	Primary [__] Yrs. [__]	Secondary [__] Yrs. [__]	Higher ed. [__]
Father's education:	Primary [__] Yrs. [__]	Secondary [__] Yrs. [__]	Higher ed. [__]
Caregiver's education:	Primary [__] Yrs. [__]	Secondary [__] Yrs. [__]	Higher ed. [__]
Family composition (those living at the same address):			
Father Yes [__] No [__]	Grandmother Yes [__] No [__]	Both Yes [__] No [__]	
Mother Yes [__] No [__]	Grandfather Yes [__] No [__]	Both Yes [__] No [__]	
Siblings Yes [__] No [__]	Older Yes [__] No [__] How many? [_____]	Younger Yes [__] No [__] How many? [_____]	
Characteristics of housing			
Urban [__] Rural [__]	Number of rooms: [__]	Indoor water service: Yes [__] No [__]	
Bathroom: Yes [__] No [__]	Latrine: Yes [__] No [__]	Eating area: Yes [__] No [__]	
Number of people who sleep per room: [_____] Number of people who sleep with the child: [_____]			
Prenatal Care			
Prenatal care given Yes [__] No [__] Health Center [__] Hospital [__] Other: _____			
Has prenatal care card? Yes [__] No [__] Early monitoring? Yes [__] No [__]			
Periodic monitoring? Yes [__] No [__]			
On Information about Feeding Prior to Child's Birth			
Before was the child born, did you think about how you were going to feed your child? Yes [__] No [__]			
How did you think you were going to feed your child?			
Before was the child born, did you receive information on how to feed your child? Yes [__] No [__]			
If yes, from whom did you receive this information and what were you told? (complete for each of the following)			
Health workers			
Family Member			
Neighbor			

Traditional physician
Other:
Child Delivery and Feeding at Birth
Where was the child born? Hospital [__] Home [__] Other: _____
Has the child been with you since birth? Yes [__] No [__] Did you breast-feed the child? Yes [__] No [__]
When did you first begin breast-feeding the child?
Was the child given something before breast-feeding? Yes [__] No [__]
If yes, what was the child given?
Who instructed you to give the child something?
Health workers [__] Family member [__] Other:_____
For what?
In the hospital, were you given any instructions on feeding the child? Yes [__] No [__]
What instructions were given?
Were you given some food for the child upon leaving the hospital? Yes [__] No [__]
If yes, what were you given?
In addition to breast milk, did you give the child anything else after leaving the hospital? Yes [__] No [__]
If yes, what was the child given?
Why was it given to the child for?
Child Health Monitoring and Feeding
When was the first time you took the child in for a check-up visit?
To whom did you take the child? Health services [__] Shaman [__] Other:
Did you enquire about the child's feeding? Yes [__] No [__]
Were you given information on feeding? Yes [__] No [__]
What information did you receive regarding the child's feeding?
How did you feed the child?
During the first Month Breast milk Yes [__] No [__] Other:
Month 1 to 2 Breast milk Yes [__] No [__] Other:
Month 2 to 3 Breast milk Yes [__] No [__] Other:
Month 3 to 4 Breast milk Yes [__] No [__] Other:
Month 4 to 5 Breast milk Yes [__] No [__] Other:
Month 5 to 6 Breast milk Yes [__] No [__] Other:
Month 6 to 11 Breast milk Yes [__] No [__] Other:
Month 12 to 18 Breast milk Yes [__] No [__] Other:
After month 18 Breast milk Yes [__] No [__] Other:

Does the child have a vaccination card? Yes [__] No [__] Child's vaccinations up to date? Yes [__] No [__]				
Does child have a growth-monitoring card? Yes [__] No [__] Is the card up to date? Yes [__] No [__]				
Family Dynamic and Child's Feeding				
Work Father Yes [__] No [__] Outside the home? Yes [__] No [__] Hours				
Mother Yes [__] No [__] Outside the home? Yes [__] No [__] Hours				
Do you have enough time to look after the child? Yes [__] No [__]				
If no, why not?				
	Who is at home?	Who takes care of the child?	Who feeds the child?	
Morning				
Midday				
Afternoon				
Night				
Who helps feed the child? Grandmother [__] Father [__] Other: _____				
How do they help?	Grandmother	Father	Siblings	Other
Preparing food				
Feeding child				
Other:_____				
Does the child eat by himself? Yes [__] No [__]				
Is the child stimulated to eat? Yes [__] No [__]				
If yes, how is the child stimulated to eat?				
Does the family eat together sometime during the day? Yes [__] No [__] Morning: [__] Evening: [__] Noon [__] Night [__]				
Does the child eat with the rest of the family? Yes [__] No [__]				
Mother's Opinion on Child's Feeding				
What do you think about how the child is growing?				
Why?				
What foods do you think are best for the child?				
During the first 4 months:				
Between 4 and 6 months				
Between 6 and 12 months				
After age 1				

How old do you think your child needs to be before he/she can eat all kinds of food?
Where do you get information about foods to give the child?
Who do you believe should feed the child?
Are there times that child does not want to eat? Yes [__] No [__]
What do you think are the reasons the child sometimes does not want to eat?
What do you think should be done when the child does not want to eat?
What do you do when the child does not want to eat?

ANNEX 32.B
SOCIAL AND CULTURAL FACTORS INFLUENCING CHILD NUTRITIONAL STATUS

The list below contains some social and cultural variables that can be studied using the information obtained on the form provided in Annex 32.A. Based on the information collected on the form, it is possible to analyze other variables. Additional variables could be studied if questions about these variables are included on the form. In addition to the variables, the indicators below can be used to analyze the information.

ASPECT	SUGGESTED INDICATOR
Mother's/caregiver's education	Caregiver's average number of years of schooling
	Knows how to read and write (YES/NO)
Prenatal care	Pregnancy with prenatal care visits (YES/NO) Average number of prenatal care visits during pregnancy First prenatal care visit before the fifth month (YES/NO) At least 5 prenatal visits before delivery (YES/NO)
Information on child feeding received before child was born	Received information from health workers on how to feed the child during prenatal care visits (YES/NO) Exclusive breast-feeding for at least 4 to 6 months was recommended (YES/NO)
Practice of breast-feeding	Child was breast-fed within the first hour after delivery (YES/NO) Child received any other liquid or food before breast-feeding (YES/NO) Mother and child remained together throughout the period in the maternity ward (YES/NO) Exclusive breast-feeding up through the 4th/6th month (YES/NO) Began breast-feeding in the place where the child was born (YES/NO)
Child's Immunization	Complete vaccination series for the child's age (YES/NO)
Perception of the time that has the mother to serve the child	Enough time to look after the child (YES/NO)

ASPECT	SUGGESTED INDICATOR
Child's caregiver	Grandmother in charge of child (YES/NO) Child < 10 years in charge of another child (YES/NO)
Characteristics of feeding time	Child is stimulated in order to eat (YES/NO) Child eats by himself/herself (YES/NO) Child eats together with the family (YES/NO)
Assistance mother receives in terms of child feeding	Support of a grandmother for child feeding (YES/NO) Support of father for child feeding (YES/NO) Child is fed indistinctly by mother or father (YES/NO)

ANNEX 32.C
SOCIAL AND CULTURAL FACTORS INFLUENCING
CHILD NUTRITIONAL STATUS
DATA SUMMARY TABLE

Study Group: _____ Subgroup: _____

INDICATOR	YES	NO	TOTAL
Child's caregiver knows how to read and write			
Mother participated in prenatal care visits			
Mother had first prenatal care visit before the fifth month of pregnancy			
Mother practiced exclusive breast-feeding up through the fourth/sixth month of life			
Child less than 10 years of age in charge of child			
Child receives stimulus in order to eat			
Father helps feed the child			

Observations:

PROTOCOL 33

ACCESS FACTORS AND PATTERNS OF CARE OF THE CHILD ASSOCIATED WITH HOUSEHOLD MORTALITY IN CHILDREN BETWEEN THE AGES OF 2 MONTHS AND 4 YEARS

INTRODUCTION

Although household deaths of children under 5 years occur in all countries, their frequency and causes vary. In the developed countries, most deaths of under-5 children occur at health care institutions, whereas a low number of deaths occur in the home. The majority of the deaths are due to accidents, sudden death, or other sudden causes. In the developing countries, however, the number of deaths of under 5 years children occurring in the home is greater. Many such deaths are due to preventable illnesses or diseases that can be adequately diagnosed and treated early, thus notably reducing the risk of becoming more serious and death.

The higher incidence of household deaths among children in the developing countries is associated with problems of access to health services, factors linked to the care of children in the home, and the moment parents decide a child should be taken to the health service. Generally, factors associated with access to health services refer not only to the distance parents must travel to seek care for their children, but also to frequent limitations. Examples of such limitations include staff that is not always available, certain costs involved in obtaining care, or the treatment received by staff is not appropriate for the population.

Factors regarding the use of the health services, however, are generally associated with differing perceptions of disease and how to treat it in children, as well as alternative methods of care (example: shamans, traditional health workers).

An understanding of the level and significance of household mortality among under 5 years children, as well as the characteristics of family access to and use of health services, is key to implement activities aimed at controlling the problem. This is especially true upon considering that the approach to factors associated with the lack of access differs from the approach to factors associated with criteria for the use of health services and the care of children in the home held by the population.

Implementation of the Integrated Management of Childhood Illness strategy has enormous potential for improving access to care for children's health problems, care of children in the home, and the perception of risk on the part of parents and family. For this reason, analysis of the characteristics of access to and use of health services by families in which a household death has occurred can be an important tool for strengthening activities aimed at risk groups of the population, thus contributing to the prevention of future episodes of disease.

OBJECTIVES

- Determine the access to health care of families for which a household death due to disease was recorded for a child between the ages of 2 months and 5 years.

- Describe the general characteristics of care provided to children between the ages of 2 months and 5 years by families in which a household death due to disease occurred.

METHODOLOGY

In order to meet the proposed objectives, analysis is needed both in terms of access to and the characteristics of care provided to children in the home in households that have experienced the death of a child between the ages of 2 months to 5 years due to disease.

1. First, determine the number of deaths of children between the ages of 2 months and 5 years that occurred in the study area over a given period. This calculation can be based solely on records of registered deaths, or complemented (or corrected) upon investigating other data sources, such as key people in the community, cemeteries, churches, etc.

2. Upon consolidating the information on deaths of children between the ages of 2 months and 5 years that occurred in the study area over a given period:

    2.1. Determine whether the cause of each death was due to disease or an accident. This information can be obtained from death certificates and health service registries. This information can then be further complemented (or corrected), based on interviews with the families of each child.

    2.2. Determine the access to care of each family in which a death occurred. This can be calculated based on information available through existing health service networks in the area, their hours of operation, and different modes of transportation that can be used (according to the hour of the day) to get to health services. Moreover, family interviews will facilitate additional information regarding cost, interaction with health workers, etc.

    2.3. Identify patterns of care of the child in the home for each family in which there was a household death of a child between the ages of 2 months to 5 years.

3. Calculate some indicators that help to characterize families in which there was a household death due to disease of a child between the ages of 2 months and 5 years.

Annex 33.A provides a household survey form for recording information on access to and use of health services with respect to families that experienced the death of a child between the ages of 2 months and 5 years.

The upper part of the form is for recording information obtained from death certificates and health service registries, while the remainder of the form is to be completed during the interview. It is recommended that information on access to the health service be obtained through observation of and questions addressed to the family, since a family's perception of access is the factor that ultimately determines its behavioral pattern.
The variables included on the form should be reviewed pursuant to the characteristics of the area and the population under study. Other variables can be added to the form as necessary.

The data collected on the forms can be recorded into a database program, such as an EPI Info or similar program. Even in cases where this procedure is not followed, some information can be obtained by consolidating some of the variables manually.

DATA PROCESSING

Once all household survey forms are completed, the data obtained are to be analyzed. As a first step in this process, it is helpful to determine how many deaths of children between the ages of 2 months and 5 years occurred in the home as a result of disease. Review the household survey forms and sort them based on the diagnosis listed on death certificate, health services registries, and on information provided by the family on the disease or accident that caused the child's death.

If data processing is to be done by computer, the household summary forms should be recorded, or, alternatively, prepare a data summary table based on the one provided in Annex 33.B. Additional variables of interest can be included in the table as needed. In the event that the total group is to be divided according to several variables, then a data summary table should be prepared for each group to be studied. It should always be taken into account that subdividing household deaths according to causes covered in the IMCI strategy does not result in too small a number of deaths by subgroup.

Table 33.1 includes some sample indicators that can be calculated from the information collected. Based on the indicators contained in the table, additional indicators can be developed from the variables included in the household survey form.

It is possible to compare the percentages of some or all the variables studied of families that experienced a household death of a child between the ages of 2 months and 5 years due to disease with those observed in other families. For example, this could be done by applying the household survey forms to families that have experienced the death of a child due to disease, but which occurred in the hospital.

Thus, it is possible to compare some characteristics of access to or care of the child in the home between families that experienced a household death of a child and families that experienced the death of a child that occurred in the hospital. The design of this type of study and the steps for calculating the size of the study sample are described in Part II, Support Module for Statistical Methodology.

A similar comparison could be carried out based on interviews of families with children who were hospitalized with a disease that did not result in death.

TABLE 33.1

INDICATOR	NUMERATOR	DENOMINATOR
Percentage of families that experienced a household death of a child between the ages of 2 months and 5 years due to disease, and have no access to health workers or a health service	Number of families that experienced a household death of a child between the ages of 2 months and 5 years due to disease, and that live less than an hour away from a health service or health workers, or that feel they do not have access to health care	Total number of families that experienced a household death due to disease, and from which information was obtained on access to a health service or to health workers
Percentage of families that experienced a household death of a child between the ages of 2 months and 5 years due to disease in which the child was left in the care of an older brother/sister	Number of families that experienced a household death of a child between the ages of 2 months and 5 years due to disease in which the child was left in the care of an older brother/sister	Total number of families that experienced a household death of a child between the ages of 2 months and 5 years due to disease, and from which information was obtained on this aspect
Percentage of families that experienced a household death of a child between the ages of 2 months and 5 years due to disease in which the child did not have a complete vaccination series	Number of families that experienced a household death of a child between the ages of 2 months and 5 years in which the child did not have a complete of vaccination series	Total number of families that experienced a household death of a child between the ages of 2 months and 5 years due to disease, and from which information was obtained on this aspect

ANNEX 33.A
ACCESS FACTORS AND CHILD CARE PATTERNS ASSOCIATED WITH HOUSEHOLD MORTALITY IN CHILDREN BETWEEN THE AGES OF 2 MONTHS AND 5 YEARS

HOUSEHOLD SURVEY FORM

Child Identification Data:
Child's full name:
Age at the time of death: [____] Sex: [___] Date of birth: ____/____/____
Mother's full name:
Child's address:
Date of interview: _____/_____/_____ Date of death: _____/_____/_____
Cause of death (according to death certificate): 1. _____ 2. _____ 3. _____
Family Composition (those living at the same address):
Father Yes [__] No [__] Grandmother Yes [__] No [__] | Siblings Yes [__] No [__]
Mother Yes [__] No [__] Grandfather Yes [__] No [__] | - Older NY[_____]
Others: [_____] | - Younger NY[_____]
Mother's education: Primary [__] Yrs. [__] Secondary [__] Yrs. [__] Higher ed. [__]
Father's education: Primary [__] Yrs. [__] Secondary [__] Yrs. [__] Higher ed. [__]
Caregiver's education Primary [__] Yrs. [__] Secondary [__] Yrs. [__] Higher ed. [__]
Characteristics of Housing
Urban [__] Rural [__] Number of rooms: [__] Indoor water service: Yes [__] No [__]
Bathroom: Yes [__] No [__] Latrine: Yes [__] No [__] Eating area: Yes [__] No [__]
Number of people who sleep per room: [__] Number of people who sleep with the child: [__]
Prenatal Care
Prenatal care given Yes [__] No [__] Health Center [__] Hospital [__] Other: _____
Has the Prenatal Card? Yes [__] No [__] Early monitoring? Yes [__] No [__] Periodic monitoring? Yes [__] No [__]
Child Delivery and Feeding at Birth
Where was the child born? Hospital [__] Home [__] Other: _____
Has the child been with you since birth? Yes [__] No [__] Did you breast-feed the child? Yes [__] No [__]
When did you first begin breast-feeding the child?
Was the child given something before breast-feeding? Yes [__] No [__]
If yes, what was the child given?
In addition to breast milk, did you give the child anything else after leaving the hospital? Yes [__] No [__]
If yes, what was the child given?

Health Care of Child that Died

When was the first time you took the child in for a check-up visit?

To whom did you take the child? Health services [__] Shaman [__] Other:

When you took to the child to the health service, to what health service did you take it (name or address of health service)?

Does the child have a vaccination card? Yes [__] No [__]

Child's vaccinations up to date? Yes [__] No [__]

Does the child have a growth-monitoring card? Yes [__] No [__]

Is the card up to date? Yes [__] No [__]

Family Dynamic and Care of the Child

Work Father Yes [__] No [__] Outside the home? Yes [__] No [__] Hours [___]

Mother Yes [__] No [__] Outside the home? Yes [__] No [__] Hours [___]

Did you have enough time to look after the child? Yes [__] No [__]

Why or why not?

	Who is at home?	Who took care of the child?	Who fed the child?
Morning			
Midday			
Afternoon			
Night			

Death of the Child Was child sick before it died? Yes [__] No [__]

What signs of disease did the child have before its death?

What caused the child's death? Disease [__] Accident [__] Unable to specify [__]

Did you seek care for the child's disease? Yes [__] No [__]

Who looked after the child? Health Workers [__] Shaman [__] Other:

How long after the signs appeared did the child receive treatment? [___] days [__] hours

Were you told what the child had? Yes [__] No [__]

If yes, what were you told the child had?

Was it explained to you what to do to treat the child? Yes [__] No [__]

If yes, what were you told was necessary to treat the child?

Was it explained to you what to do to treat the child? Yes [__] No [__]

Did you agree with the diagnosis and treatment prescribed for the child? Yes [__] No [__]

Why?

What treatment did you give the child given for the disease (if response includes a drug, specify the drug in question)?

Why did you give the child those treatments?

Health Service Access
Is the health service less than 1 hour of housing? Yes [__] No [__]
By public transportation [__] On foot [__] By horse/mule [__]
Other (specify)
Are there economic costs involved in the transport to and care at the health service? Yes [__] No [__]
Are the economic costs affordable for the population? Yes [__] No [__]
Remarks:

ANNEX 33.B
ACCESS FACTORS AND PATTERNS OF CARE OF THE CHILD ASSOCIATED WITH HOUSEHOLD MORTALITY IN CHILDREN BETWEEN THE AGES OF 2 MONTHS AND 5 YEARS

DATA SUMMARY TABLE

Health Services/Area: _____ Period: _____ Study Group: _____

VARIABLE	TOTAL	YES	NO	NO INFORMATION
The child was taken to a health worker or health service in order to receive care for the disease that caused death				
Dwelling is located at a distance of 1 hour or less from the health service, using habitual forms of transport available in the community				
The health service or health workers were accessible (at a distance of 1 hour or less) 6 hours prior to death				
Parents feel the health service is too far away to visit				
The cost of transportation to and/or care at the health service is considered too high				

VARIABLE	TOTAL	YES	NO	NO INFORMATION
Parents/caregiver of the child feels the waiting period for care at the health service is too long				
The health service or health workers are not sources of consultation the family uses for episodes of disease in children				
Parents/caregiver did not feel the child's illness warranted a trip to the hospital				
Parents/caregiver relied on alternative treatment options they felt were reliable				
Parents/caregiver did not feel the child was critically ill, and thus did not require treatment at a hospital				
Parents/caregiver felt that the quality of care given at the hospital was inadequate				
The child's vaccination series was not up to date				
The child did not have periodic follow-up care				
The child spent most of the time in the care of a brother/sister				
Parents/caregiver did not feel that the health service provided quality services				

Observations:

Instructions for Completing the Data Summary Table:

1. Upon determining the categories into which the set of household deaths is to be subdivided, prepare a data summary table for each. For example, deaths can be separated on the basis of the child's age (children from 2 to 11 months, children from 1 to 4 years).

2. Separate the household survey forms in as many groups as data summary tables that have been prepared.

3. Next, select one of the data summary tables and pick up the corresponding pile of forms. Examine the first form and locate the information sought for each aspect included in the first column of the data summary table, then place a mark in the appropriate column of the table. For example, if the dwelling is located at a distance of an hour or less to the health service where the child was attended prior to death, place a mark in the **YES** column; otherwise, mark the **No** column. If no information is available on a particular aspect, place a mark in the **NO INFORMATION** column.

4. Once all rows of the data summary table have been completed for the first household survey form, continue with the second form, and so on, until completing all available forms for the data summary table.

5. Repeat this procedure for each one of the data summary tables developed to collect data.

6. Once all data contained on the household survey forms have been transferred, tally the marks in each row of the data summary tables to obtain the **Total**.

PROTOCOL 34

CORRELATION BETWEEN ASTHMA AND SMOKING IN THE HOME

INTRODUCTION

Air quality inside the home has been mentioned repeatedly as risk factor that can significantly increase the incidence and severity of respiratory diseases in children, taking into account the number of hours children spend inside the home. Smoke generated from the consumption of biomass fuels for cooking and home heating, as well as cigarette smoke, are the primary air pollutants found inside the home and are often associated with an increased incidence of *child respiratory diseases*. In turn, the irritation of mucous membranes caused by these contaminants is linked to the increased duration and severity of some episodes of respiratory disease, generally due to the body's reduced capacity to ward off infection.

In terms of controlling child respiratory diseases, the main recommendation is to contain sources of pollution. The pollution generated through the consumption of biomass fuels can be eliminated by instead using alternative energy sources with lower environmental pollution indices. However, this kind of substitution hinges on the availability of alternative energy sources and the ability of the population to pay for them.

On the other hand, pollution generated from cigarette smoking is contraindicated for a number of reasons including both its health effects on smokers as well as those forced to breathe in secondhand cigarette smoke (passive smokers). The effect of cigarette smoke on the health of children provides an additional incentive to strengthen activities aimed at breaking the smoking habit. One consequence of exposing children to cigarette smoke is that it *increases the severity of bronchial asthma*

OBJECTIVES

- Determine the percentage of children between the ages of 5 to 14 years diagnosed with asthma who are exposed to cigarette smoke.

- Determine whether or not there is a significant difference between exposure to cigarette smoke and children ages 5 through 14 with and without asthma.

METHODOLOGY

In order to meet the proposed objectives, a sample of children both with and without asthma—between the ages of 5 and 14 years —will be selected for the purpose of studying their degree of exposure to cigarette smoke.

Steps for calculating the size of the study sample are described in Part II, Support Module for Statistical Methodology.

Once the sample size has been determined, children between the ages of 5 and 14 years with asthma will be selected. In addition to the sample, a control group will be established, consisting of an equal number of children without asthma of the same age, sex and social characteristics as the study group.

The smoking habits of parents will be considered for both groups in order to calculate the percentage of children exposed to cigarette smoke that have been diagnosed with asthma as opposed to those that are asthma-free. Statistical tests will be carried out to determine whether or not children exposed to cigarette smoke have a significantly higher risk of developing asthma than those that are not.

With respect to the evaluation of smoking in the home, the following will be considered:

- The number of people living in the home of the child who smoke: whether one parent, both parents, or others;
- The average number of cigarettes smoked by each smoker per day;
- The period of time each smoker has smoked the number of cigarettes indicated.
- The number of hours that each person, including the child, spend in the home;

Other possible sources of cigarette smoke contamination the child may be exposed to (day-care centers, other places outside the home).

With respect to the evaluation of the child's disease, the following will be considered:

- The age of the child when the first symptoms appeared, and the child's age at the time asthma was diagnosed;
- The severity of the disease, evaluated in terms of the *annual frequency of asthma episodes requiring some type of home medication (nebulizing bronchodilator, or corticoid use), outpatient consultation due to aggravation of the disease, inpatient consultation, or another service of emergency, or hospitalization.* The type of treatment the child receives regularly will be recorded.

Annex 34.A includes a household survey form for each child that can be adapted for the study.

DATA PROCESSING

Data processing can be carried out using an Epi Info or similar computer program. In the event that data processing is to be carried out manually, the data summary table in Annex 34.B can be used.

One data summary table should be used for the group of children diagnosed with asthma and another for those without asthma. Moreover, if a group is to be subdivided, prepare additional data summary tables for each subgroup (for example, each of these groups can be divided on the basis of age or sex). Upon subdividing the total group, care should be taken to ensure that the resulting number is not so low that it would invalidate conclusions. Likewise, it is important to note that controls are selected in accordance with the variables into which the study groups are to be subdivided, since otherwise there will be no available group for comparison.

The data summary table in Annex 34.B includes only some of the variables feasible for study. Other variables may be added, provided that there is interest and a sufficient number of cases.

Table 34.1 includes some sample indicators or probability ratios that can be calculated on the basis of the collected information. Table II of Annex 34.C provides a model for calculating probability ratios for non-population case studies and controls. Many other indicators resulting from variables included on the household survey form can be prepared on the basis of those contained in Table 34.1.

TABLE 34.1

INDICATOR	NUMERATOR	DENOMINATOR
Probability ratio for asthma among children whose mother smokes	Number of children with asthma whose mother smokes times the number of children without asthma whose mother does not smoke	Number of children without asthma whose mother smokes times the number of children with asthma whose mother does not smoke
Probability ratio for asthma among children whose mother and father smoke	Number of children with asthma whose mother and father smoke times the number of children without asthma whose mother and father do not smoke	Number of children without asthma whose mother and father smoke times the number of children with asthma whose mother and father do not smoke
Probability ratio for asthma among children with one parent who smokes ≥ 20 cigarettes per day	Number of children with asthma and one parent who smokes ≥ 20 cigarettes per day times the number of children without asthma and no parent that smokes ≥ 20 cigarettes per day	Number of children without asthma and one parent who smokes ≥ 20 cigarettes per day times the number of children with asthma and no parent that smokes ≥ 20 cigarettes per day

ANNEX 34.A
CORRELATION BETWEEN ASTHMA AND SMOKING IN THE HOME

HOUSEHOLD SURVEY FORM

Child Identification Data:			
Child's full name: Age: [____] Sex: [____]			
On the Disease			
Asthma	Yes [__] No [__]	Classification [Mild, Moderate, Serious _____]	Appearance age [_____]
Treatment in the home	Yes [__] No [__]	(bronchodilators or corticoids)	Number of times per year: [__]
Treatment in physician's office	Yes [__] No [__]	(bronchodilators or corticoids)	Number of times per year: [__]
Treatment by guard	Yes [__] No [__]	(bronchodilators or corticoids)	Number of times per year: [__]
Hospitalizations	Yes [__] No [__]	(bronchodilators or corticoids)	Number of times per year: [__]
Current treatment:	Yes [__] No [__]	Specify:	
Remarks:			
Characteristics of Housing			
Urban [__] Rural [__] Number of rooms: [___] Indoor water service: Yes [__] No [__]			
Number of people who sleep per room: [____] Number of people who sleep with the child: [____]			
Heating system: [_____]			
Cooking system: [_____]			
Smoking in the Home			
Father smokes? Yes [__] No [__] Cigarettes per day [____] Hours spent in the home [_____]			
Child's age when father began to smoke [____]			
Mother smokes? Yes [__] No [_] Cigarettes per day [____] Hours spent in the home [_____]			
Child's age when mother began to smoke [____]			
Other [_____] Yes [__] No [__] Cigarettes per day [____] Hours spent in the home [_____]			
Child's age when he/she first came into contact with this source [____]			
Remarks:			

ANNEX 34.B
CORRELATION BETWEEN ASTHMA AND SMOKING IN THE HOME

DATA SUMMARY TABLE

Study Group: _____

VARIABLE	TOTAL	YES	NO	NO INFORMATION
Both parents smoke				
Mother smokes				
Father smokes				
Another member of the household smokes (specify relationship and living arrangement)				
No member of the household smokes				
Mother smokes more than 20 cigarettes per day				
Mother smokes between 10 and 20 cigarettes per day				
Mother smokes less than 10 cigarettes per day				
Father smokes more than 20 cigarettes per day				
Father smokes between 10 and 20 cigarettes per day				
Father smokes less than 10 cigarettes per day				
Another member of the household smokes more than 20 cigarettes per day				

ANNEX 34.B (Cont.)

VARIABLE	TOTAL	YES	NO	NO INFORMATION
Another member of the household smokes between 10 and 20 cigarettes per day				
Another member of the household smokes less than 10 cigarettes per day				
No member of the household smokes cigarettes in the home				
At least 1 of parent smokes since the child was born				
Smokers smoke at a careful distance outside the home				

Observations:

Instructions for Completing the Data Summary Table:

Prepare a data summary table for the group of cases (children with asthma) and another for the controls (children without asthma). Moreover, each group can be subdivided, for example, by age (children between the ages of 5 and 9 years, and children between the ages of 10 and 14 years).

Separate the household survey forms in as many groups as data summary tables that have been prepared.

Next, select one of the data summary tables and pick up the corresponding pile of forms. Examine the first form and locate the information sought of each aspect included in the first column of the data summary table, then place a mark in the appropriate column of the table. For example, if both parents smoke, place a mark in the **YES** column; otherwise, mark the **NO** column. If no information is available on a particular variable, mark the **NO INFORMATION** column.

Once all rows of the data summary table have been completed for the first household survey form, continue with the second form, and so on, until completing all available forms for the data summary table.

Repeat this procedure for each one of the data summary tables developed to collect data.

Once all data contained on the household survey forms have been transferred, tally the marks in each row of the data summary tables to obtain the **Total**.

Transcribe the data to tables according to the Table II model of Annex 34.C in order to facilitate calculation of indicators or probability ratios.

ANNEX 34.C
TABLES FOR CALCULATING DISEASE RISK FACTORS

TABLE I. POPULATION STUDIES

If the study concerns the entire population or a representative sample thereof, then compare the rates of asthma among children whose mothers smoke with children whose mothers do not smoke:

		ASTHMA		TOTAL
		WITH ASTHMA (+)	WITHOUT ASTHMA (+)	
MOTHER'S SMOKING	MOTHER SMOKES (+)	a	b	a + b
	MOTHER DOES NOT SMOKES (-)	c	d	c + d
TOTAL		a + c	b + d	a + b + c + d

Asthma rate (exposed) = a/a+b = $\frac{\text{Children with asthma whose mothers smoke}}{\text{Total number of children whose mothers smoke}}$

Asthma rate (unexposed) = c/c+d = $\frac{\text{Children with asthma whose mothers do not smoke}}{\text{Total number of children whose mothers do not smoke}}$

Relative Risk = $R_r = \frac{a/a+b}{c/c+d}$ = $\frac{\text{Asthma rate among exposed children}}{\text{Asthma rate among unexposed children}}$

The attributable risk is the difference between the rate of the exposed group and the rate of the unexposed group.

Attributable Risk = R_a = a/a+b - c/c/d = Asthma rate among exposed children – Asthma rate of unexposed children

These formulas help shed light on the concepts of relative risk and attributable risk. However, they cannot be used in routine case studies and controls, like Protocol 34 and the remaining protocols in Part VII of this IMCI operations research compendium because they are not population studies nor are they conducted using representative samples of the population.

TABLE II. NON-POPULATION STUDIES

		ASTHMA		
		WITH ASTHMA (+)	WITHOUT ASTHMA (+)	
MOTHER'S SMOKING	MOTHER SMOKES (+)	a	b	
	MOTHER DOES NOT SMOKE (-)	c	d	
TOTAL		a + c	b + d	a + b + c + d

In these studies of cases and controls, both the number of cases—children with asthma (a+c)—, as well as the number of controls—children without asthma (b + d)—are known. What is not known, however, is the population of children exposed to cigarette smoke (a + b) or the population of children that have not been exposed (c + d). These data cannot be used to determine the rates of risk for disease (i.e. asthma) for either the group exposed to cigarette smoke or the group that was not.

However, data on the study of cases and controls can be used to directly determine the relative risk, and to indirectly determine the attributable risk.

The relative risk in these studies corresponds to the odds or probability ratio described in Part II, Support Module for Statistical Methodology Part:

$$\text{Relative Risk in case studies and controls} = \text{Odds Ratio} = \frac{a + d}{b + c}$$

In order for this result to be correctly interpreted, the table and the corresponding calculations therein should be constructed in such a way that cases (asthma) always appear in the first column and controls (without asthma) in the second. Likewise, the first row should contain the variable associated with the appearance of cases (i.e. exposure to the cigarette smoke).

PROTOCOL 35

INFLUENCE OF THE PHYSICAL HOUSEHOLD ENVIRONMENT ON THE HEALTH OF CHILDREN UNDER 5 YEARS

INTRODUCTION

Beyond the basic purpose of housing, which is to protect human beings from the elements and provide a setting for family life, it should also ensure protection against health risks arising from the physical and the social environment. Thus, the components of the residential environment are the focus of environmental health. Because housing is part of the environment, its approach should include risk management aimed at transforming it into an agent of health for its occupants.

The structure and location of housing, as well as its services, environment, and uses, have an enormous impact on physical, mental, and social well-being. Substandard and poorly utilized dwellings do not provide their occupants with adequate defense against death, disease or accidents; in fact, they may even increase vulnerability to these risks. On the other hand, good housing not only protects occupants against the risk of disease, but also promotes physical health, economic productivity, psychological well-being, and social energy.

The adverse physical environment gives rise to environmental factors that can cause disease, such as Chagas' disease, gastrointestinal infections, as well as respiratory diseases linked to the type of materials used in flooring, walls, and ceilings, inadequate ventilation, the lack of sanitation services and protective barriers against rodents and insects. Actions geared toward improvement of the household physical environment can prevent many diseases or reduce their severity and, consequently, help reduce child morbidity and mortality.

Episodes of disease during childhood directly hinder children's development and compromise their quality of life. As a result, the environment (physical, emotional and stimulating), nutritional status and health monitoring form an inseparable triad for ensuring successful child growth and development.

Solving health problems in the short term should involve modification of family hygiene practices, as well as intervention in the physical environment where children grow and develop. This implies a need for educational efforts geared toward changing behaviors within the family space and improving the quality of life of people who live in the home with children. The space where children live needs to provide favorable conditions for healthy growth and development.

The inclusion of household environment educational components within the IMCI strategy will help foster positive changes in family behavior aimed at maintaining a physical environment with no or minimal environmental risk factors that contribute to the onset or worsening of disease.

OBJECTIVE

To identify the components of the household environment and those around the home that affect the health status of children under 5 years.

METHODOLOGY

A design consisting of *cases and controls* will be applied. Accordingly, children under 5 years will be divided into two groups for study: those that sought treatment at health services for childhood diseases (cases) and those that did not (controls).

Steps for calculating the size of the study sample are described in Part II, Support Module for Statistical Methodology. In the event that estimates exist regarding exposure to the variables under study, the size of the sample should be calculated taking into account that a type I error will be set at 5% or 0.05 and a type II error at 20% or 0.20.

For the purposes of this study, the selection of primary and hospital care services is recommended in order to obtain information on cases involving prevalent pathologies treated on an outpatient basis, as well as those requiring hospitalization due to their severity.

All cases for a given period may be selected or a sample thereof. Subsequently, a household survey will be administered on housing conditions and environs. For each case identified a control will be selected. The control will be a child who seeks treatment or is hospitalized for a cause other than prevalent pathologies, for example, children who go in for a reevaluation and follow-up visit, vaccination, or those who are hospitalized due to accidents.

Data sources for this study will include the daily patient logs, outpatient care cards, pediatric ward discharge registries (or corresponding rooms, according to hospital structure), or hospital discharge registries. In this case of the latter, data retrieval will be more complex, as it would need to be aggregated by age group and diagnosis.

The data required from the aforementioned registries includes:

- Child's age
- Address
- Diagnosis
- Reason for discharge (hospitalized children)

The aforementioned registries should contain these data; however, if they do not, a specialized instrument for collecting them should be created as maintained over the course of the study.

If different terms are used for the diagnosis of a single pathology, some reference diagnoses will be selected for coding the information. To this end, the diagnoses provided in the International

Classification of Diseases can be used, or a specific grouping system could be developed.
Upon identification of cases and controls, a household survey will be conducted. Annex 35.A provides a model household survey form that can be adapted to the realities of each survey area.

Although the survey can be administered at the health services, surveys administered in the home provide the interviewer with the opportunity to take note of housing conditions and verify them against the information given by the mother or caregiver.

DATA PROCESSING

Once all surveys are complete, the resulting data must be processed. For this purpose, an Epi Info or similar computer program can be used or data can be consolidated manually.

If data is to be processed manually, the data summary table provided in Annex 35.B. can be used. In the event a group is to be subdivided, prepare additional data summary tables for each subgroup (for example, each of these groups can be divided on the basis of age, sex, or diagnosis).

Whenever subdividing the total group, care should be taken to ensure that the resulting number is not so low that it would invalidate conclusions. Likewise, it is important to note that controls are selected in accordance with the variables into which the study groups are to be subdivided, since otherwise there will be no available group for comparison.

The Table provided in Annex 35.B includes only some of the variables feasible for study. Other variables may be added, provided that there is interest and a sufficient number of cases.

Table 35.1 includes some sample indicators or probability ratios that can be calculated on the basis of the collected information. Table II of Annex 34.C provides a model for calculating probability ratios for non-population case studies and controls. Many other indicators resulting from variables included on the household survey form can be prepared on the basis of those contained in Table 35.1.

TABLE 35.1

INDICATOR	NUMERATOR	DENOMINATOR
Probability ratio of prevalent diseases in children who live in structurally-deficient dwellings	Number of children with prevalent pathologies who live in structurally-deficient dwellings times the number of children without prevalent pathologies who live in structurally sound dwellings	Number of children without prevalent pathologies who live in structurally deficient dwellings times the number of children with prevalent pathologies who live in structurally sound dwellings
Probability ratio of diarrhea among children who live in dwellings without drinking water	Number of children with diarrhea who live in dwellings without drinking water times the number of children without diarrhea who live in dwellings with drinking water	Number of children without diarrhea who live in dwellings without drinking water times the number of children with diarrhea who live in dwellings with drinking water
Probability ratio of pathologies prevalent in children who live in dwellings with deficient household hygiene	Number of children with prevalent pathologies who live in dwellings with deficient household hygiene times the number of children without prevalent pathologies that dwell in hygienic dwellings	Number of children without prevalent pathologies who live in dwellings with deficient household hygiene times the number of children with prevalent pathologies who live in hygienic dwellings

ANNEX 35.A
ASSESSMENT OF ENVIRONMENTAL CONDITIONS OF HOUSING WHERE CHILDREN UNDER 5 YEARS RESIDE

HOUSEHOLD SURVEY FORM

1. Child identification data

   Child's name _____ Age: _____ Sex: _____

   Diagnosis _____

   Address: _____

2. Family identification data
   - 2.1 How many people live with the child? _____
   - 2.2 Parents have stable union ( ) Yes ( ) No
   - 2.3 Mother/Father only ( ) Yes ( ) No
   - 2.4 Works outside the home: ( ) Mother ( )Father
   - 2.5 Monthly family income: _____
   - 2.6 Annual family income: _____
   - 2.7 Family members' level of schooling:

Family member	Schooling						
	Illiterate	Can read and write	Primary incomplete	Primary complete	Secondary incomplete	Secondary complete	Higher ed. level
Mother							
Father							
Siblings							

Vivienda

3. ( ) Owned?
4. ( ) Rented?
5. ( ) Other: (Specify) _____

6. Building Materials
   - 6.1 ( ) Material (brick, cement, blocks)
   - 6.2 ( ) Material under construction
   - 6.3 ( ) Wood
   - 6.4 ( ) Earth
   - 6.5 ( ) Other. Specify: _____

7. ( ) Dwelling has leaks, deep cracks, irregular floors and stairs, and/or unprotected windows.
8. ( ) Electric installations are seriously precarious, include nonworking parts or insufficient lighting.
9. ( ) Dwelling exhibits a loss of structural stability and/or of supporting structures and and/or significant losses of component parts and/or stairs.

10. Tipo de vivienda
    - 10.1 ( ) Urban
    - 10.2 ( ) Rural
    - 10.3 ( ) Individual
    - 10.4 ( ) Multifamily

11. Water supply

		POTABLE WATER	WATER FOR HOUSEHOLD USE
11.1	Network water service w/ household connection	( )	( )
11.2	Network water service—outdoor—(public standpipe)	( )	( )
11.3	Network water delivered by truck	( )	( )
11.4	Tank rainwater	( )	( )
11.5	Well rainwater	( )	( )
11.6	Groundwater from piped well	( )	( )
11.7	Groundwater from criollo* well	( )	( )
11.8	Surface water (rivers, streams)	( )	( )
11.9	Water disinfected by some method. (i.e. boiling, chlorination, etc.)	( )	( )

11.10 Water storage containers equipped with covers ( ) Yes ( ) No

11.11 Does accessing water from recipients require introducing some type vessel? ( ) Yes ( ) No

12. Elimination of solid and liquid wastes
    - 12.1 ( ) Toilet connected to sewer
    - 12.2 ( ) Toilet connected to septic tank with leach field
    - 12.3 ( ) Common sanitary latrine
    - 12.4 ( ) Toilet
    - 12.5 ( ) None

13. Refuse Disposal
    13.1 ( ) Buried
    13.2 ( ) Public collection
    13.3 ( ) Burned, incinerated
    13.3 ( ) Trash dumps

14. How many windows does dwelling have? _____

15. How many doors does dwelling have? _____

16. What is the position of the door with respect to the window?
    16.1 ( ) Straight line
    16.2 ( ) Parallel
    16.3 ( ) Position irrelevant (far away)

17. What type of lighting is used in dwelling?
    17.1 ( ) Natural
    17.2 ( ) Artificial
    17.3 ( ) Mixed

18. How is the dwelling ventilated?

    18.1 ( ) Natural (breezes)
    18.2 ( ) Fans. How many fans in dwelling? _____
    18.3 ( ) Mixed (natural and fans)

19. What are moisture conditions like in the dwelling?
    19.1 ( ) No moisture
    19.2 ( ) Dwelling has a lot of moisture
    19.3 ( ) Cannot be determined

20. What is the temperature inside dwelling? If possible, check with thermometer: ( )ºC (:) time
    20.1 ( ) Very hot
    20.2 ( ) Hot
    20.3 ( ) Very cold
    20.4 ( ) Cold
    20.5 ( ) Pleasant
    20.6 ( ) Difficult to determine

Personal and Family Hygiene

21. How many people live in the dwelling?
    - 21.1 ( ) 1-3
    - 21.2 ( ) 3-6
    - 21.3 ( ) 6-10
    - 21.4 ( ) More than 10. How many? _____

22. Who lives in the dwelling?
    - 22.1 ( ) Mother and father of the child
    - 22.2 ( ) Mother, father, and siblings
    - 22.3 ( ) Mother, father, siblings, and grandparents
    - 22.4 ( ) Other individuals. Specify: _____

23. Who is responsible for care of the child?
    - 23.1 ( ) Mother
    - 23.2 ( ) Father
    - 23.3 ( ) Siblings
    - 23.4 ( ) Grandparents
    - 23.5 ( ) Other. Specify: _____

24. How many times a day do residents wash their hands?
    - 24.1 ( ) Upon awakening
    - 24.2 ( ) Before using the bathroom
    - 24.3 ( ) After using the bathroom
    - 24.4 ( ) Before breakfast
    - 24.5 ( ) After breakfast
    - 24.6 ( ) Before lunch
    - 24.7 ( ) After lunch
    - 24.8 ( ) Before a snack
    - 24.9 ( ) After a snack
    - 24.10 ( ) Before dinner
    - 24.11 ( ) After dinner
    - 24.12 ( ) Before sleeping
    - 24.13 ( ) Before changing the child's diapers

25. Frequency of adult personal hygiene practices:

Family member	Bathe Frequency: Daily ( ) Weekly ( )				Brush Teeth				Wash Hair (times per week)			
	1	2	3	4 or +	1	2	3	4 or +	2	3	4	5 or +

26. Frequency of child personal hygiene practices:

Child' age	Bathe Frequency: Daily ( ) Weekly ( )				Brush Teeth				Wash Hair (times per week)			
	1	2	3	4 or +	1	2	3	4 or +	2	3	4	5 or +

Conditions of household hygiene:

27. Number of rooms in dwelling: _____

28. Indicate rooms that exist in dwelling:

    28.1 Kitchen ( ) Yes ( ) No
        28.1.1 Inside dwelling ( )
            ( ) Has gas extraction system
            ( ) Has at least one window
        28.1.2 Outside dwelling ( )

    28.2 Bathroom ( ) Yes ( ) No
        28.2.1 Inside dwelling ( )
        28.2.2 Outside dwelling ( )

    28.3 Bedrooms ( ) Yes ( ) No
        28.3.1 How many? _____
        28.3.2 Who sleep in them? _____

    28.4 Living/family room, etc. ( ) Yes ( ) No
        28.4.1 Do people sleep in this room? ( ) Yes ( ) No If yes, who? _____

    28.5 Where do people sleep?
        28.5.1. ( ) Individual beds
        28.5.2. ( ) Mat on floor
        28.5.3. ( ) Bed that opens and closes
        28.5.4. ( ) Double bed
        28.5.5. ( ) Sofa
        28.5.6. ( ) Other. Specify: _____

29. How often is dwelling cleaned?
    29.1 Per week: _____ times
    29.2 Per day: _____ times
    29.3 Other: _____ times

30. What is used to clean floor?
    30.1 ( ) Broom
    30.2 ( ) Moist rag
    30.3 ( ) Wax
    30.4 ( ) Other. Specify: _____

31. What is used to clean furniture?

31.1 ( ) Feather Duster

31.2 ( ) Moist rag

31.3 ( ) Dry rag

31.4 Other: _____

32. Carpet/rug cleaning

32.1 How many rugs in dwelling? _____

32.2 Material from which rugs are made.

32.2.1. ( ) Acrylic

32.2.2. ( ) Cotton

32.2.3. ( ) Other: _____

32.3 How are rugs cleaned?

32.3.1. ( ) With a broom. How many times per week? _____

32.3.2. ( ) By vacuum. How many times per week)? _____

32.3.3. ( ) Dried/aired out in sun. How many times per week? _____

32.3.4. ( ) Dried/aired out in shade. How many times per week? _____

33. Curtain/drapery cleaning

33.1 How many curtains in dwelling? _____

33.2 Curtain material

33.2.1. ( ) Cotton

33.2.2. ( ) Blinds

33.2.3. ( ) Wood

33.2.4. ( ) Synthetic weave

33.3 How are the curtains cleaned?

33.3.1. ( ) With a broom. How many times per week)? _____

33.3.2. ( ) By vacuum. How many times per week)? _____

33.3.3. ( ) Washing. How many times per week? _____

33.3.4. ( ) Shaken out. How many times per week)? _____

34. Toy cleaning

34.1 ( ) Moist rag. How many times per week)? _____

34.2 ( ) Dry rag. How many times per week)? _____

34.3 ( ) Aired out in the sun. How many times per week? _____

34.4 ( ) Washing. How many times per week? _____

35. Cleaning of bedclothes

35.1 Bedclothes changed. How many times (week/day)? _____

35.2 Washing of bedclothes

35.2.1. ( ) Washed by hand

35.2.2. ( ) Washed by machine

35.2.3. ( ) Dried in the sun

35.2.4. ( ) Dried in the shade

35.2.5 Type of soap used

( ) Bar

( ) Powder

36. How are children's clothes washed (including bedclothes)?

36.1 ( ) Washed separately from the rest of the family's clothes

36.2 ( ) Washed together with family's clothes

36.3 ( ) Dried in the sun

36.4 ( ) Dried in the shade

36.5 Type of soap used

( ) Bar

( ) Powder

37. Domestic animals in the home

37.1 What type of domestic animal live in the dwelling?

37.1.1 ( ) Non

37.1.2 ( ) Dog

37.1.3 ( ) Cat

37.1.4 ( ) Hamster

37.1.5 ( ) Rabbit

37.1.6 ( ) Turtle

37.1.7 ( ) Other. Specify: _____

37.2 Where do animals live?

37.2.1 ( ) Inside dwelling

37.2.2 ( ) What animal(s) live inside dwelling? _____

37.2.3 ( ) On patio

37.2.4 ( ) What animal(s) live on patio? _____

37.2.5 ( ) Other place. Specify: _____

37.2.6 ( ) What animal(s) live there? _____

37.3 Position of animals with respect to children

37.3.1 ( ) Animal sleeps in same place as child

37.3.2 ( ) Child holds animals in his/her arms

37.3.3 ( ) Child pets animal

37.3.4 ( ) Animal sleeps in same bed as child

37.3.5 ( ) No relation between child and animal

37.3.6 ( ) Child fears animal

37.3.7 ( ) Animal is not in contact with child

37.4 What type of care do animals of the dwelling receive?

37.4.1 ( ) Vaccination

37.4.2 ( ) Baths. How often? _____

37.4.3 ( ) Veterinarian care. How often? _____

37.5 Animal has:

37.5.1 ( ) fleas?

37.5.2 ( ) ticks?

37.5.3 ( ) Other parasite? Specify: ____________________

Presence of medicine/drugs in dwelling:

38. What type of medicine/drugs and their quantities are kept in the dwelling, both in valid date and expired?

Drug	Drug Quantity (tablets, boxes, bottles)	Expired	Have Prescription	With regard to the child	
				Administered to child?	For what?
		Yes ( ) No ( )	Yes ( ) No ( )	Yes ( ) No ( )	
		Yes ( ) No ( )	Yes ( ) No ( )	Yes ( ) No ( )	
		Yes ( ) No ( )	Yes ( ) No ( )	Yes ( ) No ( )	
		Yes ( ) No ( )	Yes ( ) No ( )	Yes ( ) No ( )	
		Yes ( ) No ( )	Yes ( ) No ( )	Yes ( ) No ( )	
		Yes ( ) No ( )	Yes ( ) No ( )	Yes ( ) No ( )	
		Yes ( ) No ( )	Yes ( ) No ( )	Yes ( ) No ( )	
		Yes ( ) No ( )	Yes ( ) No ( )	Yes ( ) No ( )	
		Yes ( ) No ( )	Yes ( ) No ( )	Yes ( ) No ( )	
		Yes ( ) No ( )	Yes ( ) No ( )	Yes ( ) No ( )	

39. Exterior environment

39.1 Is dwelling located near factories? ( ) Yes ( ) No

39.1.1 If yes, what kind of factory? __________________________________

39.1.2 Distance from dwelling: _____meters

39.1.3 Does the factory dispose of waste near dwelling? ( ) Yes ( ) No

39.1.4 What type of waste?

( ) Solids
( ) Liquids
( ) Gases
( ) Other. Specify: _____________________

39.2 Is dwelling near heavily traveled roads or streets? ( ) Yes ( ) No

39.2.1 Distance from dwelling: _____ meters

39.3 Green areas (parks, plazas, etc.) nearly dwelling? ( ) Yes ( ) No

39.4 Slaughterhouses or trash dumps located near dwelling? ( ) Yes ( ) No

39.5 Is dwelling located on low ground, in swamps or muddy areas? ( ) Yes ( ) No

Interviewer's impressions

Sanitary condition of dwelling:

Hygiene of people:

Hygiene of children:

Sanitary condition of Furniture:

Sanitary condition of clothes in use:

Presence of animals:

Cleanliness of dwelling and environs:

Characteristics household environment:

Other impressions:

Interviewer identification data:

Name of interviewer _____ Date: _____

Length of interview: _____

ANNEX 35.B
IMPACT OF HOUSEHOLD PHYSICAL ENVIRONMENT CONDITIONS ON THE HEALTH OF CHILDREN UNDER 5

DATA SUMMARY TABLE

Study Group: _____

VARIABLE	TOTAL	YES	NO	NO INFORMATION
Leaks, deep cracks, irregular floors and stairs and/or windows without protection				
Open-air refuse disposal				
Excessively moisture in dwelling				
No available excreta disposal system				
No available drinking water				
Lack of family hygiene				
Lack of housing hygiene				
Factory waste near dwelling				

Instructions for completing the data summary table:

Prepare a data summary table for the group of cases (children with prevalent pathologies) and another for the controls (children without prevalent pathologies). In turn, each group can be subdivided, for example, by age of the child (children <1 year, between 1 and 4 years) or by sex.

Next, separate the household survey forms into as many groups as data summary tables that have been prepared. Select one of the data summary tables and pick up the corresponding pile of forms. Examine the first form and locate the information sought on each variable included in the first column, then place a in the appropriate column of the table. For example, if refuse is disposed in open-air garbage dumps, place a mark in the **YES** column; otherwise, mark the **NO** column. If no information is available on a particular variable, place a mark in the **NO INFORMATION** column.

Once all rows of the data summary table have been completed for the first household survey form, continue with the second, and so on, until recording all available forms in the corresponding data summary table.

Repeat this procedure for each one of the data summary tables developed for processing the data.

Once all data contained on the household survey forms have been transferred, tally the marks in each row of the data summary tables to obtain the **Total**.

Transcribe the data to tables according to model “Table II” provided in Annex 34.C. This will facilitate calculation of indicators or probability ratios.

PROTOCOL 36

CHARACTERISTICS AND SCOPE OF INDOOR AIR POLLUTANTS IN HOUSING AND THEIR EFFECT ON RESPIRATORY DISEASES IN CHILDREN

INTRODUCTION

Indoor air pollution in housing poses many challenges to health professionals. People with symptoms linked to environmental causes may have been exposed to airborne substances indoors that were once associated with outdoor environments. People spend a significant amount of time indoors, and probably more time still in the case of infants, the elderly, people with chronic diseases, and most urban residents—regardless of age. Furthermore, the concentration of a number of contaminants indoors is greater than in the outdoor environment. Concern is greatest with respect to places where people receive prolonged and continuous exposure to these contaminants, namely the home, school, and the work environment.

The respiratory system is most affected by airborne pollutants. Severe effects of pollutants can include non-respiratory signs and symptoms linked to the characteristics of these substances and factors associated with the host. Deficient air quality in closed areas can cause or contribute to the development of chronic respiratory conditions, such as asthma and hypersensitivity pneumonitis. Moreover, they can cause headaches, dry eye syndrome, nasal congestion, nausea, and fatigue.

Primary care health workers are more likely to encounter health problems caused by pollutants common to daily life, both in the home and workplace.

Establishing the etiology can be difficult since many signs and symptoms are nonspecific. These manifestations can be similar to the effects of the flu, the common cold, and allergies. Many effects can also be associated—independently or in combination—with stress, workplace pressures, and occasional discomfort.

Since some aspects of indoor air pollution have received public attention, particularly tobacco smoke in the environment, people can offer suggestions regarding the connection between respiratory or other symptoms and conditions in the home or workplace. These suggestions deserve serious consideration and follow-up, bearing in mind that effects can be mistaken.

Biological contaminants, including molds, bacteria, pollen, dust mites and animals dander produce deficient air quality in closed environments, which can lead to missed workdays and school absenteeism.

Environmental tobacco smoke (ETS) or *second hand cigarette smoke*, contains some 4,000 chemical products, including 200 known toxins—such as formaldehyde and carbon monoxide—and 43 carcinogens.

ETS contributes to the number of deaths of nonsmokers due to lung cancer and heart disease, as well as lower respiratory tract infections among children under 18 months of age.

Formaldehyde is a common chemical product found primarily in adhesive materials used in the home and workplace, including carpets, wood veneer paneling, etc. The release of formaldehyde into the air can cause cough, eye, nose, and throat irritation, skin rashes, headaches, and dizziness.

Asbestos is the name given to a group of microscopic mineral fibers. Asbestos fibers are flexible, long-lasting and do not burn. These fibers are small and lightweight enough to become airborne and inhaled, causing asbestosis (pulmonary fibrosis), lung cancer, and mesothelioma, a relatively uncommon cancer of the pleura and peritoneum. Many asbestos products are found in the home, including roofing and flooring materials, wall and pipe insulation, cement, coatings, heating equipment, and acoustic insulation. These products pose a potential health hazard in the event that materials containing asbestos are disturbed and fibers become airborne, or as they disintegrate over time.

Heating systems and domestic appliance that burn gas, wood or other fuels, can produce several combustion byproducts, the most dangerous of which are carbon monoxide (CO) and the nitrogen dioxide (NO_2). Stoves, boilers, heaters, water heaters, and dryers are examples of appliances that use combustion. Carbon monoxide is a colorless, odorless gas that hinders the distribution of oxygen in the body. According to the quantity inhaled, this gas can impede coordination, aggravate cardiovascular conditions, and produce fatigue, headache, confusion, nausea, and dizziness. Very high levels of carbon monoxide can cause death. Nitrogen dioxide is a colorless, odorless gas that irritates mucous membranes of the eyes, nose and throat. Exposure to high concentrations of nitrogen dioxide causes dyspnea. Prolonged exposure to high levels of this gas can damage respiratory tissue and lead to chronic bronchitis.

Household cleaning agents, personal care products, pesticides, paints, and solvents may contain hundreds of potentially harmful chemical products. These chemicals can cause dizziness, nausea, allergic reactions, irritation, and cancer of eye, skin, and respiratory tract.

OBJECTIVES

- To characterize the primary indoor air pollutants found in dwellings of children under 5 years.
- To determine the extent, severity, and duration of respiratory conditions in children exposed to the primary indoor air pollutants.
- To study a sample of the population in order to determine the real degree of exposure of children under 5 years to some priority contaminants.

METHODOLOGY

The design of this study provides for cases and controls lasting 3 months, during which data will be gathered on sources of contamination, exposure to contaminants, and respiratory diseases.

The cases to be studied will be taken from a sample of children under 5 years who visit the health services for acute respiratory problems. Assessment of the acute respiratory diseases component

makes it more feasible to determine the degree of these children's exposure to contaminants in the home.

Steps for calculating the size of the study sample are described in Part II, Support Module for Statistical Methodology. If an estimate of exposure to the study variables is known, the sample size should be calculated with the type I error fixed at 5% or 0.05 and the type II error at 20% or 0.20.

Inclusion criteria

- Children under 5 years whose parents give their consent for participation in the study.
- Children living in the study area.
- Children who do not have other diseases—i.e. cystic fibrosis, pulmonary tuberculosis, or with suppressed immune systems—that make them susceptible to acute respiratory diseases.

The information will be obtained from the following sources:

- Registry of children under 5 years diagnosed with respiratory diseases who received treatment and follow-up at the health service.
- Household survey on indoor air quality.
- Survey on exposure to principal contaminants.
- Measurement of some principal contaminants.

The indoor air contaminants under evaluation are related to respiratory diseases and subdivided into 4 groups:

- Environmental tobacco smoke;
- Other combustion products from boilers, kitchens, stoves, and chimneys;
- Biological contaminants, including animal hair/dander, mold, and dust mites;
- Volatile organic compounds.

Measurement of three principal contaminants can be included as a third objective: carbon monoxide, the presence of mites, and particle material.

Procedures

The health services selected for this study must have a sufficient number of consultations for respiratory diseases. Children who consult for respiratory problems will be selected, upon obtaining parental consent to participate in the study. Accordingly, the data form provided in Annex 36.A will be filled out, which includes information on patient identification and characteristics of the respiratory problem.

In the event that different names are used for the same pathology, some reference diagnoses will be selected for coding the information. To this end, the diagnoses provided in the International Classification of Diseases may be used or another system that provides for classification according to the severity of the case. Some of the terms used may include cough, nasal obstruction,

rhinopharyngitis, the common cold, influenza, sore throat, acute adenoiditis, acute otitis media, acute obstructive laryngitis, bronchial obstruction syndrome, acute bronchitis, bronchiolitis, asthma, pneumonia, and other ARI. Classification should be made according to the severity of the episode and include information on its duration and progression (i.e. medical discharge, death).

It is important to classify by age groups, since in the case of infants with ARI—primarily bronchiolitis—it is easier to determine exposure due to their young age.

The form provided in Annex 36.B can be used to collect information on exposure and primary sources of contamination. This form can be adapted to the characteristics of the study area.

In the event that the study includes measurement of the principal contaminants, home visits must be scheduled to verify the information collected previously. The methodology for monitoring the contaminants selected must be determined. Ordinarily, passive samplers (all of which are portable) or active samplers are used for this purpose. Portable samplers can be used to determine personal exposure to contaminants.

DATA PROCESSING

Data processing can be carried out using an Epi Info or similar computer program. In the event that data processing is to be carried out manually, the data summary table in Annex 36.C can be used. This table should be completed for both cases and controls, according to study sample divisions (age, diagnosis, etc.).

A stratified association analysis should be carried out to determine the degree of exposure to different contaminants and the characteristics of respiratory pathologies. Moreover, the characteristics of contaminants found in the homes of the cases and controls will be described.

The indicators are expressed as probability ratios, which can be calculated on the basis of the information collected. Table II of Annex 34.C (Protocol 34) provides a table to facilitate calculation of probability ratios for non-population case studies and controls.

Si se incluye en el estudio la medición de los contaminantes principales se debe hacer una visita domiciliaria que permitirá también la validación de la información recogida anteriormente. Se debe seleccionar la metodología para el monitoreo de los contaminantes seleccionados. En general se utilizan muestreadores pasivos (los cuales son todos portátiles) o activos, entre los que se destacan los portátiles, que sirven para estimar la exposición personal a los contaminantes.

ANNEX 36.ST
CORRELATION BETWEEN INDOOR AIR POLLUTANTS AND RESPIRATORY DISEASES IN CHILDREN

HOUSEHOLD SURVEY FORM

Form number: _____ Place and date: _____

Child Identification Data:		
Child's full name: Age: [__] Sex: [____] Date of visit /____/____/____		
Reason for visit:		
Classification/primary diagnosis:		
Other classifications/diagnoses:		
Child's address:		
Clinical picture at the time of the visit	Fever: [_____] ^{o} C	No Information [__]
Not able to drink or feed well	Yes [__] No [__]	No Information [__]
Vomits everything	Yes [__] No [__]	No Information [__]
Convulsions	Yes [__] No [__]	No Information [__]
Lethargic or unconscious	Yes [__] No [__]	No Information [__]
Chest indrawing	Yes [__] No [__]	No Information [__]
Stridor	Yes [__] No [__]	No Information [__]
Cough	Yes [__] No [__]	No Information [__]
Runny nose	Yes [__] No [__]	No Information [__]
Fast breathing	Yes [__] No [__]	No Information [__]
Ear pain	Yes [__] No [__]	No Information [__] Others:
Was child referred for hospitalization?	Yes [__] No [__]	No Information [__]
Period hospitalized [ ] days Reason for discharge:		
Remarks:		

ANNEX 36.B
CORRELATION BETWEEN INDOOR AIR POLLUTANTS AND RESPIRATORY DISEASES IN CHILDREN

DATA RECORDING FILE

Child Identification Data:

Full name:

Age: [__] Sex: [___] Date of birth: ____/____/____

Mother's marital status Stable union Yes [__] No [__] Live together: Yes [__] No [__]

Single Yes [__] No [__] Unstable union Yes [__] No [__]

Family composition (those living at the same address):

Father Yes [__] No [__] Grandmother Yes [__] No [__] Siblings Yes [__] No [__]

Mother Yes [__] No [__] Grandfather Yes [__] No [__] - Older NΥ[___]

Who cares for the child: [_____] - Younger NΥ[___]

Mother's education: Primary [__] Yrs. [__] Secondary [__] Yrs. [__] Higher ed. [__]

Father's education: Primary [__] Yrs. [__] Secondary [__] Yrs. [__] Higher ed. [__]

Caregiver's Education: Primary [__] Yrs. [__] Secondary [__] Yrs. [__] Higher ed. [__]

Characteristics of housing

Urban [_] Rural [__] Number of rooms: [_____] Indoor water service: Yes [__] No [__]

Bathroom: Yes [__] No [__] Latrine: Yes [__] No [__] Eating area: Yes [__] No [__]

Number of people who sleep by room: [_____] Number of people who sleep with the child: [_____]

Primary contaminants

1- Cigarette smoke

Are there any smokers in the family? Yes [__] No [__] Does not know [_____]

How many cigarettes smoked each day? Number [_____]

Do people smoke inside the house? Yes [__] No [__] Does not know [_____]

Do people smoke with the children are at home? Yes [__] No [__] Does not know [_____]

Did someone smoke in the house yesterday? Yes [__] No [__] Who? [_____]

How long did they smoke (total time)? [____] No [___] Does not know [_____]

2- Combustibles

What kind of stove or oven does your house have? Gas [____] Wood-burning [____] Kerosene [____]

Did you use your stove or oven yesterday? Yes [__] No [__] Does not know [_____]

Questions on stove use yesterday

Food	Number of Burners	Burner	Oven
		(total in minutes)	(total in minutes)
Breakfast			
Lunch			
Dinner			

Snack or other refreshments

Is there a place in your house exclusively for cooking? Yes [__] No [__] Does not know [_____]

Was the child in the kitchen or in an area nearby when

you used the stove? Yes [__] No [__] Does not know [_____]

If yes, bout how much time in total? [_____]

Do appliances that need ventilation include outtake pipes to eliminate air outside?	Yes [__]	No [__]	Does not know [_____]
Do members of the household experience flu-like symptoms when heating is used?	Yes [__]	No [__]	Does not know [_____]
Do members of the household complain about other symptoms in this period (nausea, watery eyes, cough, headache)?	Yes [__]	No [__]	Does not know [_____]
Did you use the heater yesterday to heat your house?	Yes [__]	No [__]	Does not know [_____]
If yes, about how much time in total? [_____]			
If dwelling has wood-burning stove			
Did you use a wood-burning stove yesterday?	Yes [__]	No [__]	Does not know [_____]
If yes, about how much time in total? [_____]			
If dwelling uses heating oil or kerosene for heating			
Did you use a kerosene heater in your house?	Yes [__]	No [__]	Does not know [_____]
If yes, about how much time in total? [_____]			
Is the odor felt when the heating is in use?	Yes [__]	No [__]	Does not know [_____]
Do you burn charcoal inside the house, either in a grill or chimney?	Yes [__]	No [__]	Does not know [_____]
3- Biological contaminants			
Is the house very damp?	Yes [__]	No [__]	Does not know [_____]
Do you use humidifiers or other water vaporizer systems in the house?	Yes [__]	No [__]	Does not know [_____]
Has the house flooded or had leaks?	Yes [__]	No [__]	Does not know [_____]
Have you seen any mold/mildew growing in the house?	Yes [__]	No [__]	Does not know [_____]
Does the house have problems with cockroaches or rodents?	Yes [__]	No [__]	Does not know [_____]
Does the house have adequate ventilation?	Yes [__]	No [__]	Does not know [_____]
Does the house have a stale/musty smell?	Yes [__]	No [__]	Does not know [_____]
Do any pets stay indoors? Yes [__] How many? [_____]		No [__]	Does not know [_____]
Does the child play with the pets (or have contact with them)?	Yes [__]	No [__]	Does not know [_____]
If yes, about how much time in total? [_____]			
Did you run an air conditioning unit or fan to cool the house yesterday? If yes, about how much time in total? [_____]	Yes [__]	No [__]	Does not know [_____]
4- Volatile compounds			
Does the individual reside in a mobile home or in a new conventional house with a significant number of pressed wood products?	Yes [__]	No [__]	Does not know [_____]
Is work done at home that includes the use of graphic materials, photography supplies, or handcrafts?	Yes [__]	No [__]	Does not know [_____]
Are chemical cleansers used extensively in the home, school or workplace?	Yes [__]	No [__]	Does not know [_____]
Have pesticides, paints or solvents recently been used in the home?	Yes [__]	No [__]	Does not know [_____]

ANNEX 36.C
CORRELATION BETWEEN INDOOR AIR POLLUTANTS AND RESPIRATORY DISEASES IN CHILDREN

DATA SUMMARY TABLE

Study Group: _____

VARIABLE	TOTAL	YES	NO	NO INFORMATION
Presence of wood-burning stove				
Child continually exposed to stove during use				
Child continually exposed to stove during use for more than 1 hour per day				
Father smokes				
Heating with coal or wood				
Dwelling has specific cooking area				

Observations:

PROTOCOL 37

SIGNIFICANCE OF FOOD CONTAMINATION AS A CAUSE OF DIARRHEAL DISEASE IN CHILDREN UNDER 5

INTRODUCTION

The World Health Organization estimates that a high percentage of cases of diarrhea and deaths resulting in children under 5 years are due to consumption of contaminated food. In some populations, cultural conceptions regarding ways to prepare, store, and consume food favor contamination with pathogenic germs that cause diarrhea and endanger the life of the child.

There are many factors that favor the multiplication and persistence of microorganisms in food. These include: the quality of the raw material; intermixing between raw products and those ready for consumption; insufficient cooking; food kept at inadequate temperatures; prolonged time between preparation and consumption; lack of hygiene in food preparation; and the presence of vectors.

Due to their low cost and high effectiveness, health education measures are especially significant in terms of the prevention of foodborne diseases. As a result, the knowledge of factors and conditions that give rise to food contamination is of great importance for the implementation of educational measures.

OBJECTIVE

To identify the characteristics and factors in food handling most frequently associated with cases of diarrheal disease in children under 5 years.

METHODOLOGY

A design consisting of *cases and controls* will be applied. Accordingly, children will be divided into two groups for study: those that sought treatment at health services for diarrheal diseases (cases) and those that sought treatment for a different pathology or health problem (controls).

For this purpose, it is recommended that primary care and hospital services be selected in order to facilitate information on both diarrhea cases treated on an outpatient basis, as well as those requiring hospitalization due to their severity.

Steps for calculating the size of the study sample are described in Part II, Support Module for Statistical Methodology. In the event that estimates exist regarding exposure to the variables under study, the size of the sample should be calculated taking into account that a type I error will be set at 5% or 0.05 and a type II error at 20% or 0.20.

All cases during a specific period can be selected or, alternatively, a sampling of these cases. Subsequently, a household survey on food handling habits will be conducted. For each case identified a control will be selected, consisting of a child who visits the health service or who is hos-

pitalized for something other than diarrhea. A survey similar to that administered to cases will also be carried out for controls.

Data sources will include daily patient logs, outpatient care cards, pediatric ward discharge registries (or of the corresponding rooms according to hospital structure) or hospital discharge registries. In this case, data collection will be more complex because it will take age group and diagnosis into account.

Information obtained from the registries should include:

- Age of the child;
- Address;
- Diagnosis;
- Reason for discharge (hospitalized children).

The study assumes that registries include this information. In the event they do not, a special instrument to collect these data needs to be created for the duration of the study. Once the cases and controls have been identified, a household survey will be conducted. Annex 37.A provides a model form for home visits that can be adapted to each survey area.

The controls should be the same age and live in the same area as the cases in order to minimize characteristics other than food handling. The variables studied will include food handling characteristics, as well as personal, household, and environmental hygiene habits.

DATA PROCESSING

Once the home visits to evaluate factors related to diarrhea have been completed, the resulting data are to be processed either manually or using an EPI Info or similar computer program.

The data summary table provided in Annex 37.B. can be used if data are to be processed manually. One data summary table should be prepared for the group of cases and another for the control group. If both groups are to be further subdivided (for example, by age or sex), then additional data summary tables should be prepared. Whenever subdividing the total group, care should be taken to ensure that the resulting number is not so low as to invalidate conclusions. Likewise, it is important to note that controls are selected in accordance with the variables into which the study groups are to be subdivided, since otherwise there will be no available group for comparison.

The data summary table provided in Annex 37.B includes only some of the variables feasible for study. Other variables may be added, provided that there is interest and a sufficient number of cases.

Table 37.1 includes some sample indicators or probability ratios that can be calculated on the basis of the collected information. Table II of Annex 34.C (Protocol 34) provides a model for calculating probability ratios for non-population case studies and controls. Many other indicators resulting from variables included on the household survey form can be prepared on the basis of those contained in Table 37.1.

TABLE 37.1

INDICATOR	NUMERATOR	DENOMINATOR
Probability ratio for diarrhea among children who consume food preserved at inadequate temperatures	Number of children with diarrhea who consume food preserved at inadequate temperatures times the number of children without diarrhea who consume food preserved at adequate temperatures	Number of children without diarrhea who consume food preserved at inadequate temperatures times the number of children with diarrhea who consume food preserved at adequate temperatures
Probability ratio for diarrhea among children who consume food prepared in inadequate places	Number of children with diarrhea who consume food prepared in inadequate places times the number of children without diarrhea who consume food prepared in adequate places	Number of children without diarrhea who consume food prepared in inadequate places times the number of children with diarrhea who consume food prepared in adequate places
Probability ratio for diarrhea among children in dwellings with no drinking water	Number of children with diarrhea in dwellings with no drinking water times the number of children without diarrhea in dwellings served with drinking water	Number of children without diarrhea in dwellings with no drinking water times the number of children with diarrhea in dwellings served with drinking water

ANNEX 37.A
CORRELATION BETWEEN FOOD CONTAMINATION AND DIARRHEAL DISEASES IN CHILDREN UNDER 5

HOUSEHOLD SURVEY FORM

Child Identification Data:

Child's full name:

Age: [__] Sex: [_] Date of birth: ___/___/___ Date of interview: ___/___/___

Mother's full name:

Child's address:

Child's disease (cases only)

Type of diarrhea: Watery [__] Blood in stool [__] Duration of diarrhea: [__] days

Other symptoms: Vomiting [__] Cramps [__] Others:_____

Classification of episode

Without dehydration [__] With dehydration [__] Serious dehydration [__]

Family composition (those living at the same address):

Father Yes [__] No [__] Grandmother Yes [__] No [__] Children age 0-4 yrs. NΥ[____]

Mother Yes [__] No [__] Grandfather Yes [__] No [__] Other members of household NΥ[___]

Mother's education: Primary [__] Yrs. [__] Secondary [__] Yrs. [__] Higher ed. [__]

Father's education: Primary [__] Yrs. [__] Secondary [__] Yrs. [__] Higher ed. [__]

Characteristics of housing

Urban [__] Rural [__] Number of rooms: [__]

Number of people who sleep per room: [____]

Water supply:

Network [__] Well [_] Other:

Treatment Yes [__] No [__] Method:

Periodic control Yes [__] No [__] Method:

Indoor water service: Yes [__] No [__] Place for hand washing Yes [__] No [__]

How far is the water source?

At any time of the day is water lacking? Yes [__] No [__]

If yes, when? How long?

Do you separate drinking water from water used to cook with? Yes [__] No [__]

Type of container	Cooking water	Drinking water	Storage place	Cooking water	Drinking water
Plastic			Interior:		
Bottle			- Covered		
Stone/ceramic			- Uncovered		
Tin/barrel			Exterior:		
			- Covered		
			- Uncovered		

Food

What foods were consumed yesterday?

Under 1 year	1-4 years	5-14 years	Adults

What foods were consumed during the last 7 days?

Food	Cooked	Raw	How many days?	Who ate them?	Observations
Green vegetables					
Tuber vegetables					
Fruits					
Corn					
Other grains					
Eggs					
Meat					
Fish					
Bread					
Milk					
Others					

What do you do with food leftovers?			
Throw them away? Which?	Yes [__] No [__]		
Keep them until they are eaten? Which?	Yes [__] No [__]		
Use them to prepare other meals? Which?	Yes [__] No [__]		
When are meals prepared?			
Immediately before eating them? Which?	Yes [__] No [__]		
Early in the morning for the whole day? Which?	Yes [__] No [__]		
Are some meals prepared days before they are consumed? Yes [__] No [__] Which?			
Where are raw foods kept up to the time they are prepared or eaten? Refrigerated Yes [__] No [__] Room temperature Yes [__] No [__] Others:			
Where are prepared foods up to the time they are eaten? Refrigerated Yes [__] No [__] Room temperature Yes [__] No [__] Others:			
Are raw and prepared foods stored in the same place?	Yes [__] No [__]		
Are vegetables washed before being eaten?	Yes [_] No [_]		
Is the previously prepared food reheated before their consumption? Yes [__] No [__] Which?			
Food preparation (hygiene observations of materials used)			
	Not observed	In good condition	Inadequate
Pots casserole dishes, etc.			
Utensils used for food preparation			
Bowls, plates, glasses, utensils, etc.			
General condition of food preparation area			
Excreta:			
Bath [__] Latrine [__] Other:			
Sewer system: [__] Septic tank: [_] Other:			
Personal and household hygiene practices			
	Hand Washing		Wears shoes
Person	Before eating	After using bathroom	
	Yes [_] No [_]	Yes [_] No [_]	Yes [_] No [_]
	Yes [_] No [_]	Yes [_] No [_]	Yes [_] No [_]
	Yes [_] No [_]	Yes [_] No [_]	Yes [_] No [_]
	Yes [_] No [_]	Yes [_] No [_]	Yes [_] No [_]
	Yes [_] No [_]	Yes [_] No [_]	Yes [_] No [_]
	Yes [_] No [_]	Yes [_] No [_]	Yes [_] No [_]
	Yes [_] No [_]	Yes [_] No [_]	Yes [_] No [_]
Adequate kitchen hygiene	Yes [_] No [_]	Clean hands	Yes [_] No [_]

Has the family experienced other cases of diarrhea during the past 30 days?

Name	Sex	Age	Symptoms	Who gave care?	Treatment

Remarks:

ANNEX 37.B
CORRELATION BETWEEN FOOD CONTAMINATION AND DIARRHEAL DISEASES IN CHILDREN UNDER 5 YEARS

DATA SUMMARY TABLE

Study Group: _____

VARIABLE	TOTAL	YES	NO	NO INFORMATION
Food preserved at inadequate temperatures				
Food prepared in advance				
Food leftovers used to prepare other meals				
Use of unhygienic containers, utensils and surfaces				
No available drinking water				
No available sanitary disposal of excreta				
Lack hand-washing hygiene before preparing food				

Observations:

Instructions for Completing Data Summary Tables:

Prepare a data summary table for the group of cases (children with diarrhea) and another for the control group (children without diarrhea). Likewise, each group can be subdivided, for example, by age (children <1 year, from 1 to 4 years), or by sex.

Separate the household survey forms into as many groups as data summary tables that have been prepared.

Next, select one of the data summary tables corresponding pile of household survey forms. Examine the first form and locate the information sought for each aspect included in the first column of the data summary table, then place a mark in the appropriate column of the table. For example, if the dwelling is located at a distance of an hour or less to the health service where the child was attended prior to death, place a mark in the **YES** column; otherwise, mark the **NO** column. If no information is available on a particular aspect, place a mark in the **NO INFORMATION** column.

Once all rows of the data summary table have been completed for the first household survey form, continue with the second form, and so on, until completing all available forms for the data summary table.

Repeat this procedure for each one of the data summary tables developed to collect data.

Once all data contained on the household survey forms have been transferred, tally the marks in each row of the data summary tables to obtain the **Total**.

Transcribe the data to tables according to Table II of Annex 34.C, in order to facilitate calculation of indicators or probability ratios.

PROTOCOL 38

FACTORS RELATED TO UNSUCESSFUL TREATMENT OF INTESTINAL PARASITIC DISEASES IN CHILDREN

INTRODUCTION

Intestinal parasitic diseases are among the diseases that most often affect children, especially after age 2 years. Consultation at health services for intestinal parasitic diseases is uncommon, since parents do not easily recognize their signs and symptoms. Given the high incidence of these diseases among children, and the rapid rate of re-infection after treatment, in many places, intestinal parasitic diseases are considered habitual and are not seen as a cause for concern by parents and the family.

However, intestinal parasitic diseases are an associated cause of malnutrition, anemia, stunted growth, and learning disorders among school-age children. Furthermore, depending on the type of parasite, they can cause specific problems, such as skin disorders, respiratory problems, poor absorption, intestinal obstruction, etc.

The effort to control intestinal parasitic diseases is geared toward treating the disease in each affected individual and reducing the number of sources of infection in the community that can perpetuate the cycle of each parasite. In terms of this effort, reducing the number of infected children takes on great importance, because children eliminate the greatest number of parasite eggs and thus, reinitiate the cycle of infection.

Massive periodic treatment with anti-parasite drugs can bring about a drastic reduction in the number of parasite-infected people, especially among children between the ages of 2 and 14 years, and can keep them free from infection for a prolonged period. Reducing the number of parasite eggs in the community helps to reduce the probability of re-infection once periodic treatment with anti-parasite drugs is suspended. If simultaneous efforts are conducted toward modifying lifestyle and hygiene habits that are closely linked to higher risk for intestinal parasite infection, this will initiate the process for controlling the problem in the future.

The analysis of factors associated with unsuccessful treatment of intestinal parasitic diseases in children takes on a great importance. Its identification would make it possible to gear efforts toward more efficient control of the problem and thus, help diminish the percentage of unsuccessfully treated cases with respect to the total.

OBJECTIVE

To identify the most commonly occurring characteristics and factors linked to unsuccessfully treated cases of intestinal parasitic disease.

METHODOLOGY

Some characteristics will be studied of children treated for intestinal parasites between the ages of 2 and 14 yrs. A *cases and controls* design will be applied. Accordingly, children will be divided into two groups for study: those that were successfully treated for parasites (controls) and those whose treatment was unsuccessful (controls). In order to establish success of the treatment, a parasitological examination will be administered at the end of the first and third months. Treatment will be considered unsuccessful when a child tests positive for parasites in the exam given at the end of three months (the one-month exam will be used to evaluate the direct effectiveness of the anti-parasite drug).

The study variables, both in children with successful and unsuccessful treatment, will include the type of treatment administered, coverage reached with the anti-parasite drug treatment among children aged 2 to 14 yrs. of the family group, and modification of personal, household, and environmental hygiene practices. In all cases the family's perception of the problem will also be investigated, since, to a great extent, this determines the motivation for modifying life habits that increase the risk of becoming infected.

Target Population

The study can be conducted at health services or in a specific area.

- If health services are selected, parasitological examinations should be given to children between the ages of 2 and 14 yrs. that visit the service. All children that test positive should be treated, as well as children between the ages of 2 and 14 years living with those infected. A new examination should be carried out at the end of one and three months from the time treatment is administered. Based on the results of the latter examination, two groups of children will be formed: those for whom the treatment was successful and those whose treatment was not. For both groups, family characteristics and the modification of personal, domestic, and environmental hygiene practices should be studied. Because the treatment consists of a single dose of anti-parasite medication, it should always be administered under health worker supervision.

- The study can also be conducted in a specific geographical area. In this case, parasitological examinations are given to all children living in the study area between the ages of 2 and 14 yrs. Accordingly, children who test positive for parasites will receive treatment and be tested at the end of one month and then again after three months. Based on these last studies, groups of cases and controls can be formed in order to study the characteristics specific to each.

The choice of methodology will depend on the possibilities. The first case requires fewer of resources because the cases and controls will be selected based on consultations at the health services. However, this procedure will take longer in order to reach a sufficient number of cases of parasitic intestinal disease. If the population of a specific area is selected, cases will be identified simultaneously upon completion of the parasitological study, but this will require the examination of a larger number of children over a short period, which is why it is more expensive.

In both cases, once the two groups of children have been formed on the basis of results of the parasitological examination at the end of 3 months time, home visits should be carried out in order to obtain the necessary information on personal, domestic, and environmental hygiene practices. Annex 38.A provides a data recording form for home visits that can be adapted for each survey area.

Steps for calculating the size of the study sample are described in Part II, Support Module for Statistical Methodology. If an estimate exists regarding exposure to the variables studied, the sample should be calculated taking into account that the error of type I will be set in 5% or 0.05 and the error of type II will be set at 20% or 0.20.

DATA PROCESSING

Once the home visits to evaluate factors associated with unsuccessful treatment have been completed, the resulting data are to be processed using a computer program (Epi Info or similar) or some indicators can be consolidated manually.

The data summary table provided in Annex 38.B. can be used if data are to be processed manually. One data summary table should be prepared for the group of children for which the treatment was unsuccessful (cases) and another for children whose treatment was successful (controls). If both groups are to be further subdivided (for example, by age or sex), then additional data summary tables should be prepared. Whenever subdividing the total group, care should be taken to ensure that the resulting number is not so low as to invalidate conclusions. Likewise, it is important to note that controls are selected in accordance with the variables into which the study groups are to be subdivided, since otherwise there will be no available group for comparison.

The data summary table provided in Annex 38.B includes only some of the variables that are feasible for study. Other variables may be added, provided that there is interest and a sufficient number of cases.

Table 38.1 includes some sample indicators or probability ratios that can be calculated on the basis of the collected information. Table II of Annex 34.C (Protocol 34) provides a model for calculating probability ratios for non-population case studies and controls. Many other indicators resulting from variables included on the household survey form can be prepared on the basis of those contained in Table 38.1.

TABLE 38.1

INDICATOR	NUMERATOR	DENOMINATOR
Probability ratio for unsuccessful treatment in children who dwell in housing without drinking water	Number of children treated unsuccessfully who live in housing without drinking water times the number of children treated successfully who live in housing with drinking water	Number of children treated successfully who live in housing without drinking water times the number of children treated unsuccessfully who live in housing with drinking water
Probability ratio for unsuccessful treatment in children whose mothers do not consider intestinal parasitic diseases to be important	Number of children treated unsuccessfully whose mothers do not consider intestinal parasitic diseases to be important times the number of children treated successfully whose mothers consider intestinal parasitic diseases to be important	Number of children treated successfully whose mothers do not consider intestinal parasitic diseases to be important times the number of children treated unsuccessfully whose mothers consider intestinal parasitic diseases to be important

ANNEX 38.ST
FACTORS RELATED TO UNSUCESSFUL TREATMENT OF INTESTINAL PARASITIC DISEASES IN CHILDREN AGES 2 THROUGH 14

HOUSEHOLD SURVEY FORM

Child Identification Data:

Child's full name:

Age: [__] Sex: [_] Date of birth: ___/___/___/ Date of interview: ____/____/____/

Mother's full name:

Child's address:

On the child's parasitic disease:

Date of initial visit: ____/____/____/ Parasites found: _____

Date of the treatment: ___/___/____/ Parasite examination at end of month 1: _____

Treatment: _____ Parasite examination at the end of month 3: _____

Family Composition (those living at the same address):

Father Yes [__] No [__] Grandmother Yes [__] No [__] Children 2-14 yrs. NY[__]

Mother Yes [__] No [__] Grandfather Yes [__] No [__] Other members of household NY[__]

Mother's education: Primary [__] Yrs. [__] Secondary [__] Yrs. [__] Higher ed. [__]

Father's education: Primary [__] Yrs. [__] Secondary [__] Yrs. [__] Higher ed. [__]

Characteristics of housing

Urban [__] Rural [__] Number of rooms: [__] Number of people who sleep per room: [__]

Water supply:

Network [__] Well [__] Other: [_____]

Treatment Yes [__] No [__] Method: [_____]

Periodic Control Yes [__] No [__] Method: [_____]

Indoor water service: Yes [__] No [__] Area for hand washing Yes [__] No [__]

Excreta: Bathroom [__] Latrine [__] Other: [_____]

Sewer hookup: [__] Cesspool: [__] Other: [_____]

Personal and household hygiene practices

	Hand Washing		Wears shoes
Person	Before eating	After using bathroom	
	Yes [_] No [_]	Yes [_] No [_]	Yes [_] No [_]
	Yes [_] No [_]	Yes [_] No [_]	Yes [_] No [_]
	Yes [_] No [_]	Yes [_] No [_]	Yes [_] No [_]
	Yes [_] No [_]	Yes [_] No [_]	Yes [_] No [_]
	Yes [_] No [_]	Yes [_] No [_]	Yes [_] No [_]
	Yes [_] No [_]	Yes [_] No [_]	Yes [_] No [_]
	Yes [_] No [_]	Yes [_] No [_]	Yes [_] No [_]
Adequate kitchen hygiene	Yes [_] No [_]	Clean hands	Yes [_] No [_]

Anti-parasite treatment

Carried out the treatment of child according to instructions? Yes [__] No [__] And the rest? Yes [__] No [__]

Child	Age	Child underwent treatment?	Causes
		Yes [__] No [__]	
		Yes [__] No [__]	
		Yes [__] No [__]	
		Yes [__] No [__]	
		Yes [__] No [__]	
		Yes [__] No [__]	
		Yes [__] No [__]	
		Yes [__] No [__]	

Opinion on Intestinal Parasitic Diseases:

Do you know what parasites are?

Do you believe parasites are a problem? Yes [__] No [__]

Why or why not?

Do you believe it is necessary to treat children for intestinal parasitic diseases? Yes [__] No [__]

Why or why not?

Observations:

ANNEX 38.B
FACTORS RELATED TO UNSUCESSFUL TREATMENT OF
INTESTINAL PARASITIC DISEASES IN CHILDREN AGES 2 THROUGH 14
DATA SUMMARY TABLE

Study Group: _____

VARIABLE	TOTAL	YES	NO	NO INFORMATION
Child habitually walks barefoot				
Child eats without having washed hands				
Child leaves bathroom without washing hands				
Available water is not potable				
Excreta disposal is inadequate				
Mothers believe that intestinal parasitic diseases have little or no importance				

Observations:

Instructions for Completing the Data Summary Table:

Prepare a data summary table for the group of cases (children with unsuccessful parasite treatment) and another for the control group (children with successful parasite treatment). Likewise, each group can be subdivided, for example, by age (children ages 2 to 4 yrs., 5 to 9 yrs., and 10 to 14 yrs.), or by sex.

Separate the household survey forms into as many groups as data summary tables that have been prepared.

Next, select one of the data summary tables corresponding pile of household survey forms. Examine the first form and locate the information sought for each aspect included in the first column of the data summary table, then place a mark in the appropriate column of the table. For example, if one or more of the children ages 2 to 14 years that live in the household walk barefoot, place a mark in the **YES** column; otherwise, mark the **No** column. If no information is available on a particular variable, place a mark in the **NO INFORMATION** column.

Once all rows of the data summary table have been completed for the first household survey form, continue with the second form, and so on, until completing all available forms for the data summary table.

Once all data contained on the household survey forms have been transferred, tally the marks in each row of the data summary tables to obtain the **Total**.

Transcribe the data to tables according to the model provided in Table II model of Annex 34.C, in order to facilitate calculation of indicators or probability ratios.

PROTOCOL 39

PRENATAL CARE CHARACTERISTICS OF MOTHERS OF CHILDREN UNDER 5 ASSOCIATED WITH A GREATER INCIDENCE AND SEVERITY OF CHILDHOOD ILLNESS

INTRODUCTION

The health status of children under 5 years basically depends on care that parents provide in the home. Feeding children, protecting them from external factors (climate, accidents), as well as observing any unusual behavioral patterns, are essential activities for the prevention and early detection of disease, and to ensure the most adequate treatment. Periodic follow-up of the child by health workers and specific preventive measures, such as having the child vaccinated, are also measures included within the care of the child in the home, which are of critical importance in terms of reducing the occurrence and severity of childhood diseases.

In view of the fact a child is essentially a dependent being, adults will always have to make decisions concerning the child's feeding, clothing, and general state of health. These adults will have to interpret whether the child is *healthy* or *sick* by observing its behavior; and will also decide the point at which the child's *disease* reaches a sufficiently high level of concern that warrants seeking care outside the home. Accordingly, it is important to recognize inadequate patterns of child disease prevention and health protection in order to identify families whose young children are most at risk.

Whether or not prenatal care was given, or the characteristics of prenatal care in terms of how early it was given or the regularity with which it was given, can prove useful in identifying at-risk families. The lack of prenatal care can be associated to a somewhat more nonchalant attitude toward child disease prevention and health protection, which can adversely affect care the child receives. The existence of this association could be reflected in a greater incidence of preventable diseases, or greater severity of episodes of disease, due to inadequate care of the child in the home, the lack of disease prevention and health protection measures, as well as the delay in recognizing early signs of disease that warrant consultation.

OBJECTIVE

To describe the prenatal care characteristics of mothers of children under 5 years, which may be associated with a greater incidence and severity of childhood illnesses included in the IMCI strategy.

METHODOLOGY

Some of the characteristics of prenatal care will be studied with respect to mothers of children under 5 years, in order to associate them with the number, frequency, and severity of episodes of diseases suffered by these children, which are included within the IMCI strategy. To this end, two groups will be selected:

- Mothers whose children under 5 years have had serious episodes of diseases included within the IMCI strategy (classifications such as *very serious disease*, *severe pneumonia*, *diarrhea with severe dehydration*, *very serious febrile disease*, *severe malnutrition*, or *mastoiditis*), that have had episodes of vaccine-preventable diseases like measles or whooping cough, or a high number of episodes of preventable diseases that are preventable by others means (i.e. feeding, personal, and household hygiene preventing diarrhea).

- Mothers whose children under 5 years that do not meet any of the previous conditions will constitute *controls.*

The characteristics of prenatal care for the most recent pregnancy (previous or current) will be investigated for both groups. These will include the mother's record of attendance for prenatal care visits at health services, how early on in the pregnancy prenatal care was received, the regularity of prenatal care visits, as well as several life, hygiene, and feeding practices during pregnancy.

Some indicators will be compared in both groups in order to determine whether or not there are any significant differences.

Target Population

The target population can be selected from one or more health services. At these health services, identify children under 5 years who have been classified by health workers with: *very serious disease, severe pneumonia, diarrhea with severe dehydration, mastoiditis, very serious febrile disease, severe malnutrition*, or another serious classification included within the IMCI strategy; in addition to children with *measles* or *whooping cough*, both vaccine-preventable diseases.

In the event that children with a high incidence of certain diseases that are preventable by means other than vaccination are to be included in the study—i.e. children with 3 or more episodes of diarrhea over a 1-year period—a registry system must be in place to facilitate their identification. Examples of these kinds of registries include clinical histories or outpatient care cards, which are prepared for each individual. If no such registries exist, parents can be consulted for information regarding diseases affecting the child during the last year, although this information will be less reliable.

The steps for calculating the size of the study sample are described in the "Statistical Methodology Support Module," (Section II) on association research. In the event that estimates exist regarding exposure to the variables under study, the size of the sample should be calculated taking into account that a type I error will be set at 5% or 0.05 and a type II error at 20% or 0.20.

The procedure for selecting children is as follows:

- Review daily patient logs of the selected health services until identifying a consultation that resulted in one of the aforementioned diagnoses.

- Immediately determine whether or not the child diagnosed with this classification is under age 5 years.

- If the child is under age 5, then include in the study. Prepare a survey form for the child according to the model provided in Annex 39.A., in order to obtain information on the mother's prenatal care.

- Among children that visited the health services that same day, select one of the same sex and approximate age with a different diagnosis (one that does not include any of the aforementioned diseases).

- Likewise, prepare a survey form for this child to obtain information on the mother's prenatal care.

The foregoing procedure can be carried out both for past consultations (reviewing patient logs of previous days or months), or future consultations. In terms of past consultations, it will not be difficult to quickly obtain a sufficient number of cases and controls in order to carry out the interviews and finalize the data collection. However, some difficulties may be encountered, such as the ability to locate the families after a prolonged period of time. Moreover, in these cases home visits should always be carried out in order to obtain prenatal care information.

In the event that future consultations are to be used for this information, the process will take longer in order to obtain a sufficient number of cases and controls. However, it will be easier to locate the families and many of the interviews can be conducted on-site at the health services, whether at the time of the visit or during a reevaluation and follow-up visit, thus considerably reducing the need for home visits.

Data collection and processing

Information regarding the child's illness should be obtained on cases and controls alike, as well as on the prenatal care characteristics of each child's mother. Because the latter information will be obtained through direct interview with the mother, all information on the child and mother can be systematized in one registry.

Annex 39.A provides a model household survey form. The first part contains information on the child's episode of disease, while the second part is used for information on the mother's prenatal care characteristics. This survey form can be adapted to the needs of each survey area.

Once the information has been collected, it should then be processed using an Epi Info or similar computer program. In the event that data processing is to be carried out manually, the data summary table provided in Annex 39.B can be used.

Table 39.1 includes some sample indicators or probability ratios that can be calculated on the basis of the collected information. Table II of Annex 34.C (Protocol 34) provides a model table for calculating probability ratios for non-population case studies and controls. Many other indicators resulting from variables included on the household survey form can be prepared on the basis of those contained in Table 39.1.

TABLE 39.1

INDICATOR	NUMERATOR	DENOMINATOR
Probability ratio of very serious disease in children whose mothers did not have any prenatal care during their last pregnancy	Number of children with very serious disease whose mothers did not have any prenatal care during their last pregnancy times the number of children without very serious disease whose mothers had regular prenatal care during their last pregnancy	Number of children without very serious disease whose mothers did not have any prenatal care during their last pregnancy times the number of children with very serious disease whose mothers had regular prenatal care during their last pregnancy
Probability ratio of diarrhea with serious dehydration in children whose mothers only had 2 or fewer prenatal care visits during their last pregnancy	Number of children with diarrhea with severe dehydration whose mothers only had 2 or fewer prenatal care visits during their last pregnancy times the number of children without diarrhea with severe dehydration whose mothers had regular prenatal care during their last pregnancy	Number of children without diarrhea with serious dehydration whose mothers only had 2 or fewer prenatal care visits during their last pregnancy time the number of children with diarrhea with serious dehydration whose mothers had regular prenatal care during their last pregnancy
Probability ratio of severe malnutrition in children ages 1 to 4 yrs. whose mothers smoked during their last pregnancy	Number of children ages 1 to 4 yrs. with severe malnutrition whose mothers smoked during their last pregnancy times the number of children without severe malnutrition whose mothers did not smoke during their last pregnancy	Number of children ages 1 to 4 yrs. without severe malnutrition whose mothers smoked during their last pregnancy times the number of children with severe malnutrition whose mothers did not smoke during their last pregnancy

ANNEX 39.A
PRENATAL CARE CHARACTERISTICS OF MOTHERS OF CHILDREN UNDER 5 YEARS ASSOCIATED WITH A GREATER INCIDENCE AND SEVERITY OF CHILDHOOD ILLNESS

HOUSEHOLD SURVEY FORM

Child's Identification Data:
Child's full name:
Age: [__] Sex: [__] Date of consultation/hospitalization: ____/____/____/
Classification/diagnosis:
Child's address:
Mother's Identification Data:
Mother's full name:
Age: [__] Number of living children [__] Number of dead children [__] Stable union: Yes [__] No [__]
Education: Primary: Yes [__] No [__] Yrs. [__] Secondary: Yes [__] No [__] Yrs. [__] Higher ed.: Yes [_] No [_]
Mother works outside the home: Yes [__] No [__] Number of hours: [___]
Prenatal Care during Last Pregnancy:
Date of delivery: ____/____/____/ Institutional: Yes [__] No [__] Number of previous deliveries: [____]
With prenatal care: Yes [__] No [__] Number of prenatal care visits: [___]
Adequate number of visits: Yes [__] No [__]
First prenatal care visit before fifth month of pregnancy: Yes [__] No [__] Early control: Yes [__] No [__]
Mother smokes: Yes [__] No [__] It smoked during the pregnancy: Yes [__] No [__]
Number of cigarettes per day: [____]
Mother drinks: Yes [__] No [__] Mother drank during pregnancy: Yes [__] No [__]
Volume per day: [_____]
Observations

ANNEX 39.B
PRENATAL CARE CHARACTERISTICS OF MOTHERS OF CHILDREN UNDER 5 ASSOCIATED WITH A GREATER INCIDENCE AND SEVERITY OF CHILDHOOD ILLNESS

DATA SUMMARY TABLE

Study Group: _____

VARIABLE	TOTAL	YES	NO	NO INFORMATION
Last delivery was at home				
Did not have prenatal care during last pregnancy				
Had 2 or fewer prenatal care visits during last pregnancy				
Had first prenatal care visit in the seventh month of pregnancy				
Smoked 10 or more cigarettes per day during pregnancy				
Mothers believe that intestinal parasitic diseases have little or no importance				
Drank more than 500 ml of alcoholic beverage per day during				

Observations:

Instructions for Completing the Data Summary Table:

1. In the *Study group* space provided at the upper left of the table, write in either *cases* or *controls*. If the group is to be further subdivided—i.e. to separate children with serious diseases as opposed to those with vaccine-preventable diseases—, then two separate data summary tables must be prepared. This procedure should also be followed in the event that the total group is to be subdivided with respect to other variables, such as by sex or age group. Whenever subdividing the total group, care should be taken to ensure that the resulting number is not so low that it would invalidate conclusions.

2. Once the different subgroups have been defined, separate the household survey forms to facilitate the consolidation of the data. In the event that groups were prepared with overlapping variables (i.e. by age group, sex, and diagnosis), some forms will be in more than one group (i.e. female, 2 to 11 months, serious pneumonia).

3. Next, separate the household survey forms into as many groups as data summary tables that have been prepared. Select one of the data summary tables and pick up the corresponding pile of forms. Examine the first form and locate the information sought on each variable included in the first column. If the variable is answered in the affirmative, place a mark in the **YES** column; in the **NO** column if the variable is answered in the negative; and in the **NO INFORMATION** column information about the variable is provided on the household survey form.

4. Once all rows of the data summary table have been completed for the first household survey form, continue with the second, and so on, until recording all available forms in the corresponding data summary table.

5. Once all survey forms have been reviewed and recorded in the data summary table, add the marks in each cell and write the resulting number in that cell.

6. Once all data contained on the household survey forms have been transferred, tally the marks in each row of the data summary tables to obtain the **Total**.

7. Transcribe the data to tables according to Table II, provided in Annex 34.C. This will facilitate calculation of indicators or probability ratios.

PART VIII

STUDIES ON OTHER CAUSES OF DISEASE AND HEALTH PROBLEMS IN CHILDREN

PROTOCOL 40

UTILIZATION AND CHARACTERISTICS OF THE DEMAND FOR ANTIBIOTICS TO TREAT ACUTE RESPIRATORY INFECTIONS

INTRODUCTION

Acute respiratory infections are one of the main health problems for children in the majority of developing countries. Medical care for these diseases represents a high percentage of the total demand for pediatric health services.

Studies show that current possibilities of controlling these diseases essentially center on resolving two problems:

- mothers' delay in seeking medical care, probably due to a lack of knowledge about the warning signs of the severity of the child's condition; and

- inappropriate management of children's medical visits, as reflected in the lack of standard criteria for diagnosis and treatment.

One of the main problems regarding the second point is the high degree of antibiotics use to treat acute respiratory infections that are usually of viral origin. The reasons for this situation are complex and include:

- health workers prescribing antibiotics for acute respiratory infections either as a result of inappropriate treatment criteria or at the request of the mother; and

- mothers administering antibiotics themselves based on previous advice or cases.

The wide availability and use of antibiotics, particularly in developing countries, reinforce these problems. Drug retailers play a more important role because in many cases they are the population's first contact with the health system, and are therefore responsible for providing appropriate guidance.

OBJECTIVES

- To determine the dispense of antibiotics in pharmacies to treat child respiratory infections
- To describe the demand for antibiotics in pharmacies to treat acute respiratory diseases

The methods for determining sample size are described in the section on estimate studies in the Statistical Methodology Support Module in Part II. If an estimate can be made of the variables to be studied, the size of the sample should be calculated taking into account that a type I error will be set at 5% or 0.05 and a type II error will be set at 20% or 0.20.

METHODOLOGY

The study will focus on the drug retailers (pharmacies, drugstores, etc.) that have agreed to take part in the study. In order to measure the first objective proposed, the proportion of antibiotics dispensed to treat cases of ARI diagnosed in children under 5 years should be observed.

With regard to the second objective, information will be gathered about the type of antibiotic given and the location of the respiratory disease (upper or lower respiratory tract).

A table has been designed for gathering and recording information about the dispense of antibiotics, and can be found in Annex 40.A. The table may be modified according to the characteristics of the study. However, the availability of information will have to be borne in mind because the source is doctors' prescriptions or sometimes only information from the person requesting or purchasing the drug.

Data will be obtained on:

- the total number of dispenses;
- the number of all antibiotics dispensed;
- the number of antibiotics dispensed for respiratory problems, differentiating upper and lower respiratory tract; and
- type of antibiotics (generic name).

The period of the study will be determined by the quantity of antibiotics dispensed by pharmacies to obtain a sufficient sample that can be divided into subgroups: type of antibiotic, location of the respiratory disease, etc. It is also recommended that the study be carried out during a period when there is a high incidence of respiratory infections.

The information recorded should be tabulated to glean information about the number of antibiotics dispensed for ARI cases by type of respiratory infection and antibiotic administered.

This information should be obtained for the different age groups selected. Annex 40.B provides an example of a data summary table.

Based on information in this table, indicators can be calculated about the antibiotics used to treat each type of diagnosis. Table 40.1 includes some examples. Other indicators can be calculated based on these examples.

TABLE 40.1

INDICATOR	NUMERATOR	DENOMINATOR
Proportion of antibiotics dispensed versus the total number of drugs dispensed to children under 5	Number of antibiotics dispensed to children under 5	Total number of drugs dispensed to children under 5
Proportion of antibiotics dispensed for ARI treatment versus the total number of antibiotics dispensed to children under 5	Number of antibiotics dispensed to treat ARI in children under 5	Total number of antibiotics dispensed to children under 5
Proportion of antibiotics dispensed to treat ARI in the lower respiratory tract versus the total number of antibiotics to treat ARI in children under 5	Number of antibiotics dispensed to treat ARI in the lower respiratory tract of children under 5	Total number of antibiotics dispensed to treat ARI in children under 5
Proportion of amoxicillin dispensed to treat ARI versus the total number of antibiotics dispensed to treat ARI in children under 5	Number of amoxicillin dispensed to treat ARI in children under 5	Total number of antibiotics dispensed to treat ARI in children under 5

ANNEX 40.A
ANTIBIOTICS DISPENSED TO TREAT ACUTE RESPIRATORY INFECTION CASES

INFORMATION RECORD

Pharmacy: _____ Period/Year: _____

DATE Dispense Number	AGE	WITH A PRESCRIPTION FOR ANTIBIOTICS (mark with an x)											No Prescription (mark with an x)	REASON FOR TREATMENT (mark with an x)		
		Penicillin G	Ampicillin	Amoxicillin	Cephalosporin	Erythromycin	Cotrimoxazole	Aminoglycoside	Chloramphenicol	Tetracycline	Rifampicin	Other		Respiratory Tract		Other
														Upper	Lower	

Observations:

ANNEX 40.B
ANTIBIOTICS DISPENSED TO TREAT ACUTE RESPIRATORY INFECTION CASES

Phramacy: _____ Period/Year: _____ Age Group:_____

	TOTAL	WITH A PRESCRIPTION FOR ANTIBIOTICS												With no Prescription for Antibiotics	Unspecified
		Penicilina G	Ampicilina	Amoxicilina	Cefalosporina	Eritromicina	Cotrimoxazol	Aminoglucósido	Cloranfenicol	Tetraciclina	Rifampicina	Otro	TOTAL		
TOTAL DISPENSE OF DRUGS															
TOTAL ARI CASES															
UPPER RESPIRATORY TRACT ARI															
LOWER RESPIRATORY TRACT ARI															
UNSPECIFIED LOCATION															

Observations:

Completing the data summary table (Annex B):

1. Complete the upper part of the table, writing the name of the pharmacy, the period (week, month, months; and the year) corresponding to the information to be tabulated and the age group (child under 1 year and from 1 to 4 years, or other groups if desired). One table should be used for each age group.

2. Select the record of drugs dispensed.

3. Identify the drugs dispensed, then proceed as follows.

   3.1 If it is not an ARI case and an antibiotic was prescribed, make a mark (I) in the first row for the corresponding antibiotic.

   3.2 If no antibiotic was prescribed, make a mark (I) in the **With No Prescription for Antibiotics** column.

   3.3 If the prescribed treatment was not specified, make a mark (I) in the **Unspecified Treatment** column.

   3.4 If it is an ARI case and an antibiotic was prescribed, make a mark (I) in the row corresponding to the ARI location (upper or lower respiratory tract, or unspecified) and to the antibiotic.

   3.5 If it is an ARI case and an antibiotic was not prescribed, make a mark (I) in the row corresponding to the ARI location (upper or lower respiratory tract, or unspecified) and in the **With No Prescription for Antibiotics** column**.**

   3.6 If it is an ARI and the prescribed treatment was not specified, make a mark (I) in the row corresponding to the ARI location (upper or lower respiratory tract, or unspecified) and in the **Unspecified Treatment** column.

4. Once the record corresponding to the selected period is completed, add the number of marks (I) in each box of the table and write down the sum in each one.

5. Total the numbers in all the boxes of each column to obtain the table's various totals.

PROTOCOL 41

PREVALENCE OF BRONCHIAL OBSTRUCTION SYNDROME IN CHILDREN UNDER 3 YEARS

INTRODUCTION

In the majority of countries, acute respiratory infections are the leading cause of health interventions for children under 5 years, representing between 40% and 60% of all patient visits for this age group. The majority of cases treated are upper respiratory tract infections, mainly colds and pharyngitis. Lower respiratory tract infections diagnosed by primary health care services are generally due to bronchitis, with a relatively small number of cases of pneumonia and bronchiolitis.

A variable number of ARI cases are accompanied by different degrees of difficulty breathing due to obstruction and manifested in wheezing. During winter, children under 3 can suffer from viral symptoms brought on by respiratory syncytial virus, adenovirus or others, known as bronchiolitis. Only a few pediatric health centers carry out viral etiological diagnoses, meaning that these cases are usually diagnosed as bronchial syndrome. Bronchial Obstruction Syndrome (BOS) refers to a single-episode case and Chronic Bronchial Obstruction Syndrome (CBOS) refers to repeated episodes. Older children with chronic bronchial spasticity are habitually diagnosed as having bronchial asthma.

The frequencies of these symptoms vary among and even within countries. It is estimated that between 20 and 30% of children suffer from CBOS and between 10 and 15% have asthma, representing a large number of child patient visits to health centers.

Knowledge about the frequency of these problems in health services is important—not because of the severity cases since most episodes of bronchial obstruction and asthma are not serious, but rather because these problems are a major reason for medical care. Moreover, these cases are not always appropriately managed and children's health may be potentially endangered.

OBJECTIVES

To evaluate among children under 3 years:

- the prevalence of BOS and CBOS and in the population;
- the proportion of patient visits that BOS and CBOS represent; and
- the proportion of BOS and CBOS that lead to hospitalization.

METHODOLOGY

Parents will be surveyed to meet their first objective. In this survey, parents will be asked about the occurrence of wheezing episodes in their children under 3 years. Parents could be interviewed at health centers in the areas being studied or in their homes.

The first methodology is simpler and would require fewer resources to implement. However, the disadvantage is that it would not establish the prevalence of BOS and CBOS among the population in the area being studied, unless it were possible to guarantee that the patient visits of children under 3 years to selected health services are representative of the entire population. Using this methodology would make it impossible to identify those cases where parents do not take their children to health centers.

Carrying out the survey by visiting the homes of parents would make it possible to estimate prevalence either by studying all children in this age group or by employing a sampling technique. However, depending on the estimated incidence of the disease, a larger number of visits may have to be carried out, substantially increasing costs.

In calculating the size of the sample and the period of observation, an approximate idea of the prevalence of the problem will be needed. The methods for determining sample size are described in the section on estimate studies in the Statistical Methodology Support Module in Part II.

With regard to the other objectives, records of outpatient visits and hospitalizations will be reviewed to determine how many children under 3 years experienced wheezing and what proportion they represented of children under 3 years who received care.

Survey of parents

- Parents of children under 3 years will be consulted on the following.
- If the child has ever had a wheezing episode (some type of whistling when air is expelled from the lungs, high-pitched whistling sounds, difficult breathing, grunting, bronchiospasm, fatigue).
- If the child has experienced wheezing, whether this was an isolated or repeated event.
- If the child was hospitalized at some time because of an obstructive respiratory disease.
- If the child has had an obstructive respiratory disease and if the type of treatment administered can be recalled, particularly if the child was given oxygen, or received an oral or vapor bronchodilator, or a corticoid by mouth, inhalation or injection (in these cases, it is always advisable to include some brand names so that the parents can identify the drugs).
- If the child has been given a bronchodilator or corticoid drug (the same clarification as above applies here).

- If the child is currently utilizing some type of bronchodilator or corticoid drug (with the same clarification).

Annex 41.A includes a sample survey form that can be used as a guide for formulating questions. This form can be used during a home visit, an interview outside the home, a telephone survey, or can be sent to the residence by mail or given to children in schools and day-care centers.

In consolidating information, the following criteria are suggested.

- Child without BOS: the child has not had a wheezing episode, has never been given bronchodilators or corticoids, and has not been hospitalized or been administered oxygen due to respiratory disease.

- Child with BOS: the child has had a respiratory disease with wheezing, which was treated on an outpatient basis or a child who has been hospitalized for a respiratory disease and has been administered bronchodilators, corticoids, and eventually oxygen.

- Child with CBOS: the child has had more than one episode of respiratory disease with wheezing treated on an outpatient basis or has had to be hospitalized more than once for respiratory disease, for which he or she was administered bronchodilators, corticoids, and eventually oxygen.

Any computer program that can create databases can be used to process the data. Analysis can be carried out based on different combinations of the variables obtained. Should manual processing be needed, Annex 41.B provides a data summary table for calculating indicators.

Review of health service records

Outpatient and hospitalization records from the health services system covering a given population will be revised. The information will be obtained from:

- Daily outpatient records within health services, and clinical histories or consultation files; emergency room records should also be included since many parents seek medical care for their children with BOS and CBOS when doctor's offices are not open.

- Existing hospitalization records.

To make use of these sources of information, the records must be appropriately kept and include diagnosis and treatment data for both outpatient visits and hospitalizations.

A child will be considered to have BOS when so stated in the records, or when wheezing, bronchiospasm, spasmodic bronchitis, or bronchiolitis have been indicated or when a patient was treated with a bronchodilator with or without corticoid. The rest of the children receiving care, both as outpatients and in the hospital will be classified as "other reasons for visit or hospitalization."

Annex 41.C provides a data summary table to be completed based on the review of health care records.

Based on the information obtained using the two methodologies, the indicators related to the prevalence of BOS in the population and the proportion of outpatient visits and hospitalizations will be calculated. Table 41.1 provides a list of selected indicators. These can be complemented by others considered to be of interest and importance, or that stem from other variables incorporated into the study.

TABLE 41.1

INDICATOR	NUMERATOR	DENOMINATOR
POPULATION		
Prevalence of children under 3 who have or have had BOS	Number of children under 3 who have or have had BOS	Total number of children under 3 studied regarding BOS
Prevalence of children under 3 who have or have had CBOS	Number of children under 3 who have or have had CBOS	Total number of children under 3 studied regarding CBOS
Prevalence of children under 3 who have been treated with a bronchodilator on two or more occasions	Number of children under 3 who are being or have been treated with a bronchodilator on two or more occasions	Number of children under 3 studied regarding the use of bronchodilators
Prevalence of children under 3 who have been hospitalized at least once for BOS	Number of children under 3 who have been hospitalized at least once for BOS	Number of children under 3 studied regarding hospitalization for BOS
HEALTH SERVICES		
Proportion of medical visits among children under 3 whom health workers have classified as CBOS	Number of children under 3 who consulted health services and were classified as having CBOS by health workers	Total number of children under 3 who consulted health services
Proportion of children under 3 who consulted health services and received bronchodilators as treatment	Number of children under 3 who consulted health services and received bronchodilators as treatment	Total number of children under 3 who consulted health services
Proportion of children under 3 hospitalized for BOS	Number of children under 3 hospitalized for BOS during a given time period	Total number of children under 3 hospitalized during that period (for any cause)
Proportion children under 3 hospitalized for CBOS	Number of children under 3 hospitalized for CBOS during a given time period	Number of children under 3 hospitalized for BOS during a given time period
Proportion of children under 3 hospitalized who received bronchodilators as treatment	Number of hospitalized children under 3 who received bronchodilators as treatment during a given time period	Total number of children under 3 hospitalized during that period (for any cause)

ANNEX 41.A

INTERVIEW FORM FOR PARENTS OF CHILDREN UNDER 3

Record number: _____ Place and date: _____

Is there a child under 3 living in the home? Yes [__] No [__]			
Questions about the history of Bronchial Obstruction Syndrome (BOS):			
Age in years and months for each child	Child 1: [____]	Child 2: [____]	Child 3: [____]
Has the child ever experienced wheezing? (respiratory whistling)?	Never [_ __] 1 time [___] > 1 time [___]	Never [___] 1 time [___] > 1 time [___]	Never [___] 1 time [___] > 1 time [___]
If the child has had more than one episode, since when has he or she had them? (in years/months)			
How many episodes did the child have in the last year?			
Has the child ever been administered a bronchodilator? (mention common drug names)?	Yes [__] No [__]	Yes [__] No [__]	Yes [__] No [__]
Has the child ever been treated with bronchodilators associated with oral corticoids? (mention commons drug names)	Yes [__] No [__]	Yes [__] No [__]	Yes [__] No [__]
Has the child ever been hospitalized for a respiratory disease?	Yes [__] No [__]	Yes [__] No [__]	Yes [__] No [__]
Do you remember the cause?			
Did the child have wheezing episodes associated with that disease?	Yes [__] No [__]	Yes [__] No [__]	Yes [__] No [__]
Was the child administered bronchodilators during the disease? (orally, by inhalation)	Yes [__] No [__] Don't know [__]	Yes [__] No [__] Don't know [__]	Yes [__] No [__] Don't know [__]
Was the child administered bronchodilators and corticoids during the disease? (orally by inhalation or injection)	Yes [__] No [__] Don't know [__]	Yes [__] No [__] Don't know [__]	Yes [__] No [__] Don't know [__]
Was the child administered oxygen in addition to bronchodilators and corticoids during the disease?	Yes [__] No [__] Don't know [__]	Yes [__] No [__] Don't know [__]	Yes [__] No [__] Don't know [__]
What was the diagnosis for the child? (literally record the terms used by the mother to describe the physician's diagnosis)			
Is the child currently receiving some treatment for respiratory disease?	Yes [__] No [__] Don't know [__]	Yes [__] No [__] Don't know [__]	Yes [__] No [__] Don't know [__]

Observations:

ANNEX 41.B
DATA SUMMARY TABLE OF PARENT INTERVIEWS

ASPECT	TOTAL	YES	NO	NO INFORMATION
Children who have experienced wheezing (respiratory whistling)				
Children who have had more than one wheezing episode				
Children who have experienced wheezing for more than one year				
Children who experienced wheezing before their first birthday				
Children who had more than two wheezing episodes in the last year				
Children who have been treated with bronchodilators at some point				
Children who have been treated with bronchodilators and corticoids at some point				
Children who have been hospitalized for respiratory disease at some point				
Children who were hospitalized for wheezing				

Observations:

ANNEX 41.C

DATA SUMMARY TABLE OF INFORMATION TAKEN FROM OUTPATIENT AND HOSPITAL RECORDS

CLASSIFICATION	TOTAL	< 1 YEAR	1 YEAR	2 YEARS
TOTAL				
Bronchial Obstruction Syndrome				
Chronic Bronchial Obstruction Syndrome				
Chronic Obstructive Bronchitis (COB)				
Wheezing				
Bronchitis with wheezing				
Spastic bronchitis				
Bronchial spasm				
Bronchiospasm				
Bronchiolitis				
Asthma				

Observations:

TREATMENT	TOTAL	< 1 YEAR	1 YEAR	2 YEAR
TOTAL				
Bronchodilators (Ventolin, Berotec, Oxibron, Clembumar, Teosona, Drylina, Nefoben, Sedacris...)				
Inhaled bronchodilators (Ventolin, Asmatol, Berotec, Salbutol, Oxibron, Clembumar...)				
Oral corticoids (Deltasone B, Celestone, Corteroid, Meticorten...)				
Injectable corticoids (Decadron, Solucortril, Hydrocortisone...)				

Observations:

Completing the data summary table of parent interviews

This form can be used to summarize the information obtained from interviews with parents of children under 3 years, if the data is to be manually consolidated. In order to complete the data summary table, the following procedure should be carried out:

1. Decide whether data will be processed as a whole, or if certain groups will be studied. For example, it may be of interest to study various age groups, such as children under 1 year, children from 1 to 2 years of age, and 3-year-old children. Other variables can also be incorporated into the interview (monthly income, number of people per room, parents who smoke, etc.), and, therefore, it may be worthwhile to break down the total number of interview forms according to variables.

2. Prepare a data summary table for every group of completed interview forms, and identify the group in the upper part of the data summary table: children under 1 year, children of smokers, etc. The variable should be previously defined. In the case of the *smokers* variable, what is understood by that term must be specified (whether both parents smoke or only one, if they smoke in the home or around the child, the number of cigarettes they smoke, how long they have smoked around the child, etc.).

3. Take the first interview form and determine in which data summary table the information should be recorded. The forms may include information for more than one child, meaning that a single form may correspond to different groups. For example, if the forms are separated by age group, two children described on a single form may need to be included in different data summary tables.

4. Read the first aspect listed in the data summary table and find the response on the interview form. Place the response in the corresponding Information Consolidation Table by marking (I) the box in the **Total** column and in one of the three following boxes. Mark **Yes**, if the response is affirmative, **No** if the response is negative, and **No Information** if the form does not provide this information, either because the question was not asked or because the interviewee did not have or did not want to give a response. The rows of the table include different categories applied to all the children being studied. The denominator for each row is the **Total** box of that same row. Consequently, all the children should be registered in one of the boxes **Yes**, **No** or **No Information** in all the rows.

5. Continue on to the next aspect in the following row and carry out the same procedure. Fill in the information for all the aspects in the data summary table, including those that may have been added on to the interview form.

6. Once the information has been recorded for each group designated for the population being studied, add up the marks (I) in each box and verify that the total of the categories **Yes, No,** and **No Information** in every row coincides with the **Total.**

7. When calculating the percentages of affirmative and negative responses, the number in the **No Information** column should be subtracted from the **Total.**

Completing the data summary table on outpatient visits and hospitalizations

1. This table can be used to consolidate information from outpatient and hospitalization records where the frequency of care provided for BOS has been studied.

2. Complete the upper part of the data summary table with information on the health service and time period being studied. Clearly specify whether outpatient or hospital services are being studied. In the latter case, specify what hospital service was involved: pediatrics; medical clinic; outpatient clinic; emergency room, etc.

3. Take the record of health services corresponding to the first day of the period being studied and begin to complete the table.

4. Use the second row of the Table (**Total**) to note the number of children receiving medical care in each age group included in the table.

5. In the following rows, note the number of children receiving medical care during that period and whom health workers gave one of the corresponding diagnoses in the first column. Make a mark (|) in that row in the corresponding box in the **Total** column and also in the box corresponding to the child's age. Each child should be registered only once even though the child's file or clinical history may include several diagnosis categories from the first column of the table. In these cases, the primary diagnosis in the record or clinical history should be selected.

6. Similarly, in order to complete the part of the table related to treatment, select the rows corresponding to the treatment the health workers gave to the child. Make a mark (I) first in the corresponding box of the **Total** column and then in the box corresponding to the age column of the child.

7. Proceed similarly with all the cases and then add together the marks in each box and calculate the totals in the same way as the diagnosis information.

PROTOCOL 42

PREVALENCE OF ASTHMA IN CHILDREN AGED 5 TO 14 YEARS

INTRODUCTION

Certain incidences of ARI that health services treat involve some form of respiratory tract obstructions. In the majority of cases, these episodes are not severe, but may require some form of treatment, such as a bronchodilator, which increases airflow and increases the child's well being. These ARI are sometimes infectious in origin, are sometimes associated with chronic inflammation of the respiratory tract, and are produced *after* to air-borne allergens and irritants in genetically predisposed and frequently atopic subjects. Symptoms tend to worsen with exercise or excessive tension. In children under 3 years, episodes of this type are generally classified as chronic bronchial obstruction syndrome. In older children, the recurrence of these episodes and the frequent use of bronchodilators to stimulate beta 2 receptors are the criteria for diagnosing asthma.

The frequency of asthma cases among the population differs by place, and there are many variables that can determine the distribution of the disease. In all cases, asthma is a burden for health care services, particularly taking into account the different criteria for managing the disease indexes, diagnosing the disease, and using drugs. For this reason, it is highly important to learn about the magnitude of medical care that asthma represents within the total number of child medical visits, in order to gear efforts to make more efficient and improve the quality of care provided to the population.

OBJECTIVES

- Learn about the prevalence of asthma among the children aged 5 to 14 years in the population.
- Discover the proportion of children aged 5 to 14 years classified as having asthma among children in this age group who received medical care.

METHODOLOGY

A survey of parents will be carried out to achieve the first objective. They will be asked whether they have children between 5 and 14 years of age in the home who have been diagnosed with asthma. The study can be given to parents visiting one or more health services in the area or carried out through home visits.

The first methodology is simpler and requires fewer resources to implement. However, its disadvantage is that it still is not possible to establish the prevalence of asthma in the population of the area without a guarantee that the medical visits of children between 5 and 14 years to selected health services provide a sample of all this population.

Carrying out the interview through home visits would make it possible to estimate the prevalence, either by studying all children in this age group or through a sampling technique. However,

depending on the estimated incidence of the disease, a larger number of home visits may need to be carried out, significantly increasing costs.

To calculate the size of the population to be studied and the period of observation, there should be an approximate idea of the prevalence of the problem. The methods for determining sample size are described in the section on estimate studies in the Statistical Methodology Support Module in Part II.

To meet the second objective, records of outpatient visits and hospitalizations will be reviewed to determine the number of children between 5 and 14 years of age that are classified as having asthma. Additionally, determine the proportion of children between 5 and 14 years with asthma represents out of the total number of children from 5 to 14 years that made use of health services.

Survey of parents

Parents with children between 5 and 14 years of age will be interviewed concerning:

- If there is a child in this age group that has been diagnosed by a physician as having asthma.

- If any of the children in this age group have ever had a wheezing episode (a type of whistling when air is released from the lungs, high-pitched or difficult breathing, fatigue, tightness in the chest) or chronic cough that increases during the night or after physical exercise and, if so, how many times these episodes have occurred in the last year.

- If any of the children in this age group have been hospitalized at some time because of respiratory disease.

- If so, what type of disease was it, and can the parents recall the type of treatment administered, particularly if oxygen was given, or whether the child was given some bronchodilator or corticoid (in these cases, it is always advisable to include some brand names so that the parents can identify the drugs).

- If the child received a bronchodilator or corticoid drug (again mentioning brand names).

- If the child is currently using some type of bronchodilator or corticoid drug (again mentioning brand names).

- If the child is currently being given some type of ongoing anti-asthmatic preventative treatment, administered orally, inhaled or a desensitization vaccine (oral or injected).

- If there is a vaporizer at home, and, if so, for who is it used and how often is it used.

Annex 42.A provides an interview form that can be useful as a guide for formulating the questions. This form can be used during a home visit, at an interview outside of the residence, for a telephone survey, or can be sent to the residence by mail or given to school children to take home.

The following criteria are suggested for consolidating information:

- Child without Asthma: a child who has not had any wheezing episodes, has never been given bronchodilators as an inhaler or orally on either an outpatient or inpatient basis, and has never been hospitalized for respiratory disease requiring treatment with oxygen.

- Child with Asthma: a child who has had four or more wheezing episodes during the year and has had to be medicated with bronchodilators through inhalation, vaporization or orally, theophyllines or corticoids, or was hospitalized and treated with oxygen, bronchodilators or corticoids.

Child with Probable Asthma:

1. A child who has had less than 4 episodes of wheezing and has had to be medicated with bronchodilators (inhalation, vaporization or orally), theophyllines, or oral corticoids, or was hospitalized and treated with oxygen, bronchodilators, or corticoids.

2. A child with a chronic cough that worsens at night, after physical exercise, or with laughter.

Any computer program that can be used to prepare databases can be used to process the data. In this way, the analysis can be carried out based on different combinations of the variables obtained.

If data needs to manually processed, Annex 42.B includes a data summary table for processing information from taken from the survey forms. It can be used to calculate indicators related to the problem.

Review of health service records

By reviewing the records, it will be possible, primarily, to determine the proportion that health care for asthma cases represents within the total number of medical visits, and ultimately among the number of hospitalizations of children aged 5 to 14 years.

Information on medical care provided by health services for asthma cases will be obtained from:

- Daily outpatient visit records existing at health services and clinical histories or patient files. Since the parents take many children with asthma to emergency rooms outside of business hours of physicians' offices, the records should include emergency room visits.

- Existing hospitalization records.

To make use of these information sources, conditions should be appropriately recorded, including diagnosis and treatment data both for outpatient visits and hospitalizations.

Children will only be considered to have asthma when this diagnosis is registered in the records, or when sufficient information is available to classify asthma based on clinical data and other information in the record. The rest of the children receiving care, either on an outpatient basis or through hospitalization will be classified as *other reasons for visit or hospitalization.*

Annex 42.C provides a data summary table to be completed based on the review of health service records.

Based on information obtained using these two methodologies, the indicators on the prevalence of asthma will be calculated for the population, as will the proportion of medical visits and hospitalizations that asthma represents. Table 42.1 provides a list of some indicators, which can be complemented with other indicators considered to be of interest and importance, or that may arise from other variables incorporated into the study.

TABLE 42.1

INDICATOR	NUMERATOR	DENOMINATOR
POPULATION		
Prevalence of children aged 5 to 14 that have or have had asthma	Number of children aged 5 to 14 that have or have had asthma	Total number of children aged 5 to 14 studied regarding asthma
Prevalence of children aged 5 to 14 being treated with bronchodilators	Number of children aged 5 to 14 being treated with bronchodilators	Total number of children aged 5 to 14 studied regarding the use of bronchodilators
Prevalence of children aged 5 to 14 receiving antasthmatic preventive treatment	Number of children aged 5 to 14 receiving antasthmatic preventive treatment	Total number of children aged 5 to 14 studied regarding the use of antasthmatic preventive treatment
HEALTH SERVICES		
Proportion of children aged 5 to 14 hospitalized for asthma	Number of children aged 5 to 14 hospitalized for asthma	Total number of children aged 5 to 14 hospitalized for any cause
Proportion of medical visits of children aged 5 to 14 classified as having asthma by health workers	Number of consultations of children aged 5 to 14 classified as having asthma by health workers	Total number of children aged 5 to 14 that consulted health services
Proportion of children aged 5 to 14 that consulted health services and received a bronchodilator as treatment	Number of children aged 5 to 14 that consulted health services and received a bronchodilator as treatment	Total number of children aged 5 to 14 that consulted health services

ANNEX 42.A

INTERVIEW RECORD FOR PARENTS OF CHILDREN AGED 5 TO 14

Record number: _____ Place and date: _____

Does a child aged 5 to 14 live in the home? Yes [__] No [__]		
Ask whether some of the children have asthma and inquire about wheezing episodes, the use of bronchodilators, corticoids, and vaporizers.		
Age in years of each child	Child 1: [_____]	Child 2: [____]
Has the child had some respiratory disease that a physician has classified as asthma?	Yes [__] No [__]	Yes [__] No [__]
Has the child ever been given bronchodilators? (mention common drug names)	Yes [__] No [__]	Yes [__] No [__]
Has the child ever been given bronchodilators and corticoids?	Yes [__] No [__]	Yes [__] No [__]
Has the child ever experienced wheezing (whistling respiration)?	Never [___] 1 time [___] > 1 time [___]	Never [___] 1 time [___] > 1 time [___]
How many has the child had in the last year?		
In the last 12 months, what was the average frequency of wheezing crises and did they interfere with the child's sleep?	Never [ ] Less than 1 time per week [ ] One or more nights per week [ ]	Never [ ] Less than 1 time per week [ ] One or more nights per week [ ]
n the last 12 months, has the child had a wheezing crisis so intense that it prevented the child from saying more than 2 words between each breath?	Yes [__] No [__]	Yes [__] No [__]
In the last 12 months, has the child experienced wheezing after physical exercise?	Yes [__] No [__]	Yes [__] No [__]
In the last 12 months, has the child experienced dry cough without having the flu or any other respiratory disease?	Yes [__] No [__]	Yes [__] No [__]
If the child has had more than 1 wheezing episode, since when has he experienced them (in years/months)?		

Has the child ever been hospitalized for respiratory disease?	Yes [__] No [__] How many times? __	Yes [__] No [__] How many times? __
Do you recall the cause?		
Did the child experience wheezing episodes as part of that disease?	Yes [__] No [__]	Yes [__] No [__]
Was the child administered bronchodilators during that disease (orally, vaporization)?	Yes [__] No [__]	Yes [__] No [__]
Was the child administered bronchodilators and corticoids during the disease? (orally, vaporization, injection)	Yes [__] No [__]	Yes [__] No [__]
Has the child ever been given oxygen?	Yes [__] No [__] How many times? __	Yes [__] No [__] How many times? __
Do you have a vaporizer at home?	Yes [__] No [__]	Yes [__] No [__]
Do you use the vaporizer for any of the children aged 5 to 14 years?	Yes [__] No [__]	Yes [__] No [__]
If the vaporizer is used for the child, with what frequency is it used (per week, month, year)?		
If the vaporizer is used for the child, do you use only water, or do you add some remedy to release in the air?		
Observations:		

ANNEX 42.B

INFORMATION CONSOLIDATION TABLE FOR INTERVIEW WITH PARENTS

ASPECT	TOTAL	YES	NO	NO INFORMATION
Children diagnosed with asthma by a physician as the result of a respiratory disease				
Children who have experienced wheezing (whistling respiration)				
Children who have experienced wheezing more than once				
Children who have experienced wheezing for more than 1 year				
Children who experienced wheezing before their first birthdays				
Children who have had more than 3 wheezing episodes in the last year				
Children with chronic cough that worsens at night or as a result of exercise or laughter				
Children who have received bronchodilators at one time				

ASPECT	TOTAL	YES	NO	NO INFORMATION
Children who received bronchodilators and corticoids at one time				
Children who are receiving bronchodilators				
Children who received or are receiving anti-asthmatic preventive treatment at some time				
Children who have been hospitalized for a wheezing episode				
Children who utilize the vaporizer at least 1 time a month				
Children with asthma that use a vaporizer containing only water				
Children with asthma that required hospitalization and received preventive anti-asthmatic treatment				

Observations:

ANNEX 42.C

INFORMATION CONSOLIDATION TABLE FOR RECORDS OF CONSULTATIONS AND HOSPITALIZATIONS

CLASSIFICATION	TOTAL	5-9 YEARS	10-14 YEARS
TOTAL			
Asthma			
Wheezing			
Sibilant bronchitis			
Spasmodic bronchitis			
Bronchial spasticity			
Bronchiospasm			
Asthmatic bronchitis			
Bronchial obstruction syndrome			
TREATAMENT	**TOTAL**	**5-9 YEARS**	**10-14 YEARS**
TOTAL			
Bronchodilators			
Corticoids			
Vaporizers using bronchodilators			

Observations:

Instructions for completing the data summary table on parent interviews

This form can be utilized to consolidate information from interviews with parents of children between 5 and 14 years of age, if the goal is to make a consolidated manual of this information. Use the following procedure to complete the data summary table.

1. Decide if data will be processed as a whole, or if certain groups will be studied. For example, it may be of interest to study different age groups, such as children between 5 and 9 years of age and children between 10 and 14 years. Other variables can also be incorporated into the interview (monthly income, number of people by room, smoking of the parents, etc.), and, therefore, it may be worthwhile to break down the total number of interview forms in relation to variables.

2. Prepare a data summary table for each group of survey forms and identify the group in the upper part of the data summary table. For example, children aged 5 to 14, or children of smokers, etc. The definition of the variable should be specified previously. In case of the *smokers* variable, what is understood by that term must be specified (whether both parents smoke or only one, if they smoke in the home or around the child, the number of cigarettes they smoke, how long they have smoked around the child, etc.).

3. Take the first interview form and determine in which data summary table the information should be recorded. The forms may include information for more than one child, meaning that one form may correspond to different groups. For example, if the forms are separated by age group, two children described on a single form may need to be included in different data summary tables.

4. Read the first aspect listed in the data summary table and find the response on the interview form. Place the response in the corresponding data summary table by marking (I) the box in the **Total** column and one of the three following boxes. Mark **Yes**, if the response is affirmative, **No** if the response is negative, and **No Information** if the form does not provide this information, either because the question was not asked or because the interviewee did not have or did not want to give a response. The rows of the table include different categories applied to all the children being studied. The denominator for each row is the **Total** box of that same row. Consequently, all the children should be registered in one of the boxes **Yes**, **No** or **No Information** in all the rows.

5. Continue on to the next aspect in the following row and carry out the same procedure. Fill in the information for all the aspects included in the data summary table, even those that are to be added to the Interview Record.

6. Once the information has been recorded for each group designated for the population being studied, add up the marks (I) in each box and verify that the total of the categories **Yes, No,** and **No Information** on every row coincides with the **Total.**

7. When calculating the percentages of affirmative and negative responses, the number in the **No Information** should be subtracted from the **Total.**

Instructions for the completing the data summary table on medical visits and hospitalizations

1. This table can be utilized to consolidate information from outpatient and hospitalization records where the frequency of care provided for BOS has been studied.

2. First, complete the upper part of the data summary table with the data corresponding to the health service and the time period being studied. Clearly specify whether it refers to outpatient health care or hospitalization. In the latter case, specify what hospital service was involved: pediatrics; medical clinic; outpatient clinic; emergency room, etc.

3. Take the record of health services corresponding to the first day of the period being studied and begin to complete the table.

4. Use the second row of the table (**Total**) to note the number of children in each age group included in the table that received medical services.

5. In the following rows, note the number of children receiving medical care during that period and whom health workers gave one of the corresponding diagnoses in the first column. Make a mark (|) in that row in the corresponding box in the **Total** column and also in the box corresponding to the child's age. Each child should be registered only once even though the child's file or clinical history may include several diagnosis categories from the first column of the Table. In these cases, the primary diagnosis in the record or clinical history should be selected.

6. Follow a similar procedure to complete the treatment portion of the table: select the row corresponding to the treatment the health worker administered to the child and make a mark (I) first in the **Total** box and then in the box in the applicable column.

7. Proceed similarly with all the cases and then add together the marks in each box and calculate the totals in the same way explained for consolidating diagnosis information.

PROTOCOL 43

CRITERIA USED BY HEALTH WORKERS TO DIAGNOSE ASTHMA AND BRONCHIAL OBSTRUCTION SYNDROME IN CHILDREN

INTRODUCTION

Respiratory problems are often the reason why parents take their children to health services. During the first years of life, respiratory diseases repeatedly affect children and these are sometimes manifested with bronchial obstruction and wheezing. During early childhood, the majority of these episodes is generically described as Bronchial Obstruction Syndrome (BOS). If these incidences persist and recur, children may possibly be diagnosed with asthma.

The diagnosis and the treatment of both problems are generally carried out based on different criteria, depending on the education and experience of health personnel and the capacity of health services. By analyzing these criteria, positive and negative aspects can be seen in the elements used to make diagnoses.

Given that, in some areas, wheezing and bronchial obstruction are often the reason for seeking medical care, these episodes occupy most of health workers' time. Managing these cases also requires more time than normal because many of the recommended procedures (use of vaporizers, inhaled bronchodilators, and reevaluation) have to be carried out at health facilities. Episodes that do not need to be managed at health facilities require greater time and resources on the part of families, and the repeated occurrence of these episodes affects family dynamics.

Even though these problems have little effect on child mortality, morbidity poses a major challenge to achieving quality health care, implying a more efficient use of available resources.

The Integrated Management of Childhood Illness strategy includes standardized criteria for systematizing and streamlining the evaluation, classification, and treatment of the problems most frequently affecting child health. Based on the indications of these criteria, they can be applied in the home to define the need to seek out medical care, and in health centers can be used to determine the most advisable treatment.

The general IMCI strategy does not take into account bronchial obstruction and wheezing episodes in children under 5, lending priority instead to other health problems that most often result in death. However, the strategy should be adapted according to the particular situation of a location, making it possible to incorporate clinical management criteria for other health problems not included in the general strategy, among which bronchial obstruction can be considered one of the most important in terms of child morbidity.

The frequency with which this type of episode affects child health, as well as how health services handle them, are very important factors in the need to incorporate elements to standardize the diagnosis and treatment of these cases.

OBJECTIVE

To describe health personnel criteria for diagnosing Bronchial Obstruction Syndrome (BOS) in children under 2 and in children between 2 and 14 years of age.

METHODOLOGY

The following activities will be carried out to meet the proposed objective:

- A review of health records of children under 15 years who made use of health services because of wheezing or bronchial obstruction, in order to evaluate which elements health workers considered in diagnosing BOS or asthma; and

- A survey of health workers to investigate the criteria being used to evaluate children who seek medical care for wheezing or bronchial obstruction and to diagnose BOS and asthma.

The methods for determining sample size are described in the section on estimate studies in the Statistical Methodology Support Module in Part II.

Review of health records

The goal of reviewing health records is to discover what elements health workers take into account when they evaluate and diagnose children receiving medical attention for wheezing or bronchial obstruction. The records to be reviewed include all those used in health services, including out-patient files or forms, ambulatory clinical files or histories, and hospitalization clinical histories. The review should be used to establish the criteria for different health workers, so it should be carried out in more than one service or among the records of different health workers when they work in a single service. The review should show:

- The diagnosis made by health workers in order to select only those records that make mention of BOS or asthma; and

- The signs and symptoms health workers recorded after evaluating these children.

It should be borne in mind that reviewing health records presents some limitations to achieving the study's objective.

- Records of outpatient visits often do not contain information on the child's signs and symptoms, but only on the diagnosis or classification made by health workers and, in some cases on, the treatment prescribed.

- If the outpatient or hospitalization records do contain information on signs and symptoms, there is no assurance that this information is complete and that all the signs and symptoms health workers used to make a classification or diagnosis were recorded. For example, in the majority of the cases, the fact that a sign or symptom has not been recorded does not necessarily mean that health workers did not evaluate it in making a diagnosis. Sometimes, health workers observe and evaluate these signs used for diagnosis, but do not make mention of them in outpatient or hospital records.

- There can be limitations to reviewing the outpatient and hospitalization records of a large number of health workers because this would mean visiting many different health facilities, many of which are distant from each other. Thus, the number of staff included in the study will be restricted, affecting fulfillment of the objective as it relates to differences among the evaluation, classification, and evaluation criteria employed by various health workers. In studying health workers from the same hospital, it should be borne in mind that staff from the same institution would generally apply more similar criteria, with the greatest differences among personnel working in different health services.

- The evaluation and classification criteria of each health worker will be recorded in the study only once, even when many records of the same diagnosis by that person are being reviewed. Thus, in light of the problems mentioned, the same health worker may have different criteria for evaluating and classifying or diagnosing BOS and asthma, as seen in the information discrepancies noted in the records under different circumstances. This will mean that the person reviewing the records will have to define which of the cases reviewed will be used to establish the criteria for that health worker, opening up a margin for error.

If this problem recurs repeatedly, it may be of interest to carry out a complementary study on the variability of health worker criteria for evaluating and classifying or diagnosing BOS and asthma.

Whatever the case may be, caution should be exercised in analyzing the records, so as not to draw false conclusions based on records that do not reflect the totality of the criteria applied to evaluate and diagnose BOS and asthma.

To facilitate the systematization of information obtained from the records of health workers, Annex 43.A includes a sample form that could be useful. The first column includes a series of rows to fill in the name of each health worker included in the study. The second and third columns provide space for noting for each of the criteria used to evaluate and classify or diagnose BOS and asthma.

Survey of health workers

The survey of health workers is the most appropriate methodology for achieving the study objective in that a greater number of health workers can be reached even if they are far from the study headquarters, and, because the survey is anonymous, it makes it possible to maintain confidentiality. By guaranteeing health workers anonymity, they are more likely to answer freely the questions asked. Moreover, since each health worker only responds once and these responses are taken as the criteria of that worker, there is no possibility of different criteria for the same diagnosis.

However, there are some major disadvantages. Carrying out this study will require a sound review of the forms and, in many cases, will not guarantee that the worker is describing the criteria used, but rather those considered appropriate based on his or her knowledge or on consultations with colleagues or reference materials.

Conducting the survey through personal interviews or by telephone increases the likelihood of obtaining responses that reflect the habitual procedures used by the health worker so long as that person cannot consult outside sources (limited to what is available on hand in the case of a telephone interview.) However, this method does not guarantee the confidentiality of the information and may be rejected by the health worker to avoid exposing him or herself to what would be a substandard grading. If the survey is carried out in person, this risk can be decreased by asking health workers to complete the survey in the presence of the interviewer, showing that the form has no identification information and asking him or her to place the completed survey in an envelope, seal it, and mail it. Annex 43.B provides a sample survey form.

Data processing

Data processing of both health care records and the survey will necessitate systematizing certain data summary categories. Annex 43.C provides a sample data summary table.

In the first set of rows in the table, the categories taken from the health care records and surveys should be listed, including the signs, symptoms, and other factors health workers use to determine if a child has BOS or asthma. This information should be taken from the form shown in Annex 43.A or the survey form in Annex 43.B.

The second set of rows details the standard BOS and asthma definitions, the application and knowledge of which is to be evaluated.

Once the data has been summarized, the indicators needed can be calculated to describe existing criteria for evaluating and classifying BOS and asthma in children under 15 years, which is the objective of this study. Table 43.1 includes some indicators, which can be modified or complemented when needed.

TABLE 43.1

INDICATOR	NUMERATOR	DENOMINATOR
Number of criteria found for classifying BOS in a child	None	None
Proportion of health workers whose criterion for diagnosing asthma coincides with the one recommended	Number of health workers whose criterion for diagnosing asthma coincides with the one recommended	Total number of health workers included in the study for whom information was obtained on diagnosing asthma
Proportion of health workers who include _____ among the elements necessary for diagnosing asthma	Number of health workers who include _____ among the elements necessary for diagnosing asthma	Total number of health workers included in the study

ANNEX 43.A

CRITERIA USED BY HEALTH WORKERS TO DIAGNOSE BRONCHIAL OBSTRUCTION SYNDROME AND ASTHMA IN CHILDREN

INFORMATION TAKEN FROM HEALTH RECORDS

Area: _____ Health Services: _____

HEALTH WORKER	CRITERIA FOR CLASSIFYING BRONCHIAL OBSTRUCTION SYNDROME	CRITERIA FOR CLASSIFYING ASTHMA

Observations:

ANNEX 43.B

CRITERIA USED BY HEALTH WORKERS TO DIAGNOSE BRONCHIAL OBSTRUCTION SYNDROME AND ASTHMA IN CHILDREN

SAMPLE SURVEY FORM

1. Did any of the patients you treated last month have bronchial obstruction syndrome?
Yes [____] No [____]
2. What findings motivated you to make this diagnosis?
2.1
2.2
2.3
2.4
2.5
2.6
3. Did you confirm this diagnose in any way?
Yes [____] No [____]
4. How?
4.1
4.2
4.3

4.4

4.5

4.6

5. Did any of the patients you treated in the last month have asthma?

Yes [____] No [____]

6. What findings motivated you to make this diagnosis?

6.1

6.2

6.3

6.4

6.5

6.6

7. Did you confirm this diagnosis in any way?

Yes [____] No [____]

8. How?

8.1

8.2

8.3
8.4
8.5
8.6
9. What are the minimum findings needed for you to make a diagnosis of asthma?
9.1
9.2
9.3
9.4
9.5
9.6

ANNEX 43.C

CRITERIA USED BY HEALTH WORKERS TO DIAGNOSE BRONCHIAL OBSTRUCTION SYNDROME AND ASTHMA IN CHILDREN DATA SUMMARY TABLE

Area: _____ Health Services: _____

FIRST PART	
DESCRIPTION OF THE CRITERION	NUMBER OF HEALTH WORKERS WHO APPLY IT

SECOND PART				
CRITERION	TOTAL	YES	NO	NO INFORMATION
TOTAL				

Observations:

Instructions for completing the data summary table

The following procedure should be followed to complete the data summary table:

- Write in the first row of the first column, the signs, or symptoms the first health worker included in the study used to classify a child as having BOS. This information can be taken from the form shown in Annex 43.A of from the survey form in Annex 43.B. The box in the right-hand column of that row is then marked.

- Repeat the procedure for the signs or symptoms used to classify asthma.

- Read the signs or symptoms used by the second health worker included in the study to classify a child as having BOS. If they coincide with those of the first health worker, make a mark (I) in the box on the right. If they do not coincide, these signs and symptoms should be noted in the following box of the first column.

- Proceed similarly with the other signs or symptoms used to classify asthma.

- Follow the same procedure for all the health workers included in the study.

- In boxes where there are various marks, these should be added, and the sum noted in those same boxes.

To complete the second part of the data summary table, a comparison should be drawn for each person in the study between the standard definition for classifying BOS and asthma with the definition obtained from the records or survey. The following procedure should be followed to this end:

- Read the signs or symptoms used by each health worker included in the study and make a mark (I) in the **Yes** column when they coincide with the corresponding description in the first column. Mark the **No** column when they do not coincide and the **No Information** column when no information is available on the signs and symptoms used to make the classification.

- Once the second half of the data summary table has been completed, the marks (I) should be added and the sum noted in the same box. Boxes in the same row should be added together, and the result should be written in the box under the **Total** column. Boxes in the same column should be added, and the sum written in the first row of the **Total** column of the second part of the Table.

PROTOCOL 44

CRITERIA USED BY HEALTH WORKERS FOR PROVIDING AMBULATORY CARE TO CHILDREN WITH BRONCHIAL OBSTRUCTION SYNDROME

INTRODUCTION

Respiratory problems are often the reason why parents take their children to health services. During the first years of life, respiratory diseases repeatedly affect children and these are sometimes manifested with bronchial obstruction and wheezing. During early childhood, the majority of these episodes are generically described as Bronchial Obstruction Syndrome (BOS). If these incidences persist and recur, children may possibly be diagnosed with asthma.

The diagnosis and the treatment of both problems are generally carried out based on different criteria, depending on the education and experience of health personnel and the capacity of health services. By analyzing these criteria, positive and negative aspects can be seen in the elements used to make diagnoses.

Given that, in some areas, wheezing and bronchial obstruction are often the reason for seeking medical care, these episodes occupy most of health workers' time. Managing these cases also requires more time than normal because many of the recommended procedures (use of vaporizers, inhaled bronchodilators, and reevaluation) have to be carried out at health facilities. Episodes that do not need to be managed at health facilities require greater time and resources on the part of families, and the repeated occurrence of these episodes affects family dynamics.

Even though these problems have little effect on child mortality, morbidity poses a major challenge to achieving quality health care, implying a more efficient use of available resources.

The Integrated Management of Childhood Illness strategy includes standardized criteria for systematizing and streamlining the evaluation, classification, and treatment of the problems most frequently affecting child health. Based on the indications of these criteria, they can be applied in the home to define the need to seek out medical care, and in health centers can be used to determine the most advisable treatment.

The general IMCI strategy does not take into account bronchial obstruction and wheezing episodes in children under 5 years, lending priority instead to other health problems that most often result in death. However, the strategy should be adapted according to the particular situation of a location, making it possible to incorporate clinical management criteria for other health problems not included in the general strategy, among which bronchial obstruction can be considered one of the most important in terms of child morbidity.

The frequency with which this type of episode affects child health, as well as how health services handle them, are very important factors in the need to incorporate elements to standardize the diagnosis and treatment of these cases.

OBJECTIVES

Describe the criteria health workers apply in providing ambulatory care to children between 2 and 4 years of age suffering form Bronchial Obstruction Syndrome (BOS).

"Ambulatory care" also applies to children with bronchial obstruction syndrome who stay in the hospital for several hours while their response to medication is observed. This protocol can also be used to research the treatment of children hospitalized for bronchial obstruction syndrome.

METHODOLOGY

The following activities will be carried out to meet the proposed objective:

- A review of the health records of children between 2 and 4 years who visited medical facilities and were classified as having BOS, in order to identify the treatment indicated by health workers.

- A survey of health workers to investigate the criteria they use to treat children between 2 and 4 years who have BOS.

The methods for determining sample size are described in the section on estimate studies in the Statistical Methodology Support Module in Part II.

Review of health records

Records can be reviewed at the same time as the process described in Protocol 43 is being carried out to obtain information on the criteria of health workers for diagnosing BOS and asthma. The end goal is to learn about the different kinds of ambulatory care administered and recommended to treat children between 2 and 4 for BOS.

The records to be reviewed are all those used during medical visits, including the outpatient file or consultation form and the ambulatory clinical history or file. The purpose of the review is to establish the treatment criteria of different health workers. Therefore, this should be done for more than one service and among the records of different health workers when they work in a single service.

The review should show:

- The diagnoses made by health workers so as to select only those records that make mention of BOS.

- The age group for which the diagnosis was made so as to select only children between 2 and 4 years of age.

- The treatment prescribed by health workers according to what is recorded.

As was described in Protocol 43, reviewing records poses some limitations on meeting the objective of the study:

- In many instances, outpatient records do not include information on treatment.

- If the outpatient or hospitalization records do contain information on treatment, there is no assurance that this information is complete, and that all treatment indications have been recorded. In some cases, for example, symptomatic measures or support treatment are not applied even though health workers have indicated it. In nearly no cases, will the educational recommendations health workers make for treating the child at home be indicated. In general, health workers only record the treatments involving the use of some drug.

- There can be limitations to reviewing the outpatient and hospitalization records of a large number of health workers because this would mean visiting many different health facilities, many of which are distant from each other. Thus, the number of staff included in the study will be restricted, affecting fulfillment of the objective as it relates to differences among the evaluation, classification, and evaluation criteria employed by various health workers. In studying health workers from the same hospital, it should be borne in mind that staff from the same institution would generally apply more similar criteria, with the greatest differences among personnel working in different health services.

- The evaluation and classification criteria of each health worker will be recorded in the study only once, even when many records of the same diagnosis by that person are being reviewed. Thus, in light of the problems mentioned, the same health worker may have different criteria for evaluating and classifying or diagnosing BOS and asthma, as seen in the information discrepancies noted in the records under different circumstances. This will mean that the person reviewing the records will have to define which of the cases reviewed will be used to establish the criteria for that health worker, opening up a margin for error.

If this problem recurs repeatedly, it may be of interest to carry out a complementary study on the variability of health worker criteria for evaluating and classifying or diagnosing BOS.

Whatever the case may be, caution should be exercised in analyzing the records, so as not to draw false conclusions based on records that do not reflect the totality of the criteria applied to evaluate and diagnose BOS.

To facilitate the systematization of information obtained from the records of health workers, Annex 44.A includes a model form that could be useful. The first column includes a series of rows to fill in the name of each health worker included in the study. The second column provides space for noting for each of the criteria used to evaluate and classify or diagnose BOS.

Survey of health workers

The survey of health workers is the most appropriate methodology for achieving the study objective in that a greater number of health workers can be reached even if they are far from the study headquarters, and, because the survey is anonymous, it makes it possible to maintain confidentiality. By guaranteeing health workers anonymity, they are more likely to answer freely the questions asked. Moreover, since each health worker only responds once and these responses are taken as the criteria of that worker, there is no possibility of different criteria for the same diagnosis.

However, there are some major disadvantages. The contents of the interview form will need to be reviewed, and there is no guarantee that, in many cases, the health workers will not describe the criteria used to treat BOS, but rather those they consider appropriate based on their knowledge and through consultation with colleagues or of reference materials.

Conducting the survey through personal interviews or by telephone increases the likelihood of obtaining responses that reflect the habitual procedures used by the health worker so long as that person cannot consult outside sources (limited to what is available on hand in the case of a telephone interview.) However, this method does not guarantee the confidentiality of the information and may be rejected by the health worker to avoid exposing him or herself to what would be a substandard grading. If the survey is carried out in person, this risk can be decreased by asking health workers to complete the survey in the presence of the interviewer, showing that the form has no identification information and asking him or her to place the completed survey in an envelope, seal it, and mail it. Annex 44.B provides a sample survey form.

Data processing

Data processing of both health care records and the survey will necessitate systematizing certain data summary categories. Annex 44.C provides a sample data summary table.

In the first set of rows in the table, the categories taken from the health care records and surveys should be listed, including the signs, symptoms, and other factors health workers use to determine if a child has BOS or asthma. This information should be taken from the form shown in Annex 44.A or the survey form in Annex 44.B.

In the second series of rows, the standard recommendations for treating BOS in children between 2 and 4 are detailed. The goal is to evaluate the application of and knowledge about these recommendations.

Once the data has been summarized, the indicators needed can be calculated to describe existing criteria for evaluating and classifying BOS in children between 2 and 4 years, which is the objective of this study. Table 44.1 includes some indicators, which can be modified or complemented when needed.

TABLE 44.1

INDICATOR	NUMERATOR	DENOMINATOR
Number of different drugs health workers use in the ambulatory treatment of BOS in children	None (the figure used is the number of different drugs counted)	None
Proportion of the health workers whose criteria for the ambulatory treatment of BOS coincide with the recommended treatment	Number of health workers whose criteria for the ambulatory treatment of BOS coincide with the recommended treatment	Total number of health workers included in the study for whom information was obtained on their criteria for treating BOS
Proportion of the health workers who include _____ in the ambulatory treatment of BOS	Number of health workers who include _____ in the ambulatory treatment of BOS	Total number of health workers included in the study

ANNEX 44.A
CRITERIA USED BY HEALTH WORKERS FOR PROVIDING AMBULATORY CARE FOR CHILDREN 2 TO 4 YEARS OF AGE WITH BRONCHIAL OBSTRUCTION SYNDROME

INFORMATION TAKEN FROM HEALTH RECORDS

Area: _____ Health Service: _____

PERSONNEL	CRITERIA FOR THE AMBULATORY TREATMENT OF BRONCHIAL OBSTRUCTION SYNDROME

Observations:

ANNEX 44.B

CRITERIA USED BY HEALTH WORKERS FOR PROVIDING AMBULATORY CARE FOR CHILDREN 2 TO 4 YEARS OF AGE WITH

BRONCHIAL OBSTRUCTION SYNDROME SAMPLE SURVEY FORM

1. Did any of the patients you treated in the last month present Bronchial Obstruction Syndrome that could be cared for on an outpatient basis, i.e., that did not meet the requirements for hospitalization? Yes [____] No [____]
2. What treatment or recommendations did you give?
2.1
2.2
2.3
2.4
2.5
3. Did you use any medication? Yes [____] No [____]
4. Which?
4,1
4.2
4.3
4.4
4.5
4.6

ANNEX 44.C
CRITERIA USED BY HEALTH WORKERS FOR PROVIDING AMBULATORY CARE TO CHILDREN WITH BRONCHIAL OBSTRUCTION SYNDROME

DATA SUMMARY TABLE

Area: _____ Health Services: _____

FIRST PART	
DESCRIPTION OF THE CRITERION	NUMBER OF HEALTH WORKERS WHO APPLY IT

SECOND PART				
CRITERION	TOTAL	YES	NO	NO INFORMATION
TOTAL				

Observations:

Instructions for completing the data summary table

The following procedure should be followed to complete the data summary table:

- Write in the first row of the first column, the signs, or symptoms the first health worker included in the study used to classify a child as having BOS. This information can be taken from the form shown in Annex 44.A of from the survey form in Annex 44.B. The box in the right-hand column of that row is then marked.

- Read the treatment recommended for BOS or used by the second health worker included in the study. If it coincides with that of the first worker, a mark (I) should be made in the box on the right. If it does not coincide, the mark should be made in the following box of the first column.

- Proceed in the same way for all the health workers included in the study.

- In boxes where there are various marks, these should be added, and the sum noted in the same box.

To complete the second part of the data summary table, a comparison should be drawn for each person in the study between the standard definition for classifying BOS and asthma with the definition obtained from the records or survey. The following procedure should be followed to this end:

- Read the signs or symptoms used by each health worker included in the study and make a mark (I) in the **Yes** column when they coincide with the corresponding description in the first column. Mark the **No** column when they do not coincide and the **No Information** column when no information is available on the signs and symptoms used to make the classification.

- Once the second half of the data summary table has been completed, the marks (I) should be added and the sum noted in the same box. Boxes in the same row should be added together, and the result should be written in the box under the **Total** column. Boxes in the same column should be added, and the sum written in the first row of the **Total** column of the second part of the Table.

PROTOCOL 45

CRITERIA USED BY HEALTH WORKERS TO TREAT ASTHMA IN CHILDREN AGED 5 TO 14

INTRODUCTION

Respiratory problems are often the reason why parents take their children to health services. During the first years of life, children are affected repeatedly by respiratory diseases and these are sometimes manifested with bronchial obstruction and wheezing. During early childhood, the majority of these episodes are generically described as Bronchial Obstruction Syndrome (BOS). If these incidences persist and recur, children may possibly be diagnosed with asthma.

The diagnosis and the treatment of both problems are generally carried out based on different criteria, depending on the education and experience of health personnel and the capacity of health services. By analyzing these criteria, positive and negative aspects can be seen in the elements used to make diagnoses.

Given that, in some areas, wheezing and bronchial obstruction are often the reason for seeking medical care, these episodes occupy most of health workers' time. Managing these cases also requires more time than normal because many of the recommended procedures (use of vaporizers, inhaled bronchodilators, and reevaluation) have to be carried out at health facilities. Episodes that do not need to be managed at health facilities require greater time and resources on the part of families, and the repeated occurrence of these episodes affects family dynamics.

Even though these problems have little effect on child mortality, morbidity poses a major challenge to achieving quality health care, implying a more efficient use of available resources.

The Integrated Management of Childhood Illness strategy includes standardized criteria for systematizing and streamlining the evaluation, classification, and treatment of the problems most frequently affecting child health. Based on the indications of these criteria, they can be applied in the home to define the need to seek out medical care, and in health centers can be used to determine the most advisable treatment.

The general IMCI strategy does not take into account bronchial obstruction and wheezing episodes in children under 5, lending priority instead to other health problems that most often result in death. However, the strategy should be adapted according to the particular situation of a location, making it possible to incorporate clinical management criteria for other health problems not included in the general strategy, among which bronchial obstruction can be considered one of the most important in terms of child morbidity.

The frequency with which this type of episode affects child health, as well as how health services handle them, are very important factors in the need to incorporate elements to standardize the diagnosis and treatment of these cases.

OBJECTIVES

- To describe the criteria health workers use to treat asthmatic crisis in children between 5 and 14 years of age.

- Describe the criteria health workers use for preventative treatment in children between 5 and 14 years of age.

METHODOLOGY

The study group is health workers who treat children with asthma within the services selected for the study.

The following activities will be carried out to meet the proposed objectives:

- A review of the records of children between 5 and 14 years who visited health services and were classified as having asthma in order to identify the treatment health workers prescribe; and

- A survey of health workers to investigate the criteria being used to treat children between 5 and 14 years with asthma.

- The methods for determining sample size are described in the section on estimate studies in the Statistical Methodology Support Module in Part II.

Review of health records

Records can be reviewed simultaneously with the process described in Protocol 43 in order to obtain information on the criteria health workers use to diagnose CBOS and asthma. The goal is to learn about the different types of treatment being used and recommended by health workers to treat asthma in children between 5 and 14 years of age.

The records to be reviewed include all those used in health services, including outpatient files or forms, ambulatory clinical files or histories, and hospitalization clinical histories. The review should be used to establish the criteria for different health workers, so it should be carried out in more than one service or among the records of different health workers when they work in a single service.

The review should show:

- The diagnosis made by health workers in order to select only those records that make mention of asthma.

- The age group for which the diagnosis was made, as only children between 5 and 14 should be studied.

- The treatment health workers prescribed, according to what they noted.

As described in Protocol 43, it should also be taken into account that the review of records poses some limitations to achieving the objective of the study:

- Records of outpatient visits often do not contain information on the child's treatment.

- If the outpatient or hospitalization records do contain information on treatment, there is no assurance that this information is complete, and that all treatment indications have been recorded. In some cases, for example, symptomatic measures or support treatment are not applied even though health workers have indicated it. In nearly no cases, will the educational recommendations health workers make for treating the child at home be indicated. In general, health workers only record treatments involving the use of some drug.

- There can be limitations to reviewing the outpatient and hospitalization records of a large number of health workers because this would mean visiting many different health facilities, many of which are distant from each other. Thus, the number of staff included in the study will be restricted, affecting fulfillment of the objective as it relates to differences among the evaluation, classification, and evaluation criteria employed by various health workers. In studying health workers from the same hospital, it should be borne in mind that staff from the same institution will generally apply more similar criteria, with the greatest differences among personnel working in different health services.

- The evaluation and classification criteria of each health worker will be recorded in the study only once, even when many records of the same diagnosis by that person are being reviewed. Thus, in light of the problems mentioned, the same health worker may have different criteria for evaluating and classifying or diagnosing BOS and asthma, as seen in the information discrepancies noted in the records under different circumstances. This will mean that the person reviewing the records will have to define which of the cases reviewed will be used to establish the criteria for that health worker, opening up a margin for error.

If this problem recurs repeatedly, it may be of interest to carry out a complementary study on the variability of health worker criteria for evaluating and classifying or diagnosing asthma.

Whatever the case may be, caution should be exercised in analyzing the records, so as not to draw false conclusions based on records that do not reflect the totality of the criteria applied to evaluate and diagnose asthma.

To facilitate the systematization of information obtained from the records of health workers, Annex 45.A includes two sample forms that could be useful. The first column includes a series of rows to fill in the name of each health worker included in the study. The second column in the first half of the table provides space for noting the treatment prescribed to treat asthmatic crisis in children. The second column of the second half of the table provides space for noting the preventative asthma treatment.

The following steps are carried out to achieve this end:

- Review the health care records of the first health workers to be included in the study until finding the first diagnosis of asthmatic crisis (or a case of preventative asthma treatment).

- Verify whether the age of the person diagnosed with asthmatic crisis (or administered preventative asthma treatment) falls within the age group being studied (5 to 14 years).

- Read the treatment prescribed by the health worker and note it.

- Indicate on the data collection sheet whether it is a case of asthmatic crisis or preventative asthma treatment.

- Continue to review the records of health workers until finding more cases of patients in the age group being examined in the study. In each case, observe whether the treatment used is the same or different. If it is not the same, the most common treatment should be determined (the one health workers prescribe most frequently) and note it in the corresponding data collection sheet.

- Repeat the previous procedure for all the health workers included in the study.

Survey of health workers

The survey of health workers is the most appropriate methodology for achieving the study objective in that a greater number of health workers can be reached even if they are far from the study headquarters, and, because the survey is anonymous, it makes it possible to maintain confidentiality. By guaranteeing health workers anonymity, they are more likely to answer freely the questions asked. Moreover, since each health worker only responds once and these responses are taken as the criteria of that worker, there is no possibility of different criteria for the same diagnosis.

However, there are some major disadvantages. Carrying out this study will require a sound review of the forms and, in many cases, will not guarantee that the worker is describing the criteria used,

but rather those considered appropriate based on his or her knowledge or on consultations with colleagues or reference materials.

Conducting the survey through personal interviews or by telephone increases the likelihood of obtaining responses that reflect the habitual procedures used by the health worker as long as that person cannot consult outside sources (or will have what is available on hand in the case of a telephone interview.) However, this method does not guarantee the confidentiality of the information and may be rejected by the health worker to avoid exposing him or herself to what would be a substandard grading. If the survey is carried out in person, this risk can be decreased by asking health workers to complete the survey in the presence of the interviewer, showing that the form has no identification information and asking him or her to place the completed survey in an envelope, seal it, and mail it. Annex 45.B provides a sample survey form.

Data processing

Processing the data obtained from both health care records and the survey means that data summary categories will need to be systematized. Annex 45.C provides two sample data summary tables.

In each of these sample tables:

- The treatment criteria identified through health records and the surveys should be noted in the first set of rows. This information should be obtained from the information in Annex 45.A and Annex 45.B.

- In the second set of rows, the standard recommendations for treating asthmatic crisis and providing preventative asthma care among children between 5 and 14 years should be noted for those for which the application of and knowledge about is to be evaluated.

Once the data has been processed, the indicators needed to describe various existing criteria for treating asthmatic crisis and providing preventative asthma treatment to children between 5 and 14 years can be calculated. Table 45.1 includes some indicators, those which can be modified and expanded as appropriate.

TABLE 45.1

INDICATOR	NUMERATOR	DENOMINATOR
Number of criteria identified for treating asthma crisis in children	None (figure is the actual count of the criteria used to treat asthma crises)	None
Number of criteria identified for providing preventative asthma treatment to children	None (figure is the actual count of the different criteria for preventative asthma treatment)	None
Number of different drugs used by health workers to treat asthmatic crisis in children	None (figure is the actual count of the different drugs used to treat asthmatic crisis)	None
Number of different drugs utilized by health workers for the preventive treatment of the asthma in children	None (figure is the actual count of the different drugs of preventative treatment)	None
Proportion of health workers whose criteria for treating asthma crisis coincides with recommended criteria	Number of health workers whose criteria for treating asthma coincides with recommended criteria	Total number of health workers included in the study for whom information was obtained regarding the treatment of asthma
Proportion of health workers whose criteria for preventative asthma treatment coincides with recommended criteria	Number of health workers whose criterion for preventative asthma treatment coincides with recommended criteria	Total number of health workers included in the study for whom information was obtained regarding the treatment of asthma
Proportion of health workers that includes _____ in the treatment of asthmatic crisis and preventative asthma treatment	Number of health workers that includes _____ in the treatment of asthmatic crisis and preventative asthma treatment	Total number of health workers included in the study

ANNEX 45.A
CRITERIA USED BY HEALTH WORKERS TO TREAT ASTHMA IN CHILDREN AGED 5 TO 14 YEARS

INFORMATION TAKEN FROM HEALTH RECORDS
A. TREATMENT OF THE ASTHMA CRISIS

Area: _____ Health Service: _____

HEALTH WORKER	CRITERIA FOR TREATING ASTHMATIC CRISIS

Observations:

ANNEX 45.A
CRITERIA USED BY HEALTH WORKERS TO TREAT ASTHMA IN CHILDREN AGED 5 TO 14 YEARS

INFORMATION TAKEN FROM HEALTH RECORDS
B. PREVENTIVE ASTHMA TREATMENT

Area: _____ Health Service: _____

HEALTH WORKER	CRITERIA USED FOR PREVENTATIVE ASTHMA TREATMENT

Observations:

ANNEX 45.B
CRITERIA USED BY HEALTH WORKERS TO TREAT ASTHMA IN CHILDREN AGED 5 TO 14 YEARS

SURVEY FORM A: TREATMENT OF THE ASTHMA CRISIS

1. Did any of the patients you treated last month demonstrate asthmatic crisis? Yes [____] No [____]
2. What treatment recommendations did you give that patient?
2.1
2.2
2.3
2.4
2.5
3. Did you use any drug? Yes [____] No [____]
4. Which one(s)?
4,1
4.2
4.3
4.4
4.5
4.6

Observations:

CRITERIA USED BY HEALTH WORKERS TO TREAT ASTHMA IN CHILDREN AGED 5 AND 14 YEARS

SURVEY FORM B: PREVENTIVE ASTHMA TREATMENT

1. Did you diagnose asthma in any of the patients you treated? Yes [____] No [____]
2. What preventative treatment recommendations did you give that patient?
2.1
2.2
2.3
2.4
2.5
3. Did you use any kind of drug? Yes [____] No [____]
4. Which one(s)?
4,1
4.2
4.3
4.4
4.5
4.6

Observations:

ANNEX 45.C
CRITERIA USED BY HEALTH WORKERS TO TREAT ASTHMA IN CHILDREN AGED 5 TO 14 YEARS

DATA SUMMARY TABLE
A. TREATMENT OF ASTHMATIC CRISIS

Area: _____ Health Service: _____

FIRST PART	
DESCRIPTION OF CRITERION	NUMBER OF HEALTH WORKERS WHO APPLY IT

SECOND PART				
CRITERION	TOTAL	YES	NO	NO INFORMATION
TOTAL				

Observations:

CRITERIA USED BY HEALTH WORKERS TO TREAT ASTHMA IN CHILDREN AGED 5 TO 14 YEARS

DATA SUMMARY TABLE
B. PREVENTIVE ASTHMA TREATMENT

Area: _____ Health services: _____

FIRST PART	
DESCRIPTION OF CRITERION	NUMBER OF HEALTH WORKERS WHO APPLY IT

SECOND PART				
CRITERION	TOTAL	YES	NO	NO INFORMATION
TOTAL				

Observaciones:

Instructions for completing the data summary table

The following procedure should be followed to complete the data summary table:

- Write in the first row of the first column, the treatment prescribed by the first health worker included in the study. This information can be taken from the form shown in Annex 45.A of from the survey form in Annex 45.B. The box in the right-hand column of that row is then marked.

- Read the treatment recommended or used by the second health worker included in the study. If they coincide with those of the first health worker, make a mark (I) in the box on the right. If they do not coincide, these signs and symptoms should be noted in the following box of the first column.

- Follow the same procedure for all the health workers included in the study.

- In boxes where there are various marks, these should be added, and the sum noted in those same boxes.

To complete the second part of the data summary table, a comparison should be drawn for each person in the study between the standard asthma treatment selected and the treatment actually applied. The following procedure should be followed to this end:

- Read the treatment for asthmatic crisis and preventative care applied by each health worker included in the study and make a mark (I) in the **Yes** column when they coincide with the corresponding description in the first column. Mark the **No** column when they do not coincide and the **No Information** column when no information is available on the signs and symptoms used to make the classification.

- Once the second half of the data summary table has been completed, the marks (I) should be added and the sum noted in the same box. Boxes in the same row should be added together, and the result should be written in the box under the **Total** column. Boxes in the same column should be added, and the sum written in the first row of the **Total** column of the second part of the Table.

PROTOCOL 46

CHARACTERISTICS OF HOME CARE FOR BRONCHIAL OBSTRUCTION SYNDROME AND ASTHMA IN CHILDREN

INTRODUCTION

With their high rate of incidence among children, acute respiratory infections are a frequent illness among children under 5 years. Even though they may be cause for concern in the family, the majority of ARI episodes are not serious and they are generally treated using general care measures that can be administered in the home. Because these episodes are so frequent and because they are likely to be treated at home, the majority of cases of ARI are treated by parents at home and are not seen in health services. Even though this procedure is an appropriate response to this disease, there are, however, certain problems.

ARI episodes can be severe and require treatment in health services. This treatment should be received as early as possible to prevent the infection from becoming more serious and leading to possible clinical complications. Failure to recognize and delayed identification of the signs indicating that an ARI should not be treated in the home creates a greater health risk for children.

Moreover, home remedies to treat ARI are not always in keeping with medical recommendations. Families have progressively incorporated the use of medicines based on previous experiences in managing the child's episode or those of other children either in the family or in the neighborhood or even on adults. This process has led to an increased use of unnecessary or inappropriate drugs, including antibiotics.

Improvements need to be made regarding the criteria for determining when a child with ARI should be taken to a health center and what treatment measures should be used in the home, in order to guarantee better health for children. Both aspects are particularly relevant in treating obstructive respiratory problems, which, in certain cases, occur with a high degree of frequency.

There is an additional factor influencing the treatment of Bronchial Obstruction Syndrome (BOS) in children under 5 years and the treatment of asthma in children over 5 years of age: the continued lack of uniformity in how health workers treat and diagnose both problems. Families often use drugs that are not recommended or the dose and frequency are inappropriate.

Knowledge of the care and attention provided in the home to children with BOS or asthma is therefore very important in promoting a more rational use of drugs by parents and the family and in improving the home remedies applied for both problems.

OBJECTIVE

To describe the characteristics of treating bronchial obstruction syndrome or asthma in the home

METHODOLOGY

To achieve the proposed objective, parents will be surveyed on the presence of BOS in children between 2 and 4 years of age and of children with asthma between 5 and 14 years of age, as well as on the type of treatment these children are being given in the home.

The parents will be questioned on:

- The presence of BOS in children between 2 and 4 years and of asthma in children between 5 and 14 years, based on the medical diagnosis of these problems; or on the presence of repeated wheezing episodes or who have been medicated with a bronchodilator, corticoid, or another drug for treating asthma or bronchiospasm.

- The drugs being administered to that child based on those clinical analyses including doses, frequency of use, and the amount of time the child has been taking them.

- Other types of treatment (i.e., not drugs) being administered to these children and that are home remedies, such as teas.

- The special care provided to these children because of their bronchial problems, including eating habits, cleaning, environmental contaminants, the presence of pets, play, etc.

- Smoking in the home.

- Any other form of treatment being applied or associated with the child's bronchial obstruction problems.

In all cases, the origin of the measure applied will be assessed to see if it is based on a medical recommendation, a recommendation of family or neighbors, a recommendation taken from written literature, etc.

Annex 46.A provides a sample interview form that could be a useful guide for formulating the corresponding questions. This form can be used during a home visit, in an interview outside of the home (at health centers), during a telephone survey or can be sent to the residence by mail or by children in schools and day-care centers.

The methods for determining sample size can be found in the Support Module on Statistical Methodology in Part II.

Data processing

Any computer program with database creation capabilities can be used. In this way, the analysis can be carried out based on different combinations of the variables obtained. If the information needs to be processed manually, Annex 46.B provides a data summary table for consolidating the

information taken from the survey forms. These can be used to calculate the indicators related to the treatment of BOS and asthma in the home. Table 46.1 provides a list of some indicators, which can be complemented with others considered to be of interest or importance or that stem from other variables incorporated into the study.

TABLE 46.1

INDICATOR	NUMERATOR	DENOMINATOR
Proportion of children between 2 and 4 years with BOS receiving daily treatment with bronchodilators	Number of children between 2 and 4 years with BOS being treated with a bronchodilator	Total number of children surveyed between 2 and 4 years with BOS
Proportion of children between 5 and 14 years with asthma being treated with an oral bronchodilator	Number of children between 5 and 14 years with asthma being treated with an oral bronchodilator	Total number of children surveyed between 5 and 14 years with asthma
Proportion of children between 2 and 4 years with BOS that are being treated with corticoids	Number of children between 2 and 4 years with BOS that are being treated with corticoids	Total number of children surveyed between 2 and 4 with BOS
Proportion of children between 5 and 14 years with asthma that are being treated with alternative drugs (homeopathic)	Number of children between 5 and 14 years with asthma that are being treated with alternative drugs (homeopathic)	Total number of children surveyed between 5 and 14 with asthma
Proportion of children between 5 and 14 years with asthma that are receiving vaccines	Number of children between 5 and 14 years with asthma that are receiving vaccines	Total number of children surveyed between 5 to 14 with asthma
Proportion of children between 5 and 14 years with asthma that are administered medicated vaporizations (2 or more per week)	Number of children between 5 and 14 years with asthma that are administered medicated vaporizations (2 or more per week)	Total number of children surveyed between 5 and 14 with asthma

ANNEX 46.A
HOME CARE FOR BOS AND ASTHMA IN CHILDREN

FORM FOR PARENT INTERVIEWS

Form Number: _____ Place and Date: _____

Is there a child between 2 and 14 years of age living in the home? Yes [__] No [__]			
Ask about history of bronchial obstruction syndrome (BOS), asthma or wheezing.			
Age of each child in years and months	Child 1: [____]	Child 2: [____]	Child 3: [____]
Has the child ever experienced wheezing (whistling respiration, bronchiospasm, fatigue)?	Never [_ __] 1 time [___] > 1 time [___]	Never [___] 1 time [___] > 1 time [___]	Never [___] 1 time [___] > 1 time [___]
If the child has experienced more than one wheezing episode, when did these episodes start (in years/months)?			
How many episodes has the child had in the last year?			
Has the child ever been treated with bronchodilators? (mention some common drug names)	Yes [__] No [__]	Yes [__] No [__]	Yes [__] No [__]
Has the child ever been hospitalized for respiratory disease?	Yes [__] No [__]	Yes [__] No [__]	Yes [__] No [__]
Do you recall why?			
Did the child have any wheezing episodes during as part of that disease?	Yes [__] No [__]	Yes [__] No [__]	Yes [__] No [__]
Was the child treated with bronchodilators during the disease? (orally, inhalation)	Yes [__] No [__] Does not know [_]	Yes [__] No [__] Does not know [_]	Yes [__] No [__] Does not know [_]
Was the child administered corticoids orally or by injection during the disease?	Yes [__] No [__] Does not know [_]	Yes [__] No [__] Does not know [_]	Yes [__] No [__] Does not know [_]

Was the child administered oxygen during the disease?	Yes [__] No [__] Does not know [_]	Yes [__] No [__] Does not know [_]	Yes [__] No [__] Does not know [_]
Do any of the children have bronchial obstruction syndrome?	Yes [__] No [__]	Yes [__] No [__]	Yes [__] No [__]
Do any of the children have asthma?	Yes [__] No [__]	Yes [__] No [__]	Yes [__] No [__]
Do any of the children receive permanent preventative treatment?	Yes [__] No [__]	Yes [__] No [__]	Yes [__] No [__]
What drugs, by what means (oral or inhalation) and in what dosage, are currently being used to treat the child with BOS and asthma?			
What drugs, by what means (oral or inhalation) and in what dosage, have been previously used to treat the child with BOS and asthma?			
What other treatment (not drugs) is the child with BOS or asthma receiving?			
Is a vaporizer used for the child?	Yes [__] No [__]	Yes [__] No [__]	Yes [__] No [__]
Is some drug added to the vaporizer?	Yes [__] No [__] [_____]	Yes [__] No [__] [_____]	Yes [__] No [__] [_____]
Is the child receiving any special vaccines?	Yes [__] No [__]	Yes [__] No [__]	Yes [__] No [__]
Who administered this treatment to the child?			
Observations:			

ANNEX 46.B

HOME CARE FOR BOS AND ASTHMA IN CHILDREN
DATA SUMMARY TABLE

VARIABLE	TOTAL	YES	NO	NO INFORMATION
Children between 2 and 4 years with BOS being treated with a bronchodilator				
Children between 5 and 14 years with asthma being treated with an oral bronchodilator				
Children between 2 and 4 years with BOS being treated with corticoids				
Children between 5 and 14 years with asthma receiving preventative drug treatment				
Children between 5 and 14 years with asthma being treated with alternative drugs (homeopathic)				
Children between 5 and 14 years with asthma receiving vaccines				
Children between 5 and 14 years with asthma who use a vaporizer with medication two or more time per week				
Children between 2 and 4 years that are receiving asthma medication that has not been recommended				

Observations:

Instructions for completing the data summary table

The data summary table can be used to consolidate information obtained from interviews with parents who have children between 2 and 14 years, if data are being consolidated manually. The following procedure should be used to complete the data summary table:

1. Decide whether the information will be processed as a whole or whether certain groups will be studied. For example, it could be of interest to study different age groups, such as children between 5 and 9 years of age and children between 10 and 14, or to analyze boys and girls separately. Other variables may have also been included in the interview, such as the type of medical coverage (public, private, and social security). Thus, it may be worthwhile to disaggregate the total number of interview forms with regard to the variables.

2. Prepare a data summary table for every group taken from the total number of survey forms, and identify the group in the upper part of the table (for example, children between 5 and 9 years or private medical care coverage). The variable should have been clearly defined previously.

3. Starting with the first survey form, determine to which group the form belongs. The forms that include information for more than one child may belong to different groups. For example, if the files are to be separated by age group, two children on a single form may have to be included in different data summary forms.

4. Read the first aspect on the data summary table and look for the response on the survey form. Place the response in the corresponding box in the data summary table, marking (I) in the **Total** column and one of the three following boxes: **Yes** if the response is affirmative; **No** if the response is negative; and **No Information** if no information on this aspect is included on the survey form (either because the question was not asked or because the person being interviewed did not know.)

5. Do the same with the next aspect in the following row. Take from the form all the aspects to be included in the data summary table, including those that were added into the survey form.

6. Once all the surveys have been recorded for each of the classifications the study group was divided into, add the marks (I) in each box and check that the sum of the **Yes, No,** and **No Information** boxes of every row coincides with the **Total** box.

7. When calculating the percentages of positive and negative responses for each aspect, the sum of the marks in the **No Information** box should be subtracted from the **Total** box for each aspect.

PROTOCOL 47

CHARACTERISTICS OF CARE PROVIDED IN THE HOME TO CHILDREN BORN AT HOME

INTRODUCTION

The health of children under 5 years basically depends on the care parents provide them in the home. Food and protection from external factors (weather, accidents), as well as being alert to any unusual behavior pattern, are essential for preventing disease. Of equal importance is early detection of any sign of disease and having available the most appropriate treatment. Periodic monitoring of children by health workers and specific preventative measures, such as vaccination, are also especially important in reducing the occurrence and seriousness of childhood diseases.

Since children are essentially dependent, it will always be adults who make decisions on how they are fed and clothed and on the general status of their health. These adults will be the ones who will determine whether children are *healthy* or *sick* by observing their behavior. They will also be the ones who decide at what point a child's illness causes sufficient concern and leads to seeking health care outside of the home. Detecting patterns of inappropriate health prevention and promotion for children is important for identifying families where small children are at the greatest risk.

Lack of prenatal care associated with children born in the home can be a useful variable for identifying at-risk families. This holds particularly true given that a lack of care during pregnancy and birth can be associated with a lesser degree of concern over prevention and health protection for children. This association could result in the child receiving inadequate care in the home reflected in the lack of preventative and protection measures, as well as delayed perception of early signs of disease requiring health care.

OBJECTIVE

To learn about the characteristics of care in the home for children born at home.

METHODOLOGY

To meet the objectives of the study, a household survey will be administered to mothers or to the person responsible for caring for children under 5 years of age in the area specified in the study. First, the area under study and the number of children under 5 years living in that area, including those born at home, has to be determined. Since information on births in the home is not always readily available, it could be helpful to contact community and religious leaders, as well as district authorities that may have this information.

A survey will be made of mothers or the person responsible for caring for children regarding the prenatal care, the care of the child in the home, and the general characteristics of the home.

The study group should be divided into groups according to where the child was born in order to draw comparisons among the characteristics of care in the home for children born in an institu-

tion or in the home. For a more detailed analysis, it is recommended that groups be divided by place of birth (institution or home) and then subdivided according to the prenatal care received: no prenatal care; inadequate prenatal care; and good prenatal care. This would be based on the number of prenatal checkups (none, 1 to 4, 5 or more) or on established standards for good prenatal care. It should be borne in mind that this makes the study and subsequent analysis more complex.

While different study subgroups can be formed, analysis for four defined groups is recommended.

- women who gave birth at home and did not receive prenatal care
- women who gave birth at home and received prenatal care
- women who gave birth in an institution and did not receive prenatal care
- women who gave birth in an institution and received prenatal care

Comparison of the characteristics of the children in the four groups will be descriptive. However, if an association study is being carried out, a pilot should be implemented to estimate the prevalence of the variables to be studied in order to calculate the size of the sample needed. A comparison could be proposed between the highest risk group (women who gave birth at home and did not receive prenatal care) and the lowest risk group (women who gave birth in an institution and received adequate prenatal care.) The methods for determining sample size are described in the section on estimate studies in the Statistical Methodology Support Module in Part II.

Annex 47.A includes a sample survey form for gathering information. The variables included on the form should be revised based on the characteristics of the area and the study group. Other variables can be incorporated into the form, as deemed necessary.

To process the data gathered from the survey forms, it is recommended that this information be entered into a database program like Epi Info, for example. Data can also be manually processed by preparing a data summary table, such as the one in Annex 47.B. Additional variables considered of interest can be incorporated. A data summary table should be created for each group to be studied, if the total group has been subdivided by certain variables of interest.

Table 47.1 presents some indicators as an example. Other relationships could also be calculated based on the information included in the data summary table. Using the indicators in the table as an example, as many others can be created as stem from the variables included in the interview form.

TABLE 47.1

INDICATOR	NUMERATOR	DENOMINATOR
Proportion of children under 5 born at home with an incomplete vaccination record for that age	Number of children under 5 born at home with an incomplete vaccination record for that age	Total number of children under 5 born at home
Proportion of children born at home who were breastfed until 6 months of age	Number of children born at home who were breastfed until 6 months of age	Total number of children born at home

ANNEX 47.A
CARE IN THE HOME OF CHILDREN BORN AT HOME

INTERVIEW FORM FOR THE MOTHER

Identification data:					
Surname and name of the child:					
Date of Birth: ____/____/____ Sex: [____]					
Surname and name of the mother:					
Residence of the child:					
Date of the interview: _____/_____/_____					
Family unit					
Father	Yes [__] No [__]	Age [ ]	Grand-mother	Yes [_] No [_]	Siblings Yes [__] No [__]
Mother	Yes [__] No [__]	Age [ ]	Grand-father	Yes [_] No [_]	- Older No. [_____]
Others: [_____]					- Younger No. [_____]
Education of the mother:	Primary [__] Years [___]	Secondary [__] Years [___]	Advanced [___]		
Education of the father:	Primary [__] Years [___]	Secondary [__] Years [___]	Advanced [___]		
Education of the person who took					
care of the child	Primary [__] Years [___]	Secondary [__] Years [___]	Advanced [___]		
Characteristics of the home					
Urban [___]	Rural [___]	Number of rooms: [___]	Running water: Yes [__] No [__]		
Bath:	Yes [__] No [__]	Latrine: Yes [___] No [___]			
Eating area:	Yes [__] No [__]	No. of people who sleep in one room: [_____]			
		No. of people who sleep with the child: [_____]			
Prenatal care related to the birth of the child					
Prenatal check-up	Yes [__] No [__]	Health Center [___]	Hospital [___]		
Other:					
Has the Prenatal Card	Yes [__] No [__]	First visit before 20 weeks gestation: Yes [__] No [__]			
No. of visits: [_____]					
On delivery					
Where did the delivery take place?	Hospital [ ]	Residence [ ]	Other		
Why did the delivery take place at home?					
How many deliveries have taken place in the home [ ]					
Who attended the delivery?					
Physician [ ]	Nurse [ ]	Obstetrician [ ]	Health worker [ ]	Midwife [ ]	
Other					
How long did labor last? [ ] hours					
Who was present during labor?	Husband [ ]	Mother [ ]	Others [ ]		
Did the child cry immediately?	Yes [__] No [__]				
Did you go to the hospital after the delivery?	Yes [__] No [__]				
How much time later?	[ ] hours	] days			
On the birth of the child and feeding at birth					
Was the child with you since was it born?	Yes [__] No [__]				
Was the child breastfed?	Yes [__] No [__]				

When was the first time the child was breastfed?			
For how long did the child exclusively breastfeed? [____]			
Was something given to the child before breastfeeding? Yes [__] No [__]			
What was given to the child?			
Did you give something else to the child in addition to breast milk? Yes [__] No [__]			
If you gave the child something else, what was it?			
When was the first time you took the child for a checkup?			
How much did the child weigh? [ ]			
To whom did you take the child? Health services [__] Healer [__] Other:			
When the child was taken to the health services, to what service was the child taken			
(name and address of the service)?			
Does the child have a vaccination card? Yes [__] No [__]			
Vaccines up to date? Yes [__] No [__]			
Does the child have a growth monitoring card? Yes [__] No [__]			
Monitoring up to date? Yes [__] No [__]			
On diseases in the child Has the child been			
sick in the last 6 months?	Episode 1: [__]	Episode 2: [__]	Episode 3: [__]
	Age [_____]	Age [_____]	Age [_____]
What did the child have?			
How was the child treated?			
Was care sought outside of the home?	Yes [__] No [__]	Yes [__] No [__]	Yes [__] No [__]
Healer, other	Yes [__] No [__]	Yes [__] No [__]	Yes [__] No [__]
Health Post	Yes [__] No [__]	Yes [__] No [__]	Yes [__] No [__]
Health Center	Yes [__] No [__]	Yes [__] No [__]	Yes [__] No [__]
Hospital	Yes [__] No [__]	Yes [__] No [__]	Yes [__] No [__]
Other:	Yes [__] No [__]	Yes [__] No [__]	Yes [__] No [__]
What did they say the child had?			
Family dynamic and care of the child			
Work Father Yes [__] No [__] Outside the home? Yes [__] No [__] Hours			
Mother Yes [__] No [__] Outside the home? Yes [__] No [__] Hours			
Do you have sufficient time to look after the child? Yes [__] No [__]			
Why?			

	Who is in the home?	Who takes care of the child?	Who feeds the child?
Morning			
Noon			
Afternoon			
Night			

Access to health service:
Is the health service less than one hour from the home? Yes [__] No [__]
On public transportation [_____] On foot [_____] On horse/mule [_____]
Other (specify)
Are there economic costs in traveling to and receiving care from the health service? Yes [__] No [__]
Are these economic costs accessible to the population? Yes [__] No [__]
Observations:

ANNEX 47.B
CARE IN THE HOME OF CHILDREN BORN AT HOME

DATA SUMMARY TABLE

Health Service/Area:_____ Period: _____ Study Group: _____

VARIABLE	TOTAL	YES	NO	NO INFORMATION
Child exclusively breastfed up to 4 or 6 months of age				
Child has a complete vaccination record for his age				
Child has periodic checkups				
Child has had diseases related to IMCI in the last 6 months				
The mother took the child for a medical visit during the last 6 months				

Observations:

Instructions for completing the data summary table

1. A data summary table should be prepared for each subdivision of the group according to where the delivery took place and the prenatal care received. For example, women could be separated into the following groups:

    - women who gave birth at home and did not receive prenatal care
    - women who gave birth at home and received prenatal care
    - women who gave birth at an institution and did not receive prenatal care
    - women who gave birth in an institution and did receive prenatal care

2. The survey forms should be separated into the same number of groups as data summary tables have been prepared.

3. Select one of the data summary tables and the set of forms corresponding to it. Starting with the first form, find the information related to each of the aspects to be evaluated and mark the corresponding column. For example, if the child does not have a complete vaccination record for his age, a mark should be made in the **Yes** column, otherwise, the mark should be made in the **No** column. If information on this or another aspect is not available, the **No Information** column should be marked.

4. Once all the rows of the data summary table have been completed for the first survey form, carry out the same procedure for the second form and so and so forth, until all the forms have been incorporated into the corresponding data summary table.

5. Repeat the procedure for all the data summary tables defined for data processing.

6. Once all the information from the survey forms has been completed, the marks in each box of the data summary table should be added, and the sums noted in the boxes of a single row to obtain the **Total.**

PROTOCOL 48

FREQUENCY AND CHARACTERISTICS OF CONSULTATIONS FOR CHILDREN UNDER 1 MONTH OF AGE

INTRODUCTION

Children under 5 years account for the majority of visits to health services. However, there are differences in the distribution and frequency of these visits in terms of age and place. Variations in the frequency of visits according to age are associated with the greater susceptibility of children to disease. During the first year of life, emphasis is on applying prevention measures and the early detection of problems, meaning that children will have to be taken to a health facility to be vaccinated and have their nutrition, growth, and development checked.

The frequency with which children are taken to a health facility varies according to place and is different in different countries. This situation is partially influenced by the population's concepts and beliefs about respect for the health and care of children in general and of breastfeeding children in particular. This frequency also depends on how health services are organized, since in many locations, care for children under one month old is only carried out in certain services and by health workers with a certain degree of specialization.

It is very important to know about the health care provided for diseases and health problems in children under one month old because a significant number of deaths occurs at that age. Although the majority of these deaths is related to the care provided during birth and to the newborn, early medical attention from a specialized health service or worker can result in better care and prevent death or possible complications.

Moreover, many or even the majority of the diseases and health problems of children under one month old are not directly related to being born, but rather to being exposed to the outside environment. Since these children are so vulnerable, parents need to be especially aware of the early signs of disease, and health workers need to be able to provide appropriate care to the children in this age group brought by their parents to health facilities in search of assistance.

The Integrated Management of Childhood Illness strategy encompasses prevention, early diagnosis, and appropriate treatment for health problems in children under 5 years, beginning from the first week of life. This strategy is not applied to problems associated with the birth or delivery of the newborn. Not only does the strategy address the knowledge and practices health workers should have to provide appropriate care, but it also focuses on the knowledge and practices of parents in providing better care to children in the home. Therefore, the IMCI strategy is a sound tool for improving the quality of care provided to children under 5 years, including children under one month old.

OBJECTIVES

- To discover what proportion children under one month represent out of all medical visits among children under 5 years

- To learn about the frequency and characteristics of care sought outside of the home for children under one month old

METHODOLOGY

Two activities will be carried out to achieve the proposed objectives:

- A survey of parents on the care given to children under one month old and on patterns for seeking care outside of the home

- A review of outpatient medical records to determine what proportion children under month represent out of all medical visits among children under 5 years

The methods for determining sample size are described in the section on estimate studies in the Statistical Methodology Support Module in Part II.

Survey of parents

- Parents with children under one month old will be consulted on:

- Whether the child has had some health problem during the first month of life.

- Whether someone saw the child about this health problem or to check the child's general health during the first month of life.

- If so, who was that person? Where did it take place? How old was the child? Why was the child taken there? What indications did this person give? What did the parents do?

- The care of the child in the home: person responsible; food, shelter; protection from danger, etc.

The parents to be surveyed can be selected based on information from maternity wards. All the children selected should be older than one month, but not older than four to six months to avoid cases where information about the first month of life may have been forgotten. Ideally, children between one and two months should be selected.

If parents are selected based on maternity records, children who were hospitalized after being born should not be included because the pattern of medical visits during the first week will not be able to be evaluated.

Selection based on maternity records makes it impossible to reach the parents whose children were born at home (non-institutional births.) Since this group faces the greatest risks, alternatives

should be sought for identifying them. It would be useful to contact community workers, religious leaders, district authorities, etc. who might have information about children recently born. Another method would be to identify women in their last month of pregnancy in order to interview them a few months later.

Annex 48.A provides a sample interview form that can serve as a useful guide for drafting the corresponding questions. This form can be used during a home visit, an interview outside of the home, a telephone interview or can be sent to the home by mail or through children at schools and day-care centers.

Data can be processed using any computer program that can create databases. In this way, analysis can be carried out based on different combinations of the variables obtained.

If the information needs to be processed manually, Annex 48.B provides a data summary table for consolidating the survey forms, which can be used to calculate indicators on the problems being studied.

Review of medical records

Reviewing medical records will make it possible to learn what proportion of children under one month old received pediatric care at a health center. This information can be broken down by week of life. Thus, records from all health services providing care to children under one month need to be reviewed, including both health centers and hospitals. In the latter case, this would encompass outpatient and emergency room records, as well as other specialized services. This may vary according to place because visits for children under one month can only be treated in the neonatal ward of the hospital. If the hospital and this service are not included in the review of the records, a sizeable amount of medical visit information will be lost, and the proportion that visits of children under one month represent out of the total number of visits will be underestimated.

The following health service records should be reviewed:

- Daily outpatient records and clinical histories or visit forms. If the records of community workers (community health agents or other volunteers) are to be reviewed, these should also be included.

- Hospitalization records, such as treatment logs, clinical histories of hospitalization, etc. because some children under one month may be treated directly in hospital rooms, without being recorded in the outpatient records of hospitals.

In order to make use of these information sources, the conditions for appropriate recording should be met, particularly with regard to data related to the diagnosis, treatment, and age of the child. The last should be detailed enough so as to classify children under one month by their ages in weeks.

It should be borne in mind that the study cannot be conducted if the records are deficient in terms of the variable to be studied. If, for example, the age of the child is not listed in days (8 days, 18 days) or in weeks (1 week, 3 and a half weeks), it will not be possible to determine the proportion of visits of children under one week, which is a very important factor.

Annex 48.C is a data summary table that can be completed based on the review of health service records.

Based on the information obtained indicators can be calculated regarding the proportion of medical visits among children under one month old, differentiating within that group by weeks of life. The major causes for these visits can also be examined for this age group, as can the indications of health workers, and patterns among care given in the home. Table 48.1 provides certain indicators that can be calculated based on the information obtained. They can be adapted or expanded if necessary.

TABLE 48.1

INDICATOR	NUMERATOR	DENOMINATOR
Proportion of medical visits among children under 1 month compared with that of the total number of children under 5 years	Number of children under 1 month receiving care	Total number of children under 5 years receiving care
Proportion of medical visits of children under 1 week old compared with that of the total number of children under 5 years	Number of children under 1 week receiving care	Total number of children under 5 years receiving care
Proportion of children whose parents sought care outside the home because of a health problem during the first week of life	Number of children whose parents sought care outside the home because of a health problem during the first week of life	Total number of children whose parents were interviewed to evaluate the use of care outside the home during the first month of life
Proportion of parents who do not believe that the child should be taken outside the home during the first week of life	Number of parents who do not believe that the child should be taken outside the home during its first week of life	Total number of parents interviewed to evaluate the care of the child during the first month of life
Proportion of children who did not need to be seen for a health problem during the first two weeks of life	Number of children under 2 weeks old whose parents did not observe any health problem for which the child had to seen outside of the home	Total number of children less than 2 weeks old whose parents were interviewed to evaluate the child's state of health during the first month of life

ANNEX 48.A
FREQUENCY AND CHARACTERISTICS OF CONSULTATIONS FOR CHILDREN UNDER 1 MONTH OF AGE

SURVEY FORM FOR PARENTS WITH CHILDREN UNDER 1 MONTH

Number of File: _____ Place and Date: _____

Identification data:			
Surname and name of the mother:			
Date of delivery: _____/_____/_____			
Discharge date: _____/_____/_____			
Surname and name of the newborn:			
Normal condition at birth: Yes [__] No [__] Birthweight: [_____] Weight at discharge: [_____]			
Date of discharge of the child: ____/____/____			
Exclusive breast-feeding at discharge: Yes [__] No [__]			
Residence:			
Who took care of the child during the first month? [_____]			
No. of previous children [____]			
Disease episodes before one month of age:	Episode 1: [__]	Episode 2: [__]	Episode 3: [__]
Was the child sick on some occasion during			
the first month of life? (age in days)	Yes [__] No [__]	Yes [__] No [__]	Yes [__] No [__]
	Age [_____]	Age [_____]	Age [_____]
What did the child have?			
What was done to treat the child?			
Was care sought from someone			
outside the home?	Yes [__] No [__]	Yes [__] No [__]	Yes [__] No [__]
Healer, other	Yes [__] No [__]	Yes [__] No [__]	Yes [__] No [__]
Health Post	Yes [__] No [__]	Yes [__] No [__]	Yes [__] No [__]
Health Center	Yes [__] No [__]	Yes [__] No [__]	Yes [__] No [__]
Hospital	Yes [__] No [__]	Yes [__] No [__]	Yes [__] No [__]
Other _____	Yes [__] No [__]	Yes [__] No [__]	Yes [__] No [__]
What did they tell you the child had?			
Do you think it is not advisable to seek care			
outside the home for children under 1 month,			
even when they are sick? Yes [__] No [__]			
Why?			
Observations:			

ANEXO 48.B
FRECUENCIA Y CARACTERISTICAS DE LA CONSULTA DE NIÑOS MENORES DE 1 MES

CUADRO DE CONSOLIDACION DE LA INFORMACION DE LAS ENTREVISTAS A LOS PADRES

ASPECTO	TOTAL	SI	NO	SIN INFORMACION
Niños que tuvieron por lo menos un episodio de enfermedad durante su primer mes de vida, con base en la entrevista a los padres				
Niños que tuvieron por lo menos un episodio de enfermedad durante su primera semana de vida, con base en la entrevista a los padres				
Niños que fueron vistos por alguien fuera de la familia a causa de un episodio de enfermedad durante su primera semana de vida				
Niños que fueron llevados por sus padres a un servicio de salud a causa de un episodio de enfermedad durante su primera semana de vida				
Padres que no consideran conveniente que el niño sea llevado fuera del hogar durante su primer mes de vida				
Niños que tuvieron un episodio de IRA durante su primer mes de vida				
Niños que tuvieron diarrea durante su primer mes de vida				

Observaciones:

ANNEX 48.C

FREQUENCY AND CHARACTERISTICS OF CONSULTATIONS FOR CHILDREN UNDER 1 MONTH OF AGE

DATA SUMMARY TABLE OF INFORMATION TAKEN FROM MEDICAL RECORDS

CLASSIFICATION	TOTAL	ILLNESSES ADDRESSED BY THE IMCI STRATEGY	OTHER ILLNESSES	UNSPECIFIED
TOTAL				
< 1 WEEK				
1 WEEK				
2 WEEKS				
3 WEEKS				
1 MONTH				
2 A 11 MONTHS				
1 A 4 YEARS				
UNSPECIFIED				

Observatioes:

Instructions for completing the data summary tables

Information from parent interview forms

This table can be used to consolidate information taken from interviews with parents regarding the occurrence of disease episodes and the treatment of them during the first month of life.

1. Decide whether the information will be processed jointly or separated into specific groups. For example, a separate analysis could be of interest about the occurrence of disease episodes and the behavior of parents during the first month of life according to the sex of the children or other variables included in the interview (monthly income, level of education of parents, etc.)

2. Prepare a data summary table for each group of the total forms and identify the group in the upper corner of the table. Examples could include: 'female sex' and 'both parents with a completed secondary education.' The definition of variables should be specified clearly beforehand.

3. Take the first survey form and decide in which data summary table that information should be recorded. One form may contain information for more than one table. For example, if the forms are separated by sex and by education level of the parents, each form will be included in two data summary tables.

4. Read the first aspect of the data summary table and look for the response on the interview form. Incorporate the response in the corresponding data summary table by making a mark (I) in the box in the **Total** column and then in one of the three following boxes: **Yes,** if the response is affirmative; **No** if the response is negative; and **No Information** if the form does not include information on that aspect (either because the question was not asked or the interviewee did not know the answer or did not want to answer).

5. Use the same procedure for the aspect in the following row. Complete the form for all the aspects included in the data summary table. The table in Annex 48.B includes only certain aspects as examples, but many others can be included based on the interview form. Complete the aspects to be included before proceeding to the following form.

6. Once all the interview forms have been completed for each of the groups established, add the marks (I) in each box and verify that the sum of all the categories (**Yes, No,** and **No Information**) coincides with the **Total.**

7. After calculating the percentages of affirmative and negative responses for each aspect, the sum of the **No Information** category should be subtracted from the corresponding **Total.**

Information on health service records

This table can be used to consolidate information from outpatient and hospitalization records of the health services where the frequency of medical visits among children under one month old has been studied.

1. Fill in the upper part of the data summary table with data about the health service and period during which the problem was studied. Specify clearly if it is an outpatient or hospital service. In the latter case, specify the hospital service: pediatrics; neonatology, external consult, emergency room, etc.

2. Complete the information about the study group. For example, if the frequency of medical visits among boys and girls is to be studied separately, a different data summary table should be completed for each service.

3. Examine the record from the corresponding health service, starting with the first day of the period to be studied and review it until finding a visit or hospitalization (as appropriate) that applies to a child under 5.

4. Select the data summary table corresponding to the information found, according to the subdivisions of the study—sex of the child, for example.

5. Find in the data summary table chosen the row corresponding to the age of the child and make a mark (I) in the **Total** column of that row.

6. Observe the diagnosis given to the child. If it corresponds to one of the diseases subject to the IMCI strategy, make a mark (I) in the **IMCI** column. Otherwise, make a mark in the **Other Diseases** column. If there is no information about the diagnosis, make a mark (I) in the **No Information about the Diagnosis** column.

7. Continue with the following visit and carry out the same procedure.

8. Once the corresponding health service records have been reviewed for the time period selected, add all the marks (I) in each box and write the sum in that box. Then add the boxes of each row and note the total in the box of the corresponding column. Add the numbers of boxes of each column and record the total in the box of the corresponding row.

PROTOCOL 49

CHARACTERISTICS OF CARE FOR CHILDREN WITH FEBRILE ILLNESS

INTRODUCTION

Fever is one of the most frequent reasons for pediatric medical visits because fever has been recognized as one of the most important signs of disease, particularly by the relatives of the child.

When fever is the object of medical visits, the causes can be either infectious or noninfectious, including dehydration, injuries, and neoplasms. With regard to the former, the fever may be caused by numerous etiologies, varying according to age and the pathologies present in the region.

The initial evaluation of the child with fever is very important because although fever can correspond to benign febrile illness, it can also be related to serious diseases. For this reason, it is very important that the criteria for assessing febrile illness in a child include not only evident signs of severity (for example comatose state, lethargy or unconsciousness), but also other indications of a disease requiring hospital treatment or the administration of specific drugs on an outpatient basis.

Moreover, treatment criteria (type of drugs, forms of administration, dosage and duration of treatment) are not uniform.

Knowledge about the criteria used in primary care health services as well as in external consults at hospitals can provide a general overview of how children with fever are cared for and can serve as a foundation for evaluating the changes produced if inappropriate curative measures are applied.

OBJECTIVE

To describe the characteristics of the treatment health services provide to children with fever.

METHODOLOGY

This research can be applied to those health services where the IMCI strategy is not yet being enforced. In this case, knowledge about the criteria presently used can help identify those aspects that should be emphasized in implementing the IMCI strategy. In cases where the strategy is being applied, this protocol can help evaluate the compliance of health services.

The study group will be health workers providing outpatient care to children under 5 years. The criteria these health workers use to treat children with fever will be evaluated in terms of the final diagnosis and the type and means of treatment prescribed in these cases.

The methods for determining sample size are described in the section on estimate studies in the Statistical Methodology Support Module in Part II.

The study should encompass a revision of the clinical histories of records of children under 5 years who were diagnosed by a health service where the health workers being studied work.

This will consist of a retrospective evaluation of cases of children with fever, and the following should be analyzed:

- Reason for visit
- Duration and degree of fever
- Other signs and symptoms the child presented
- Tests conducted and their results
- Diagnosis issued by health workers
- Treatment prescribed and how that treatment was or has been administered

Good records of this information are needed; otherwise it will be impossible to determine whether some symptoms are absent because they were not present in the first place or because the health worker did not assess them.

The records used (clinical histories or outpatient forms, for example) should contain information about the visit, particularly about referrals to a hospital and whether this referral was for hospitalization or for exams to make a diagnosis.

If adequate records are not available, a special registry should be utilized during execution of the study in order to obtain the necessary information. The review of the available information will reflect to a great extent the criteria that health workers apply in practice.

Annex 49.A provides a form for gathering data that can be used to review the cases of children under 5 years with fever. This form can be adapted according to where the study is conducted.

If records are available, the form for gathering data can be modified to record fever cases that consulted health services.

Procedures for implementing the study

1. Select the health workers or services to be included in the study.

2. Define the period of time when the study will be conducted. Since medical visits for fever are common, efforts should be made to gather information on a sufficient number of cases.

3. Define the variables that will be included in the study to learn about case management criteria. Review the data collection form in Annex 49.A and adapt it as necessary. If a standard already exists for treating children and the goal is to evaluate to what extent the health services being studied have achieved that standard, all the variables for that standard should be included on the data collection form.

4. Select the records corresponding to health care for children under 5 years. Once fever cases have been identified, review the records and complete a form for each record.

5. Information not found in the case record should be indicated for each variable in the **No Information** box.

6. Once the record of all cases for all the health services selected have been completed then begin processing the data.

Data processing

A database computer program like Epi Info can be used to process the data or it can be processed manually for certain variables using the data summary table found in Annex 49.B.

Once the information from all the health services has been consolidated, various indicators can be calculated about the criteria for diagnosing and treating children under 5 years with fever. Table 49.1 includes some examples of indicators. The indicators in the table can be used to develop other indicators taken from interview forms.

It should be borne in mind that if there is no information for a very high proportion of cases (40% of more), the calculation of the indicators will not be representative of the total because a high number of cases had no information about the variable being studied.

If the goal is to compare changes in the criteria of health workers for evaluating, diagnosing, and treating children under 5 years with fever, the same indicators should be compared during two different time periods. In this case, a reduction in the percentage of cases where no information is available will help improve the record, making it possible to carry out a better analysis of the criteria being used.

If the goal is to evaluate to what extent the diagnosis and treatment criteria established by standards are being applied, these standards should be clearly defined and, in revising the records, it should be determined which cases do and not comply with these standards.

TABLE 49.1

INDICATOR	NUMERATOR	DENOMINATOR
Proportion of children under 5 years with fever and some other warning of danger	Number of children under 5 years with fever and some other warning sign present at the medical visit	Total number of children under 5 years with fever who received medical care during the period being studied
Proportion of children under 5 years with a definitive diagnosis of fever	Number of children under 5 years given a definitive diagnosis of fever	Total number of children under 5 years with fever who visited health services during the period being studied
Proportion of children under 5 years with fever and some warning sign who were referred to a hospital	Number of cases of children under 5 years with fever and some warning sign who were referred the hospital	Total number of children under 5 years with fever that consulted health services during the period being studied

ANNEX 49.A
CHARACTERISTICS OF CARE FOR CHILDREN WITH FEBRILE ILLNESS

DATA COLLECTION FORM

Number of File: _____ Place and Date: _____

Identification data of the child:		
Surname and name of the child:		
Age: [____] Sex: [____] Date of medical visit/hospitalization: ____/____/____		
Reason for visit Fever: [____] Other:_____		
Main Classification/Diagnosis:		
Other Classifications/Diagnoses:		
Residence of the child:		
Clinical Overview at the Time of the Consultation		
Fever:	[_____]°C	No Information [__]
Time: [_____]	[_____] Days	No Information [__]
Cannot drink or eat well	Yes [__] No [___]	No Information [__]
Vomits up everything	Yes [__] No [___]	No Information [__]
Convulsions	Yes [__] No [___]	No Information [__]
Lethargic or comatose	Yes [__] No [___]	No Information [__]
Subcostal indrawing	Yes [__] No [___]	No Information [__]
Stridor	Yes [__] No [___]	No Information [__]
Cough	Yes [__] No [___]	No Information [__]
Runny Nose	Yes [__] No [___]	No Information [__]
Eruption	Yes [__] No [___]	No Information [__]
Generalized Eruption	Yes [__] No [___]	No Information [__]
Stiff neck	Yes [__] No [___]	No Information [__]
Headache	Yes [__] No [___]	No Information [__]
Fast breathing	Yes [__] No [___]	No Information [__]
Pain when urinating	Yes [__] No [___]	No Information [__]
Earache	Yes [__] No [___]	No Information [__]
Joint pain	Yes [__] No [___]	No Information [__]
Anemia	Yes [__] No [___]	No Information [__]
Sepsis in the skin - cellulitis or pustules on the skin	Yes [__] No [___]	No Information [__]
Conjunctivitis	Yes [__] No [___]	No Information [__]
Diarrhea	Yes [__] No [___]	No Information [__]
Malnutrition	Yes [__] No [___]	No Information [__]
Others:_____		
Does the child have a vaccination card?	Yes [__] No [___]	
Vaccines current?	Yes [__] No [___]	
The region is endemic for: Malaria Yes [ ] No [ ] Dengue Yes [ ] No [ ]		
Other: _____		

Reference for:		
Hospitalization	Yes [__] No [___]	No Information [__]
Laboratory studies	Yes [__] No [___]	No Information [__]
Radiological examination	Yes [__] No [___]	No Information [__]
Treatment of the case		
Drugs	*Daily Dosage*	*Duration*
Other Treatments:		
Recommendations to the mother of the child:		
Diagnostic tests (for hospitals):		
Blood test for malaria	Yes [__] No [___]	No Information [__]
Blood count and cell morphology	Yes [__] No [___]	No Information [__]
Urinalysis	Yes [__] No [___]	No Information [__]
Mantoux Test	Yes [__] No [___]	No Information [__]
Hemoculture	Yes [__] No [___]	No Information [__]
Lumbar puncture	Yes [__] No [___]	No Information [__]
HIV/AIDS tests	Yes [__] No [___]	No Information [__]
Chest X-ray	Yes [__] No [___]	No Information [__]
Observations:		

ANNEX 49.B
CHARACTERISTICS OF HEALTH CARE FOR CHILDREN WITH FEBRILE ILLNESS

DATA SUMMARY SHEET

Health Services/Area: _____ Period: _____

VARIABLE	TOTAL	YES	NO	NO INFORMATION
Children with fever who show some warning sign				
Children definitively diagnosed with fever				
Children with fever and some warning sign that were referred for hospitalization				
Children with fever that were referred for laboratory examinations				
Children with fever that received indications for care in the home				
Children with fever for more than 7 days that were referred to the hospital				

Observaciones:

Instructions for completing the data summary table

The first column of the data summary table provides some information on the variables that can be studied. These can be modified to fit the needs of the study. Proceed as follows to complete the information in the data summary table:

1. Determine whether the forms will be processed jointly or separately according to some variable. For example, it may be of interest to learn about the diagnosis and treatment criteria by health service. In this case, a data summary table should be created for each health service. In selecting the groupings, the number of resulting forms in each group should be taken into account. If this number is very low, it will not be worthwhile to analyze the information separately.

2. Determine which aspects of the study will be taken into account in analyzing case management of children in health services. In the first column of the data summary table, certain aspects are presented that could be considered of interest. These can be modified and complemented with other aspects. Adjust the data summary table and incorporate all the aspects considered important for inclusion in the study.

3. Prepare a data summary table for each service included in the study, if the goal is to obtain a description of the case management criteria by health service for children under 5 years with fever. If another type of grouping is to be used, a data summary table should be constructed according to the variables to be studied.

4. Separate the forms into the groups to be studied. For example, if the results are to be broken down by heath service, a data summary table should be prepared for each health service.

5. Begin with the forms corresponding to each grouping and first write in the health service data and study period in the upper part of the table.

6. Read each aspect or variable in the first column of the data summary table and look for that information in the first form of the group.

7. For each aspect or variable, make a mark (|) in the corresponding column: in the third column if the answer is **Yes**; in the fourth column if the answer is **No;** and in the fifth column, **No Information,** if no information was available on that aspect.

8. Once all the forms of the groups corresponding to the data summary table have been completed, add the marks in each box, and write the sum in the same box.

9. Add the numbers in the boxes of each row and right the sum in the corresponding box of the **Total** column (second column).

10. Continue with another grouping to complete the data summary table according to these directions.

PROTOCOL 50

PREVALENCE AND CHARACTERISTICS OF INJURIES IN CHILDREN UNDER 5 YEARS OF AGE

INTRODUCTION

Injuries in children are a public health problem in both developed and developing countries. Injuries are generally classified as unintentional or intentional. **Unintentional** injuries are events that are not purposely initiated such as motor vehicle crashes, drowning etc. Injuries are **not** accidents. Injuries are predictable and preventable. The word accident connotes an idea that we have no control over our fate or action. **Intentional** injuries are events that are purposely initiated such as suicidal or homicide. Injuries account for a major proportion of deaths in young children- 20% of mortality in children ages 1 to 4.

However, the number of fatalities does not fully reflect the scope of the problem posed by injuries, since there are an estimated 200 to 1,200 injuries for every death. There is a great diversity of factors and areas where injuries occur. Many countries do not have a reliable surveillance systems, so this information is partially recorded.

One of the proposed classification for injury is based on cause of death, such as traffic accidents, falls, drowning, fires and burns, poisoning by solids and liquids, and firearms.

Although traffic accidents are the leading cause of accidental death in all age groups, morbidity from household accidents is very high in children under 5. In fact, the incidence of household injuries is higher than that of traffic accidents.

The most frequent household injuries are: falls, burns, ingestion of foreign bodies, choking, and electric accidents; 90% of household injuries could be avoided if due precautions were observed.

Caring for injury victims requires adequate organization of health services; it is therefore very important to know the scope of the problem, so health services and workers can incorporate the following activities: diagnosis, case management, and counseling for child caretakers on injury prevention and safe lifestyles.

Integrated Management of Childhood Illness (IMCI) strategy offers an adequate framework to study the magnitude of the problem since different health problems can be incorporated, based on their prevalence in the specific area.

OBJECTIVES

- To determine the prevalence of injuries in children under 5 in a specific area.

- To determine some characteristics of injuries in children under 5

METHODOLOGY

Since there is no exclusive registry of data sources for obtaining information, a survey will be utilized for children under 5. It can be used to question mothers who bring children for consultation at health services or during home visits.

The first selection methodology is the simpler of the two and requires fewer resources to execute. However, it will not make it possible to establish the prevalence of injuries in the population of the area, unless there are guarantees that the consultations of children under 5 to the selected health services provide a sample of the entire population. Employing this methodology will not make it possible to identify injuries for which the parents do not seek care at a facility.

The household survey, however, will make it possible to estimate prevalence, either by studying all the children in this age group or through a sampling technique. However, depending on the estimated incidence of the problem, a large number of visits may be required, which will be much more expensive.

In any circumstance, the methodology used should be defined based on the operational capacity of each place; and the interpretation of the findings must be adapted if the population studied is not considered representative of the total population in the area.

- If the study is based on the health services, the number of monthly consultations of children under 5 should be estimated and the length of the study determined in order to have a sufficient number of children.

- If the study is on a population basis, there should be an estimate of the prevalence of the problem in order to calculate the size of the study sample.

- In either case, the steps and methodology for calculating the size of the study sample are described in the section on estimate studies for the Statistical Methodology Support Module in Part II.

The study period should be at least 6 months, to estimate the annual prevalence of injuries. Since there are seasonal variations in accident type and frequency, it is recommended that the period include different times of the year or that the period of study be 12 months.

Information will be obtained by interviewing the parents or the child's caretaker. The survey should be conducted for each injury since a child could have more than one in the study period and it is the incidents themselves and not the injured children that are the object of the study.

The following information is to be obtained in the interview:

- Characteristics of the injured child (sex, age, etc.)
- Characteristics of the injury (cause, nature, location, etc.)
- Characteristic of the care (care site, care provider, etc.)
- Result of the injury (disability, death)

The Annex 50.A includes a model Parent Interview Chart that can be useful as a guide for formulating the corresponding questions and the classification recommended for data collection. The chart can be utilized for house calls or interviews outside of the home.

Any database program can be used to process the data. Thus the analysis can be carried out based on different combinations of the variables obtained. Using the information obtained the indicators mentioned on the prevalence of accidents in children can be calculated. Table 50.1 presents a list of some indicators, which can be complemented with others that are considered of interest and important or that arise from other variables incorporated into the study.

TABLE 50.1

INDICATOR	NUMERATOR	DENOMINATOR
Prevalence of injuries in children under 5	Number of injuries in children under 5	Total children under 5 surveyed
Prevalence of injuries in children under 5, by cause	Number of injuries in children under 5, by specific cause	Total children under 5 surveyed
Percentage of injuries requiring hospitalization	Number of injuries in children under 5 who were hospitalized	Total accidents in children under 5
Percentage of fatal injuries in children under 5	Number of children under 5 who suffered fatal injury	Total injuries in children under 5

.

ANNEX 50.A
PREVALENCE OF INJURIES IN CHILDREN UNDER 5

PARENT INTERVIEW CHART

Identification data:	
Child's surname and name:	
Age: [_____] Sex: [___] Date of birth: ____/____/____	
Mother's surname and name:	
Child's address:	
Interview date: _____/_____/_____ Date of initial consultation: ____/_____/_____	
Family composition (living in the same residence):	
Father Yes [__] No [__] Grandmother Yes [__] No [__]	Siblings Yes [__] No [__]
Mother Yes [__] No [__] Grandfather [__] No [__]	- Older No. [_____]
Who takes care of the child? [_____]	- Younger No. [_____]
Mother's level of education: Primary [__] Years [__] Secondary [__] Years [__] Postsecondary [__]	
Father's level of education: Primary [__] Years [__] Secondary [__] Years [__] Postsecondary [__]	
Level of education of the child's caretaker: Primary [__] Years [__] Secondary [__] Years [__] Postsecondary [__]	
Characteristics of the home: Urban [___] Rural [___] Number of rooms: [___]	
Indoor plumbing: Yes [__] No [__] Bathroom: Yes [__] No [__] Latrine: Yes [___] No [__]	
Eating area: Yes [__] No [__]	
No. of people sleeping in each room: [_____] No. of people who sleep with the child: [_____]	
Has the child had an accident in the last 6 months? Yes [__] No [__]	
Characteristics of the injury:	
Cause of the injury	
Nature of the injury	
Body part injured	
Place the injury occurred	
Activity that caused the injury	
Care of the child:	
Was the child treated for the accident? Yes [__] No [__] Where?	
At the site of the accident Yes [__] No [__] At home Yes [__] No [__]	
In a health center Yes [__] No [__] In the hospital Yes [__] No [__]	
Other:	
Who saw the child? Physician Yes [__] No [__] Nurse Yes [__] No [__]	
Other:	
Was the child hospitalized? Yes [__] No [__] In what department?	
For how long?	
Result of the accident:	
Did the child fully recover? Yes [__] No [__]	
Did/does the child have a temporary disability? Yes [__] No [__]	
What type?	For how long?
Does the child have a permanent disability? Yes [__] No [__]	
What type? Died? Yes [__] No [__]	

Recommended Classification for Collecting Injuries Data

Leading external cause of injury

1. Motor vehicle—driver (not applicable to children)
2. Motor vehicle—passenger *
3. Motorcycle–driver (not applicable to children)
4. Motorcycle-passenger *
5. Bicyclist (not applicable to children) or bicycle passenger *
6. Pedestrian
7. Other transportation-related circumstance
8. Horse-related (fall or bite)
9. Fall from a low level (< 1 m)
10. Fall from a high level (> 1 m)
11. Drowning—in swimming pool
12. Drowning—not in a swimming pool
13. Other threats to breathing
14. Fire, flames, smoke
15. Exposure to hot food or beverages, water, other liquids, steam or gas
16. Exposure to a hot solid object or substance (contact burn)
17. Poisoning—drug or medicine
18. Poisoning—other or unspecified substance
19. Firearm
20. Cut, perforation
21. Dog-related (includes bites)
22. Animal-related—other than horses (8) and dogs (21)
24. Machinery
25. Electricity
26. Heat (natural origin), sunlight
27. Cold (natural origin)
28. Other specific external cause (including final outcome)
29. Unspecified external cause
30. Collision with a person
31. Collision with an object

* Any vehicle occupant other than the driver.

Principal nature of the injury

*1. Superficial—excluding eyes, item (13)
* 2. Open wound—excluding eyes, item (13)
* 3. Fracture—excluding tooth, item (21)
* 4. Dislocation—including broken disks, cartilage, ligaments
* 5. Sprain or tension
* 6. Nerve damage—including spinal cord; excluding intracranial injury, item (20)
* 7. Blood vessel injury
* 8. Muscle or tendon injury
* 9. Injury due to crushing
*10. Traumatic amputation—including partial amputation
* 11. Injury to internal organ
* 12. Burn or corrosion—excluding eye, item (13)
13. Eye injury—including burns; excluding foreign objects, item (14.1)
    - 14.1 Foreign object in eye
    - 14.2 Foreign object in ear canal
    - 14.3 Foreign object in nose
    - 14.4 Foreign object in respiratory tract—excluding item (14.3)
    - 14.5 Foreign object in digestive system
    - 14.6 Foreign object in genitourinary area
    - 14.7 Foreign object in soft tissue
    - 14.9 Foreign object, other location/unspecified location

20. Intracranial injury - including brain concussion
21. Dental injury—including fractured tooth
22. Drowning or immersion
23. Asphyxiation or other threat to breathing—excluding drowning, item (22)
24. Electric injury
25. Poisoning or toxic effect—excluding poisonous bite, item (26)
26. Effect of poison; any insect bite
* 27. Other specific injury
* 28. Unspecified injury
* 29. Multiple injuries of different types
30. No injury detected

* The body part injured must be specified.

Principal body part injured

1. Head—excluding face
2. Face—excluding eyes
3. Neck
4. Chest
5. Abdomen
6. Lumbar area
7. Pelvis—including perineum, anogenital area, buttocks
8. Shoulders
9. Arms
10. Elbow
11. Forearm
12. Wrist
13. Hand—including fingers
14. Hip
15. Thigh
16. Knee
17. Leg
18. Ankle
19. Foot—including toes
20. Body part not specified
21. Multiple injuries to more than one body part
22. Body part **not required**

Where injury occurred

1. Home
2. Residential institution—including transitory lodging and orphanages; excluding hospitals, item (4)
3. School, other institution, or government building—including daycare; excluding hospitals, item (4)
4. Hospital or other health facility
5. Recreational area—mainly for informal recreational activity
6. Sports or athletic facility—mainly for formal sports
7. Street or highway—public road
8. Place of business or service provider
9. Industrial or construction area
10. Mine or quarry
11. Farm—excluding farmhouse, item (1)
12. Other specified location—including forest, beach, abandoned building
13. Location not specified

Type of activity the person was engaged in at the time of the accident

1. Sporting activity (not applicable to children under 5)
2. Recreational activity
5. Personal activity (sleeping, eating, etc.)
6. Being cared for
7. Formal educational activity as a student—including en route to the educational facility
8. Other specified activity
9. Activity not specified

PROTOCOL 51

PREVALENCE OF TUBERCULOSIS IN CHILDREN UNDER 5

INTRODUCTION

Tuberculosis is an infectious disease caused by *Mycobacterium tuberculosis*, an acid-fast bacillus(AFB).Transmission of tuberculosis is usually by inhalation droplet nuclei produced by an adult with infectious pulmonary tuberculosis. Human disease caused by (*M. avium, M. bovis*) has also been identified. At times, *Mycobacterium tuberculosis* passes through the meningoencephalic barrier, causing meningeal tuberculosis; ultimately, it can settle in other organs, such as the kidneys, lymph nodes, joints, etc., causing extrapulmonary disease.

Tuberculosis is generally found in adults, either because transmission occurs at that age or because an earlier primary infection is reactivated. Potential for transmission in the population increases with the number of cases of untreated pulmonary tuberculosis with positive sputum. Treated patients quickly cease to be a source of infection.

Tuberculosis does also affect children; early clinical manifestations occurring 1-6 months after initial infection can include severe forms of the disease such as miliary tuberculosis and tuberculous meningitis.

Although childhood tuberculosis is not very contagious, it is the result of tuberculosis in an adult and, therefore, is an indicator of tuberculosis prevalence in the community and the effectiveness of control measures for the disease in that community.

OBJECTIVE

To determine the prevalence of tuberculosis cases in children under 5 years of age among children receiving care in health service facilities.

METHODOLOGY

To achieve the protocol's objective, information must be obtained on tuberculosis cases in children diagnosed by personnel at health services facilities and compared to the total number of children attended the same health location in the same age group.

1. Select the health services to participate in the study, based on the following:

    1.1. If the selected health services receive tuberculosis cases and treat them, or at least coordinate care outside. If, for example, there are health services specialized in tuberculosis or respiratory problems and the population identifies them as such, children suspected of having the disease can be taken directly to those services. If these specialized services are not included in the study, the findings will underestimate the frequency of tuberculosis consultations in children under 5.

1.2. If the health services refer children suspected of having tuberculosis to specialized services, confirm that the first consultation is recorded in the primary care services and that the child was referred for suspicion of tuberculosis. Otherwise, information on possible cases of childhood tuberculosis that consulted health services will be lost.

2. Confirm the characteristics and quality of the consultation and hospitalization records, in order to obtain information on the diagnosis of tuberculosis in children. It should be noted that health services records often do not give information on the signs of illness the child presented, but rather the health worker's classification or diagnosis. Since each health worker records information differently, the criteria should be standardized if major differences are observed and the necessary data cannot be obtained.

3. The number of visits that must be studied to obtain data on tuberculosis prevalence should be estimated. This number should be set based on the estimated incidence of tuberculosis in children under 5 in the study area, or taking as a reference the number of cases of the disease in this age group reported the previous year by the health services participating in the study. If this information is not available, a specific number of visits of children under 5 can be reviewed, observing the number of tuberculosis cases among them. The steps and methodology for calculating the size of the study sample are described in the section on estimate studies for the Statistical Methodology Support Module in Part II.

4. Finally, once the sample size is determined, the period during which information will be compiled should be defined, either retrospectively or prospectively. This modality is preferable whenever adjustments must be made to obtain the information, for example, if the criterion for *suspected tuberculosis* is to be standardized.

Annex 51.A presents a model Consolidated Information Table that can be useful. Different indicators mentioned in the study objective can be calculated using data from the table. Table 51.1 presents some of those indicators, which can be used to prepare other indicators of interest.

TABLE 51.1

INDICATOR	NUMERATOR	DENOMINATOR
Percentage of children under 5 diagnosed with tuberculosis	Number of children under 5 classified as having tuberculosis by health workers (confirmed and unconfirmed)	Total number of children under 5 who consulted during the period
Percentage of children under 2 diagnosed with tuberculosis	Number of children under 2 classified as having tuberculosis by health workers (confirmed and unconfirmed)	Total number of children under 2 who were classified as having tuberculosis by health workers (laboratory confirmed and unconfirmed)
Percentage of children under 5 with laboratory-confirmed tuberculosis	Number of children under 5 with laboratory-confirmed tuberculosis diagnosis	Number of children under 5 diagnosed with tuberculosis (laboratory confirmed and unconfirmed)

ANNEX 51.A
PREVALENCE OF TUBERCULOSIS IN CHILDREN UNDER 5

CONSOLIDATED INFORMATION TABLE

Area: _____ Health Services: _____

AGE GROUP	TUBERCULOSIS			NO INFORMATION
	TOTAL	CONFIRMED	NOT CONFIRMED	
TOTAL				
< 1 YEAR				
1 YEAR				
2 YEARS				
3 YEARS				
4 YEARS				

Observations:

Instructions for filling out the Consolidated Information Table:

1. First fill in the identification data for the corresponding area and service at the top of the table.

2. Then take the records from the first day in the study period and look for the first consultation of a child under 5. Determine the child's age and, based on this, select the appropriate row in the Consolidated Information Table. Make a slash mark (|) in the second column (**Total**) of that row.

3. Then check whether or not the child was diagnosed with tuberculosis; if so, check for information on laboratory confirmation (either bacilloscopy or positive culture). Make a slash mark (|) in the corresponding box in the row for the child's age.

4. Continue with the next record of a child under 5 and repeat the procedure with this and all cases of children under 5 attended during the study period.

5. Select another Consolidated Information Table for each area or health services that participated in the study and repeat the previous steps.

6. Once all the records of all the health services or areas have been reviewed, add up the marks made in each box of every Consolidated Information Table and note the sum in each box.

7. To obtain the totals in the top row, add the numbers of each box in a given column, and mark the sum in the box in the first row (**Total**) of that column.

PROTOCOL 52

CHARACTERISTICS OF THE DIAGNOSIS AND TREATMENT OF TUBERCULOSIS IN CHILDREN UNDER 5 YEARS IN HEALTH SERVICES

INTRODUCTION

Although the incidence of tuberculosis in children is generally low, proper diagnosis and treatment are a priority, to reduce the severity and complications of the disease.

The diagnosis of tuberculosis in children is difficult. The majority of infected children do not present symptoms. TB cases are at times identified early as a result of contact with an adult patient identified as having the disease during the child's consultation to health services. Because of the asymptomatic progression of the disease or the appearance of nonspecific signs, health workers do not tend to investigate the possibility of tuberculosis in children who are brought in to health services by their parents. Due to limited possibilities for obtaining expectoration samples in children to identify bacilli, the disease must be diagnosed by analyzing a set of nonspecific factors that can lead to the suspicion and, sometimes, confirmation of the disease.

Other problems associated with the detection and diagnosis of tuberculosis are the application of various treatment criteria, regarding the drugs, dosage, duration of treatment, and form of administration (supervised or self-administered).

In this framework, standardizing criteria for suspicion of tuberculosis in children, as well as evaluation, diagnosis and treatment measures are very important in order to reduce the burden caused by the disease. Knowledge of current criteria being used in primary care health services, as well as in outpatient care in hospitals, can give a general overview of the situation and establish a baseline for evaluating changes that occur once standardized norms are implemented.

OBJECTIVES

- To describe the criteria for diagnosing and treating tuberculosis in children under 5 currently being applied by health services personnel.

- To evaluate the enforcement of existing recommendations or standards for diagnosing and treating tuberculosis in children under 5 in health services.

The first objective applies to health services that have not yet implemented targeted actions to standardize the criteria for diagnosing and treating tuberculosis. In this case, improving understanding of the criteria being used can help identify aspects to be emphasized during implementation of these standards. In situations in which proper standards of care have already been set, the application of this protocol can help to evaluate compliance in the health services.

El primero de estos objetivos se aplica a aquellos servicios de salud en los que no se han realizado aún acciones dirigidas a estandarizar los criterios de diagnóstico y tratamiento de la tuberculosis. En estas situaciones, el mejoramiento del conocimiento respecto de los criterios en uso puede ayudar a identificar aquellos aspectos a enfatizar durante la implementación de las normas que se adopten. En situaciones en que ya han sido dictadas normas correctas para la atención de los casos de tuberculosis, la aplicación de este protocolo puede ayudar a evaluar su cumplimiento en los servicios de salud.

METHODOLOGY

The target population of the study is health services personnel responsible for caring for children under 5 who come in as outpatients. The criteria the personnel is using to diagnose tuberculosis in children in this age group and the treatment type and modality they prescribe in these cases will be evaluated.

The steps and methodology for calculating the sample size are described in the section on estimate studies for the Statistical Methodology Support Module in Part II.

The study should include a review of clinical records or registries of tuberculosis cases in children under 5 diagnosed at the health service site. It can also include questions for the health workers concerning the criteria they use to diagnose and treat tuberculosis in children under 5.

The first activity consists in a retrospective evaluation of tuberculosis cases. Here, the following should be analyzed:

- The reason for consultation
- The signs and symptoms the child presented
- The studies conducted and their results
- History of contact with tuberculosis patients
- The diagnosis by the health workers
- The prescribed treatment and how it was administered or is being administered

Proper records containing this information are needed, otherwise it is impossible to determine if the absence of data is because it was not recorded or because it was not evaluated by the personnel.

If one wishes to supplement the study with a questionnaire for health workers responsible for caring for children under 5, the questions can be answered with or without the interviewer present.

The assessment of the questionnaire results should always take into account the review of the available information on tuberculosis diagnoses, since this will reflect the criteria that health workers apply in practice. However, the fact that certain criteria are recorded in the replies does not mean they are being effectively applied during care.

Annex 52.A presents a model chart that can be used to review cases in children under 5 diagnosed with tuberculosis. This chart can be adapted to prepare questions for health workers to answer.

Study procedures

1. Select the personnel or health services to be included in the study.

2. Define the study period, bearing in mind that if it is too long there may have been changes in health workers or in the criteria used to evaluate, diagnose, and treat tuberculosis in children. Since childhood tuberculosis is not a common disease, measures should be taken to ensure that a sufficient number of cases of the disease are found during the study period.

3. Define the variables that will be included in the study in order to determine the criteria for diagnosing and treating tuberculosis in children. To this end, review the chart in Annex 52.A and adapt and modify it as necessary. If there already is a standard for managing tuberculosis in children and the study is being used to determine the level of compliance reached in its application, all variables of the standard should always be included.

4. Select the records for children under 5 attended in the health services included in the study, to search for those diagnosed with diagnosis.

5. Once the tuberculosis cases have been identified, complete the information in the chart in Annex 52.A, filling out one chart for every tuberculosis case found.

6. The information not found in the case record must be noted. To this end, the chart has a category marked "*No Information"* for each variable.

7. Once the review and registry of all cases for all the health services in the study is complete, process the data recorded.

Data processing

Reviewing the records of tuberculosis cases in children under 5 will yield different information on the signs and symptoms present at the time of consultation, as a result of the examinations conducted and the prescribed treatment. Based on these data, the criteria used by health workers to diagnose and treat tuberculosis in children under 5 can be described.

If there are standards for tuberculosis diagnosis and treatment in children under 5, the criteria being used can be compared to those standards, to evaluate their fulfillment.

A computer database program such as Epi Info can be used to process the data, or some variables can be processed manually using a Consolidated Information Table like the one found in Annex 52.B.

Column one of the Consolidated Information Table shows some of the variables that can be studied, which can be modified in accordance with study needs.

Once the information from all the health services has been consolidated, various indicators on the criteria for diagnosing and treating tuberculosis in children under 5 can be calculated. Table 52.1 includes some indicators, which can be complemented with others, as deemed appropriate.

If the percentage of cases with no information is very high (40% or more), the calculation of the indicators will not be representative of the total, since information on the variable under study will not be available in a high percentage of the cases.

If we want to compare the change in health workers' evaluation, diagnosis, and treatment criteria, the same indicators should be used for two different periods. In this case, a drop in the percentage of cases for which there is no available information will have a positive impact, improving the records; this will make it possible to better analyze the criteria being used.

Finally, if one wishes to evaluate to what extent the criteria for diagnosis and treatment established in the standards of study site are being applied, those standards must be clearly defined and, in reviewing the registries, it should be determined whether or not they are being fulfilled.

TABLE 52.1

INDICATOR	NUMERATOR	DENOMINATOR
Percentage of cases of tuberculosis in children under 5 with compatible radiology, a tuberculin test over 10 mm, and identified contact with a tuberculosis patient	Number of children under 5 diagnosed with tuberculosis with compatible radiology, a tuberculin test over 10 mm, and identified contact with a tuberculosis patient	Total number of children under 5 diagnosed with tuberculosis minus the number of children for whom there is no radiology, tuberculin test, or contact information
Percentage of cases of tuberculosis in children under 5 who had a bacteriological study for tuberculosis	Number of children under 5 diagnosed with tuberculosis for whom information is provided on the bacteriological study for tuberculosis	Total number of children under 5 diagnosed with tuberculosis
Percentage of cases of tuberculosis in children under 5 confirmed bacteriologically	Number of children under 5 whose tuberculosis diagnosis was confirmed bacteriologically	Total number of children under 5 diagnosed with tuberculosis minus the number of children under 5 diagnosed with tuberculosis for whom there was no information on a bacteriological study for tuberculosis

ANNEX 52.A
DIAGNOSIS AND TREATMENT OF TUBERCULOSIS IN CHILDREN UNDER 5

INFORMATION CHART

Chart No.: _____ Place and Date: _____

Child's identification data:			
Surname and name of the child:			
Age: [____] Sex: [____]			
Date of the consultation/hospitalization: ____/____/____			
Main classification/diagnosis:			
Other classifications/diagnoses:			
Child's address:			
Clinical manifestations at the time of consultation:			
Cough		Yes [__] No [___]	No information [__]
Time: [_____]	Productive	Yes [__] No [___]	No information [__]
Dyspnea		Yes [__] No [___]	No information [__]
Change or drop in activity		Yes [__] No [___]	No information [__]
Does not gain weight/Difficulties eating		Yes [__] No [___]	No information [__]
Episodes of wheezing		Yes [__] No [___]	No information [__]
Fast breathing		Yes [__] No [___]	No information [__]
Difficult breathing		Yes [__] No [___]	No information [__]
Bronchial obstruction		Yes [__] No [___]	No information [__]
Lymphadenopathies		Yes [__] No [___]	No information [__]
Localization:			
BCG vaccination		Yes [__] No [___]	No information [__]
Diagnostic Studies			
Tuberculin Test		Yes [__] No [___]	No information [__]
Reading:			
Bacteriological confirmation		Yes [__] No [___]	No information [__]
Sample:		Technique:	
Chest x-ray		Yes [__] No [___]	No information [__]
Findings:			
Study of contacts		Yes [__] No [___]	No information [__]

Contact	*Study Conducted*	*Date*	*Result*

Other studies, examinations, etc.:

Treatment of the case

Drugs	*Daily dosage*	*Duration*

Type of treatment prescribed:

Supervised: Yes [__] No [___] No information [__]

Self-administered: Yes [__] No [___] No information [__]

Other treatments:

Observations:

ANNEX 52.B
DIAGNOSIS AND TREATMENT OF TUBERCULOSIS IN CHILDREN UNDER 5

CONSOLIDATED INFORMATION TABLE

Health Service/Area: _____ Period: _____

VARIABLE	TOTAL	YES	NO	NO INFORMATION
The child presented with: • Radiology compatible with tuberculosis; and • Tuberculin test over 10 mm; and • Contact with a case of bacteriologically- confirmed pulmonary tuberculosis				
The child was confirmed bacteriologically (bacilloscopy or culture)				
Chest x-ray not compatible with tuberculosis				
No contact with a tuberculosis patient				
With standard 6-month treatment: Two months of isoniazid, rifampicin, and pyrazinamide daily followed by - four months of isoniazid and rifampicin daily; - or four months of isoniazid and rifampicin two/three times per week				
With supervised treatment				

Observations:

Instructions for filling out the Consolidated Information Table:

1. Determine whether the charts will be processed together or separately according to some variable. For example, it might be interesting to know each health services' diagnosis and treatment criteria, in which case a Consolidated Information Table should be prepared for every health services. When selecting groupings, the number of charts in each group should be taken into account; if the number is very low analyzing the information separately will be of little interest. For example, if only three cases of tuberculosis for a health service were available for review, processing that information will not provide conclusions on tuberculosis management in children.

2. Next, determine the aspects of the study that will be included in order to analyze tuberculosis case management in children. The first column of the Consolidated Information Table has some elements of interest, which can be modified and supplemented with others. Modify the Consolidated Information Table and add all elements deemed important for inclusion in the study.

3. Prepare a Consolidated Information Table for each service included in the study if one wishes to obtain a description of the each service's criteria for tuberculosis management in children under 5. If using some other type of grouping, prepare a Consolidated Information Table with the variables to be studied.

4. Separate the charts by grouping to be studied.

5. Begin with the charts for the first group and note the health services data and period in the upper part of the Table.

6. Then begin reading each characteristic or variable in column one of the Consolidated Information Table and look for that information in the first chart in the group.

7. For each characteristic or variable, make a slash mark (|) in the corresponding column – for example, in the third column if the answer is YES, the fourth column if the response is NO, or the fifth column if no information was obtained on the item.

8. Once done with all the charts for the grouping for which this Table is being used, add up all the marks in each box and write the sum in that box.

9. Add the numbers in the boxes in each row and write the total in the corresponding box in the Total column (column two).

10. Continue by filling out another Consolidated Information Table for another grouping, following the same instructions.

PROTOCOL 53

PREVALENCE OF CHAGAS' DISEASE IN CHILDREN UNDER 5 YEARS OF AGE

INTRODUCTION

Chagas' disease, or American Trypanosomiasis, is caused by a parasite, *Trypanosoma cruzi,* that is transmitted to man primarily through vectors—Reduviid bugs or "kissing bugs," genus Triatoma, Rhodnius and Panstrongylus. It can also be transmitted through a blood transfusion, when the blood has not been properly screened to rule out the presence of the parasite (blood from an infected person), and can pass from mother to child during pregnancy.

The disease is limited to the region of the Americas, predominantly Mexico, Central and South America. There are three phases related to infection:
Acute phase, indeterminate and chronic phase. The acute form is most frequent in children, but can also be observed in adults. The early phase of the disease is frequently asymptomatic. However, Children are more likely to exhibit symptoms than adults.

At the present time, there is effective treatment to produce a negative serological reaction in children under 5. Since the disease is mostly chronic in adults and there is no treatment for the chronic phase, detecting infected children under 5 is very important to increase rates of treatment and cure through appropriate treatment.

Since diagnosis and treatment of Chagas' disease in children requires adequate organization of the health services, it is very important to know the prevalence of the disease in areas where it is endemic. Integrated Management of Childhood Illness strategy offers an adequate framework, since it can incorporate Chagas disease into the strategy based on the prevalence of the disease in the area.

OBJECTIVE

To determine the prevalence of Chagas' disease in children under 5 years in a specific area.

METHODOLOGY

To achieve the proposed objective, serological studies will be conducted in children under 5 to detect the presence of Chagas' disease. Two methods can be used to select children for the study:

- Children who utilize the health services in the area where the study will be conducted as a basis.

- Select children in the community.

The first selection methodology is easier to implement, since the study can be conducted during each consultation, and mobile teams do not have to be formed to collect blood samples. However, this methodology will not establish the prevalence of Chagas' disease in the population of the area, unless the consultations of children under 5 at the selected health services are proven to be a representative sample of the entire population.

The second methodology, however, will make it possible to estimate the prevalence of Chagas' disease, either by studying all the children in this age group or by using a sampling technique. In any event, the methodology should be chosen on the basis of the operational capacity of each location; the interpretation of the results must be adapted when the population studied is not considered representative of the total population in the area.

For reasons of simplicity and cost, finger-prick blood sampling is an appropriate method for the study, using filter paper to absorb the blood. The most highly recommended serological techniques are indirect hemoagglutination (IHA), indirect immunofluorescence (IFI), and the ELISA enzyme immunoassay technique. All the materials for these techniques are available on the market. They are simple to execute, responsive, and sufficiently specific. Either one or a combination of these techniques can be used for diagnosis, based on laboratory resources.

Procedures for executing the study

1. Select the area and determine whether the study will be conducted in health services or through house-to-house visits.

2. Determine the number of children who will be studied as follows:

    2.1. If the study is conducted in health services, estimate the number of monthly consultations of children under 5 and determine how long the study would have to be conducted to have a sufficient number of samples.

    2.2. If the study is conducted in the population, there should be an estimate of the prevalence of the disease in order to calculate the size of the study sample.

    2.3. The steps and methodology for calculating the size of the study sample are described in the section on estimate studies for the Statistical Methodology Support Module in Part II.

3. Organize how blood samples will be taken and laboratory tests conducted.

Annex 53.A presents a List of Information Collected on the test results of the children investigated.

Once test results are available for all the children studied, the information should be consolidated and processed. Annex 53.B presents a model Consolidated Information Table that can be useful.

Based on the information obtained, the indicators of Chagas' disease prevalence in children can be calculated. Table 53.1 presents a list of indicators that can be supplemented with others that are considered interesting and important or that stem from other variables incorporated into the study.

TABLE 53.1

INDICATOR	NUMERATOR	DENOMINATOR
Prevalence of children under 5 who test positive for Chagas' disease	Number of children under 5 who test positive for Chagas' disease	Total number of children under 5 with research findings on the presence of Chagas' disease
Prevalence of children under 2 who test positive for Chagas' disease	Number of children under 2 who test positive for Chagas' disease	Total number of children under 2 with research findings on the presence of Chagas' disease

Additional considerations:

The study of children under 5 will provide information on total Chagas' disease, but does not differentiate according to mode of transmission. Some children, for example, may have contracted the disease through vector transmission and others through prenatal transmission. Transfusions with infected blood are not typically a form of transmission in children under 5.

To obtain additional information on the relative frequency of vector and non-vector transmission, the following activities should be used to supplement the study:

- Testing the mothers of children under 5 to determine whether or not they are infected.
- Examining the children's dwellings and peridomiciliary area to determine whether or not insects (reduviid) are present.

If one wishes to evaluate the family's knowledge and attitude about the problem, parent interviews should be incorporated into the study.

ANNEX 53.A
PREVALENCE OF CHAGAS' DISEASE IN CHILDREN UNDER 5
LIST OF INFORMATION COLLECTED

Health Services: _____ Period/Year: _____

No	SURNAME AND FIRST NAME	SEX	AGE	RESULT

Observations:

ANNEX 53.B
PREVALENCE OF CHAGAS' DISEASE IN CHILDREN UNDER 5
CONSOLIDATED INFORMATION TABLE

Area: _____ Health Services: _____

AGE GROUP	TOTAL	POSITIVE FOR CHAGAS	NEGATIVE FOR CHAGAS	NO INFORMATION
TOTAL				
< 1 YEAR				
1 YEAR				
2 YEARS				
3 YEARS				
4 YEARS				

Observations:

Instructions for filling out the Consolidated Information Table:

1. First complete the data at the top of the Table, indicating the name of the corresponding area or health services where the study was conducted.

2. Then take the Chagas' disease test results reported by the laboratory.

3. Take the first test results and find the child's age; select the row corresponding to that age in the Consolidated Information Table.

4. Note the result of the test. If the child tested positive, make a slash mark (|) in the row for that child's age in the **Positive for Chagas** column. If the child tested negative, make a slash mark (|) in the row for that child's age in the **Negative for Chagas** column. If for some reason the results are not indicated, make a slash mark in the row for that child's age in the **No information** column.

5. Proceed in this way with the second child tested and continue with each successive child until all the tests conducted are reviewed.

6. Then add the number of slash marks (|) made in each individual box and write the sum in the box.

7. Add up all the numbers in each row and note the total in the **Total** column. Also add all the numbers in each column and note the resulting total for each column in the **Total** row.

PROTOCOL 54

PREVALENCE AND CHARACTERISTICS OF DENGUE CASES IN CHILDREN UNDER 5

INTRODUCTION

Dengue is a febrile, acute disease caused by one of the four virus serotypes (Den-1,2-3-4) of the genus Flavivirus. The disease occurs particularly in tropical countries in Asia, Africa, and the region of the Americas.

The dengue virus is perpetuated through a man-mosquito cycle, although the existence of a monkey-mosquito cycle as reservoir in southeast Asia and West Africa has not been ruled out. Aedes Aegypty a domestic day-bitting mosquito is the main vector involved on the transmission.

The disease is transmitted when an infective mosquito bites a person. Mosquitoes acquire the disease when they bite an infected person with dengue. The mosquito becomes infective 8 to 12 days after biting a sick individual and remains infective for the rest of its life.

Dengue affects humans at any age; it tends to be more benign in children than adults. It presents as an acute febrile disease that can cause a rash and nonspecific signs such as fatigue and joint pain, muscular, and retroorbital pain. Infection by a dengue virus causes lasting immunity. The case-fatality rate is generally low. However, when dengue hemorrhagic fever occurs, it has a higher case-fatality rate.

The disease is diagnosed through clinical signs and laboratory confirmation. The existence of previous cases of the disease is a major element of diagnostic suspicion. Other febrile diseases transmitted through arthropods, as well as measles and rubella, should be taken into account for the differential diagnosis.

Finally, the disease can be prevented by taking basic sanitary measures that reduce the presence of mosquitoes and protect the body from bites.

In endemic areas, dengue can fairly often be a cause of disease in children, particularly if basic measures to prevent mosquito bites are not taken. Therefore, knowledge of the existence of a problem, as well as the characteristics of the affected people, can be useful in order to target control measures at the local level. Subsequently, both the rate of occurrence of the problem, and the modification of certain practices that favor the transmission of the infection can be determined, to evaluate the impact of the control measures.

OBJECTIVE

To determine the prevalence of dengue in children under 5 in a specific area and identify some characteristics of the cases.

METHODOLOGY

The study should be conducted in areas where cases of dengue have already occurred, i.e. where tests indicate the infection has been transmitted.

Dengue cases can be identified based on persons who consult health services in the study area or through house calls. The first methodology is simpler and requires fewer resources to implement. Children could be studied during each consultation, precluding the need to form mobile teams for house calls. However, this will not establish the prevalence of dengue in the population of the area, unless there are guarantees that the consultations of children under 5 to the selected health services are a representative sample of the entire population.

The second methodology using house calls can estimate the prevalence of dengue, either by studying all children in this age group or using a sampling technique. However, depending on the estimated incidence of the disease, it may be necessary to conduct too many visits, which would be much more expensive. In addition, since diagnosis requires certain clinical skills, the personnel conducting the visits must be qualified to conduct a clinical examination of the children found in every house visited and to take blood samples for laboratory confirmation of the diagnosis.

In any circumstance, the methodology should be chosen based on the operational capacity of each location; the interpretation of the results must be adapted if the population studied is not considered representative of the entire population in the area.

Procedures for executing the study

1. Select the area where the study will be conducted and determine whether the study will be based in the health services or whether house-to-house visits will be conducted.

2. If the study is conducted on a population basis, there should be an approximate idea of the incidence of the problem in order to calculate the size of the study sample.

3. If the study is conducted in the health services, one must establish the number of children under 5 to study, taking into account the different subgroups into which the sample will be divided. For example, to differentiate cases by age, sex, or urban/rural area, one must make sure that the number of children studied in each of these subgroups is high enough (for example, no less than 50).

4. The steps and methodology for calculating the sample size are described in the section on estimate studies for the Statistical Methodology Support Module in Part II.

5. Once the sample size is determined, set the length of the study.

6. Define the diagnostic criteria that will be used and the laboratory tests that will be utilized to confirm the diagnosis. If the study is conducted retrospectively in the health services, it should be based on the service's records. The type of information that can be obtained from those records and the comparability of the information must be taken into account, i.e. is a *dengue* diagnosis noted in a record equivalent to the same diagnosis in another health service or noted by different health workers in the same service? The availability of the results of laboratory confirmation should also be taken into account; otherwise there is the risk of including in the group of children those diagnosed clinically without and without laboratory confirmation.

7. Specific characteristics to be studied must also be defined, such as sex, age, nutritional status, rural/urban housing, and certain conditions of the housing and surrounding area. The availability of information decides which characteristics to include, otherwise house calls will have to be conducted to determine, for example, certain specific characteristics of the child's housing and the surrounding area, such as the presence of standing water, which can serve as mosquito-breeding grounds.

Annex 54.A presents a model List of Information Collected that can be adapted in accordance with the variables incorporated into the study. It is also used to record the information found in health service records or obtained from a house call and interview with the parents. If the study is prospective, it can be used during consultations when a case of dengue is confirmed. It is to be filled out by interviewing the child's mother or relative.

Data processing

Annex 54.B presents a model Consolidated Information Table for a retrospective or prospective review of health service records.

Similar Consolidated Information Tables can be utilized to evaluate the rate of occurrence of dengue according to certain characteristics of children under 5 being studied separately. For example, to analyze the *gender* variable separately, one table should be prepared for girls and one for boys.

The child's record must include the study variable, otherwise differentiated information cannot be obtained from that source. Typically, gender and age are noted in consultation records. In some records, the address of the child's mother is indicated, which could be used to determine whether the child resides in an *urban or rural* area. However, other special characteristic variables related to *nutritional status* or housing cannot generally be obtained from consultation records (some clinical histories include this type of variable, but in this case the consultation record should be the first source of information, then the clinical history can be used for the remaining information).

Computer software can be used to process and consolidate this data (Epi Info or another similar program). Once the information from all the health services is consolidated, various indicators can be calculated on the percentage of dengue cases detected in children under 5 out of total cases that sought consultation in the study period, for a study like the one presented in Table 54.1.

TABLE 54.1

INDICATOR	NUMERATOR	DENOMINATOR
Prevalence of children under 5 diagnosed with dengue	Number of children under 5 diagnosed with dengue	Total number of children under 5 minus the total number of children under 5 for whom no diagnostic information is provided
Prevalence of children under 2 diagnosed with dengue	Number of children under 2 diagnosed with dengue	Number of children under 2, minus the number of children under 2 for whom no diagnostic information is provided
Prevalence of boys under 5 diagnosed with dengue	Number of boys under 5 diagnosed with dengue	Number of boys under 5, minus the number of boys under 5 for whom no diagnostic information is provided

ANNEX 54.A
PREVALENCE OF DENGUE IN CHILDREN UNDER 5

HOUSE CALL CHART

Chart Number: _____ Place and Date: _____

Child's identification data:				
Child's surname and name:				
Age: [____] Sex: [____] Date of consultation/hospitalization: ____/____/____				
Classification/diagnosis:				
Child's address:				
Characteristics of the family (living in the same residence):				
Mother's level of education:	Primary [_] Years [__]	Secondary [_] Years [__]	Postsecondary [__]	
Father's level of education:	Primary [_] Years [__]	Secondary [_] Years [__]	Postsecondary [__]	
Level of education of the				
child's caretaker:	Primary [_] Years [__]	Secondary [_] Years [__]	Postsecondary [__]	
Characteristics of the home:	Urban [___] Rural [___] Number of rooms: [___]			
Indoor plumbing:	Yes [__] No [__]	Bath: Yes [__] No [__]		
Latrine:	Yes [__] No [__]	Eating area: Yes [__] No [__]		
No. of people sleeping in each room:	[___]			
No. of people who sleep with the child:	[___]			
Is there standing water that can serve as mosquito-breeding grounds?		Yes [__] No [__]		
Sanitary conditions of the peridomiciliary area:		Good [___]	Fair [___]	Poor [____]
Characteristics of family health care:				
Checkups during last pregnancy	Yes [__] No [__]	Health center [__]	Hospital [___]	
Other:				
Has a Prenatal Card?	Yes [__] No [__]			
Early checkup:	Yes [__] No [__]	Periodic: Yes [_] No [_]		
Where was the child born?	Hospital [___]	Residence [___]		
Other:				
Has the child been with you since birth?		Yes [__] No [__]		
Did you breast-feed?		Yes [__] No [__]		
When did you first breast-feed?				
Was something given to the child before breast-feeding? Yes [__] No [__] What?				
Other than breast milk, did you give the child anything else when you left the hospital? Yes [__] No [__]				
When was the first time you took the child for a checkup?				
Where did you take him/her? Health services [_] Healer [__] Other:				

Do you have the child's vaccination card?	Yes [__] No [__]	
Are vaccinations current?	Yes [__] No [__]	
Do you have the child's growth chart?	Yes [__] No [__]	
Are checkups current?	Yes [__] No [__]	
Dynamic of the child's family and caretaker:		
Work Father	Yes [__] No [__]	
Outside the home?	Yes [__] No [__]	Hours
Mother	Yes [__] No [__]	
Outside the home?	Yes [__] No [__]	Hours

ANNEX 54.B
PREVALENCE OF DENGUE IN CHILDREN UNDER 5

CONSOLIDATED INFORMATION TABLE

Area: _____ Health Services: _____ Period: _____

AGE GROUP	TOTAL	DENGUE	NO DIAGNOSTIC INFORMATION
TOTAL			
< 1 YEAR			
1 YEAR			
2 YEARS			
3 YEARS			
4 YEARS			

Observations:

Instructions for filling out the Consolidated Information Table:

1. First fill in the identification data for the corresponding health service. If information is being obtained from different health services, prepare a table for each service and, ultimately, a Consolidated Information Table. Always note the period to which the information corresponds.

2. Begin reviewing the records, starting with those from the first day in the designated period and proceed as follows:

    2.1. Look at the record of the first child under 5 and based selected the row in the Table corresponding to the child's age.

    2.2. Make a slash mark in the second **Total** column in the Table.

    2.3. Then find the diagnosis that health workers noted for the child, utilizing all available information, including laboratory tests to confirm the suspicion of dengue, if conducted.

    2.4. If the child was diagnosed with dengue, make a slash mark in the third column of the row you selected.

    2.5. If the child has any other diagnosis, make no further marks, since the child has already been noted in the second **Total** column.

    2.6. If no information on the diagnosis is available, because none was recorded by health workers, make a mark in the last column "**No Diagnostic Information**" of the row selected for that child.

3. Continue looking at the records of cases treated until you find another child under 5 and follow the same steps.

4. Once all records from the period noted above the Table have been reviewed, add up all the slash marks (|) in each box and write the sum in each box.

5. Then add all the boxes in a single column and note the sum in the box in that column corresponding to the first **Total** row.

6. Follow the same procedure for the records of all the health services included in the study.

PROTOCOL 55

PREVALENCE OF DEVELOPMENTAL PROBLEMS IN CHILDREN UNDER 5 YEARS OF AGE

INTRODUCTION

Intellectual and behavioral development is an ongoing process that occurs in the same sequence in all children. The rate of development, however, varies from child to child. A given child may also experience temporary pauses in one or more areas (for example, speech). Development advances from top to bottom (development of the function of the head and hands precedes that of the legs and feet), and from universal or generalized responses to specific responses (gross motor functions develop before fine motor functions). The process depends mainly on the maturation of the central nervous system. It can slow to certain point for lack of sufficient practice (for example, when a child's activity is limited because of a prolonged disease); however increasing practice cannot significantly accelerate development.

Hereditary and factors related to the child's physical and social environment play a role in child development.

Identification of the child's achievements at each stage of development is the basis of evaluation, which permits early detection of changes, in order to correct them or to refer the case for study or special evaluation.

Growth and development programs are being introduced or effectively implemented in almost all countries in the Region of the Americas. However, the development component has made less progress than the growth component.

Since attending developmental difficulties in children requires adequate organization of the health services, it is very important to know the scope of the problem, in order to incorporate diagnosis and treatment into the activities of health services and workers.

The Integrated Management of Childhood Illness strategy offers an adequate framework to that end, since different health problems can be incorporated into it, based on their prevalence in the area where the strategy is being applied.

OBJECTIVES

- To determine the prevalence of developmental problems in children under 5 who consult health services.

- To determine some characteristics of developmental problems in children under 5.

METHODOLOGY

First, select one or more areas where the study's target population resides. Keep in mind that this population can go to one or more health services when a child is sick or for a checkup; this is important because the basis for the study is children under 5 who consult health services.

PAHO/WHO criteria will be utilized for this study in order to evaluate development in children under 5 in the psychomotor, intellectual, and psychosocial phases.

It should be emphasized that the ages indicated correspond to 90% of children. The behaviors described can be achieved before the age mentioned, but it is a warning sign if they still have not been achieved at the age indicated.

Children under 5 who go to health services for any reason will be selected for this evaluation. Depending on the number of consultations, one can evaluate all children who consult health services or take a sample of those children. To determine the study sample size, there should be an estimation of the problem. The steps and methodology for calculating the size of the study sample are described in the section on estimate studies for the Statistical Methodology Support Module in Part II.

Children who require care in health services may be more susceptible to a developmental problem; it is therefore important to include children brought in for well-child checkups.

A survey will be also conducted with the mother or caretaker on the history of the child, the family, and the environment in order to describe some characteristics found in children with developmental deficiencies.

Procedures for executing the study

1. Select the area where the study will be conducted.

2. Calculate the sample size sample. In this health services study, when establishing the number of children under 5 to be studied, the different subgroups into which the sample will be divided should be taken into account. For example, to differentiate cases by age, sex, or urban/rural area, make sure that the number of children studied in each of these subgroups is high enough (for example, no less than 50).

3. Determine the length of the study.

4. Collect data on the child's development on a form like the model in Annex 55.A (Information Collection Chart on Child Development).

5. Annex 55.B presents a model Chart for the Mother or Caretaker Survey, which can be adapted, based on the variables incorporated into the study. This survey can be conducted during the consultation or in a subsequent home visit.

Data Processing

Any database program can be utilized to process the data. Thus different combinations of the variables obtained can be analyzed.

The indicators to be prepared refer to the presence or absence of developmental signs in children according to their age group.

If one wishes to analyze factors related to normal child development, the development evaluation can be broken down into groups, in order to compare children who presented normal development and those with some type of delay.

Table 55.1 presents, by way of example, some indicators that can be calculated based on the information from the study. Others indicators can be prepared based on those in Table 55.1, taking into account the questions that are included in the interview or survey form.

TABLE 55.1

INDICATOR	NUMERATOR	DENOMINATOR
Percentage of children under 5 who presented a developmental delay for their age	Number of children under 5 who presented a developmental delay	Total number of children under 5 evaluated
Percentage of children with a developmental delay, by age group	Number of children with a developmental delay, by age group	Total number of children evaluated, by age group
Percentage of children under 5 with a developmental delay who was seen during a sick visit.	Number of children under 5 with a developmental delay who was seen during a sick visit	Total number of children under 5 evaluated
Percentage of children under 5 with a developmental delay who was seen during a checkup visit control	Number of children under 5 with a developmental delay who was seen during a checkup visit	Total number of children under 5 evaluated

ANNEX 55.A
PREVALENCE OF DEVELOPMENTAL PROBLEMS IN CHILDREN UNDER 5

INFORMATION COLLECTION CHART ON CHILD DEVELOPMENT

Health Services: _____ Period: _____

Child's identification data:			
Child's surname and name:			
Age: [____] Sex: [____]			
Reason for the consultation: Illness [ ] Checkup [ ]			
Main classification/diagnosis:			
Age	**Developmental aspects to assess**	**YES**	**NO**
2 months	• Looks attentively at the face		
	• Begins to smile when prompted		
3 months	• Holds head up		
	• Looks with eyes for the source of a sound		
	• Smiles when prompted		
4 months	• Holds head up		
	• Looks with eyes for the source of a sound		
	• Smiles when prompted		
	• Rolls onto back or stomach		
6 months	• Can sit		
	• Is interested in his/her reflection in the mirror		
9 months	• Is initially timid with strangers		
	• Begins to respond to "NO"		
	• Babbles "mama" and "dada"		
	• Finds objects that are hidden with a cloth		
	• Sits unsupported		
	• Begins pincer grasp. Opposes index finger and thumb		
	• Can pull self up holding on to furniture		
	• Begins to crawl and cruise holding on to furniture		
12 months	• Crawls and cruises by holding furniture or someone's hand		
	• Pincer grasp. Opposes index and thumb		
	• Stops when told "NO"		
	• Can drink from a cup		
18 months	• Walks unassisted. Crawls up stairs		
	• Puts small objects into bottles		
	• Plays by him/herself		
	• Helps with simple chores		
	• Eats with a spoon, spilling little		

Age	Developmental aspects to assess	YES	NO
24 months	• Climbs stairs holding on to the banister		
	• Puts small objects into bottles		
	• Builds towers of three blocks		
	• Helps with simple chores		
	• Puts on some clothes		
	• Washes and dries hands		
	• Eats with a spoon, spilling little		
36 months	• Climbs stairs unsupported		
	• Jumps in place and kicks a ball		
	• Copies a drawing of a circle		
	• Puts on some clothes and also takes them off		
	• Follows complex orders		
	• Builds sentences with verbs		
4 years	• Jumps on one foot		
	• Pedals a tricycle		
	• Copies a drawing of a cross		
	• Shares toys with other children		
	• Takes off some clothes		
	• Follows complex orders		

ANNEX 55.B
PREVALENCE OF DEVELOPMENTAL PROBLEMS IN CHILDREN UNDER 5

PARENT INTERVIEW CHART

Chart Number: _____ Place and Date: _____

Child's identification data:
Child's surname and name: Age: [____] Sex: [____]
Classification/diagnosis:
Child's address:
Characteristics of the family (living in the same residence):
Mother's level of education: Primary [_] Years [__] Secondary [_] Years [__] Postsecondary [__]
Father's level of education: Primary [ ] Years [__] Secondary [_] Years [__] Postsecondary [__]
Level of education of the
child's caretaker: Primary [_] Years [__] Secondary [_] Years [__] Postsecondary [__]
Characteristics of housing: Urban [___] Rural [___] Number of rooms: [_____]
Indoor plumbing: Yes [__] No [__] Bath: Yes [__] No [__] Latrine: Yes [___] No [__]
Eating area: Yes [__] No [__] No. of people sleeping in each room: [__]
No. of people who sleep with the child: [__]
Sanitary conditions of the peridomiciliary area: Good [___] Fair [___] Poor [____]
Characteristics of family health care:
Checkups during last pregnancy Yes [__] No [__]
Health center [__] Hospital [___] Other:
Has a Prenatal Card? Yes [__] No [__]
Early checkup: Yes [__] No [__] Periodic: Yes [__] No [__]
Where was the child born? Hospital [___] Residence [___] Other:
Has the child been with you since birth? Yes [__] No [__]
Did you breast-feed? Yes [__] No [__]
When was the first time you breast-fed?
Was the child given anything before breast-feeding? Yes [__] No [__]
What?
Other than breast milk, did you give the child anything else when you left the hospital? Yes [__] No [__]
When was the first time you took the child for a checkup?
Where did you take him/her? Health services [__] Healer [__]
Other:
Do you have the child's vaccination card? Yes [__] No [__]
Are vaccinations current? Yes [__] No [__]
Do you have the child's growth chart? Yes [__] No [__]
Are checkups current? Yes [__] No [__]
Dynamic of the child's family and caretaker:
Work Father Yes [__] No [__] Outside the home? Yes [__] No [__] Hours
Mother Yes [__] No [__] Outside the home? Yes [__] No [__] Hours

PROTOCOL 56

CHARACTERISTICS OF CHILD ABUSE IN CHILDREN UNDER 5 YEARS OF AGE

INTRODUCTION

According to WHO, battered child syndrome is *all forms of physical or mental abuse or harm, neglect or negligent treatment, mistreatment or exploitation, including sexual abuse of the child by a parent, legal representative, or any other caretaker.* This definition contains biological, physical, and psychosocial elements; however, in practice, proper diagnosis of abuse is difficult, especially in cases with no physical injuries. The parameters of what is considered abuse are not well established and the difficulty of defining them lies in the degree of social permissibility set by cultural and ideological patterns.

One of the main problems when addressing abuse is that the true scope of the problem is not known, since many factors hinder investigation (deep cultural and historical roots; diverse opinions on its definition and classification).

While real data is not available, child health promotion and care and child abuse prevention policies may be inadequate, since the number of cases and their importance is not known; also we do not know if the cases detected from the different areas correspond to the reality or are only a small portion of cases.

Health professionals have a privileged position in prevention, detection, and intervention in cases of child abuse; however not all professionals or the health system itself are currently, in a position to adequately address all aspects of abuse. However, primary health care services should stand out in child abuse prevention, since they are the only services to which children under 5 have broad access. Starting at that age, other mechanisms, basically the school system, begin to play a fundamental role in controlling child abuse.

This study will be limited to researching physical abuse, since it is the form of child abuse that health workers most often encounter. In addition, more diagnostic, treatment, and monitoring resources tend to be available for physical abuse than for other forms of abuse. If one wishes to broaden the study to identify other forms of child abuse, identification of cases of emotional abuse, negligence, sexual abuse, and exploitation should be included.

OBJECTIVES

To determine the percentage of consultations related to physical abuse in children under 5.

To describe the characteristics of physical abuse in children that can be detected in the health services.

METHODOLOGY

A descriptive study will be conducted, based in health services that serve children under 5. Hospitals and outpatient health care services should be included, in order to identify the different degrees and severity of physical abuse in children.

All children under 5 who consult for injuries or poisoning will be included, classified as intentional or non-intentional (often intentional injuries are misclassified) according to International Classification of Diseases (ICD) codes in its Ninth and Tenth Revisions (see Annex 56.A), for a 6-month period.

Physical abuse is defined as the intentional use of physical strength (by a family member or other responsible person who has contact with a child or a child in his/her care, aimed at hurting, injuring, or destroying the child. This includes:

- use of a weapon, object, or foreign substance;
- intentional blows, punctures, or bites; and
- any other physical assault (immersion, burns, pushing, etc.).

Child abuse will be suspected in all children under 5 diagnosed with physical injuries of any type that were noted in the clinical history as intentional or who presented with injuries typical of abuse (Annex 56.B), even if family members give a different version of the cause.

One of the greatest problems is distinguishing intentional injuries from non-intentional ones. However there are factors that confirm or create strong suspicion of abuse, including:

1. Injuries or patterns of injuries not consistent with the explanation offered:
   - Frequent fractures
   - Subdural hematoma and retina hemorrhage (with or without skull fracture)
   - Circular damage on wrists and ankles
   - Strangulation marks.

2. Past history of abuse documented in medical reports.

3. Injuries that point to abuse: bite marks, lacerations on the wrists or ankles from being tied up, erythema from an open hand, burns from immersion in hot water, etc.

4. Admitted abuse by the perpetrator.

5. Reports from witnesses to the abuse.

In some cases, patterns leading to a diagnosis of abuse may be the result of other disorders or diseases, for example, imperfect osteogenesis for frequent fractures; however these conditions are very infrequent.

Once a suspected case of physical abuse is determined, the chart or questionnaire should be filled out with the information contained in the clinical history in order to characterize the case. The Information Collection Chart is presented in Annex 56.C. This chart can be modified based on the study's proposed objectives, adding variables to investigate or enhancing the degree of detail of existing variables.

Table 56.1 presents some indicators that can be obtained with the data collected.

TABLE 56.1

INDICATOR	NUMERATOR	DENOMINATOR
Percentage of children with strong suspicion of abuse out of the total consultations of children under 5	Number of children under 5 with suspicion of abuse who went for consultation	Total consultations of children under 5
Percentage of children abused out of total hospitalizations in children under 5	Number of children under 5 with suspicion of abuse who were hospitalized	Total children under 5 hospitalized
Percentage of children under 5, by abuser	Number of children under 5 abused by father, mother, etc.	Total children under 5 with suspicion of abuse
Percentage of children under 5 with serious injuries relative to the total number of abused children	Number of children under 5 with serious injuries	Total children under 5 with suspicion of abuse

ANNEX 56.A

INTERNATIONAL CLASSIFICATION OF INJURIES

- **Unintentional injuries**
  ICD-9 E800-E869 E880-E929
  ICD-10 V01-X59 Y85 Y86

- **Intentional injuries**
  ICD-9 E950-E959
  ICD-10 X60-X84 Y87

- **Assault, abuse, and neglect**

  Sexual assault
  ICD-9 E960.1
  ICD-10 Y05

  Abuse by relatives
  ICD-9 E967.0
  ICD-10 Y07.1

- **Other unspecified assault**

Including neglect or abandonment by relatives, spouse, or partner
ICD-9 E960.0 E961-E966, E967.1-E969
ICD-10 X85-Y04 Y06 Y07.2-Y09.9 Y87.1

Event with undetermined intent
ICD-9 E980-E989
ICD-10 Y10-Y34 Y87.2

ANNEX 56.B

CHART TO IDENTIFY CHILDREN AT RISK OF CHILD ABUSE

Identification Data:		
Initials of child's surname and name:		
Physical signs of abuse in children:	**YES**	**NO**
Bruises or blows in different states of scarring; marks; and signs of beatings on the face, lips, nose, arms, legs, trunk, or buttocks. Blows to both eyes or cheeks (usually blows are to one side of the face)		
Subdural hematomas		
Finger marks on the arms, legs, or cheeks		
Scars that show the objects used for the beating, such as signs of whips, belts, ties, buckles, cables, etc.		
Permanent marks		
Lacerations or abrasions on the nose, lips, gums, eyes, external genitals, arms, legs, buttocks, or trunk		
Cigarette scars or burns, especially on the soles of the feet and palms of the hands, back, or buttocks		
Burns or scars with objects, such as an iron, on arms, legs, chest, or back		
Scars or tie marks on wrists, ankles, or neck		
Burns from immersion in boiling liquids — water or otherwise – on the feet and the hands (like a stocking or glove), buttocks, or genitals		
Frequent and untreated fractures that heal poorly		
Absence of hair on some part of the head, hemorrhage of the scalp		
Hemorrhage of the retina		
Bruised eyes		
Nasal fractures or deviation of the partition		
Broken teeth, swelling or bruises in the buccal cavity		
Dislocation of the elbow or shoulder		
Existence of skull fractures		
Broken ribs		
Compressions and deformations in cuneiform of the vertebrae		
Internal chest injuries, with lung contusion		
Intracranial injuries		
Various eye injuries		
Abdominal traumas		

ANNEX 56.C

CHILD ABUSE INFORMATION COLLECTION CHART

Identification data:		
Initials of the child's surname and name:		
Date of birth: ____/____/____ Sex: [____]		
Date of the interview: _____/_____/_____		
Does the child attend school or day care?		
Full day [ ] Half a day [ ] Does not attend [ ]		
Socioeconomic level:	Low [__]	less than 75% of average family income in the area
	Medium [__]	between 75% and twice the average income
	High [__]	over twice the average income
Poor [__] Middle [__] Upper [__] No information [__]		
Where does the child live?	At home with both parents [__]	At home with the mother only [__]
	At home with the father only [__]	At home with employers [__]
	On the street [__]	
	In residences [__]	Specify:
	Other [__]	Specify:
Severity of injury:	Fatal [__]	resulted in death
	Serious [__]	considerable damage or permanent physical injury;
		usually requires hospitalization
	Moderate [__]	hospitalization is not needed to treat the child's injuries;
		the signs and symptoms persist for less than 48 hours.
Reason for suspicion of abuse:		
	The child reported the abuse [__]	
	The perpetrator admitted the abuse [__]	
	A relative or caretaker reported the abuse [__]	
	The family member cannot explain how the injuries occurred [__]	
	The explanations of how the injuries occurred are not consistent with	
	the clinical findings [__]	
	History of past abuse of the child or a sibling [__]	
	Other [__]	
Level of certainty that the injury was intentional (non-accidental):		
	Without a doubt [__]	
	Very suspicious [__]	
	With some suspicion [__]	
Known or suspected perpetrator:		
	[___] Mother	[___] Father
	[___] Other member of the immediate family	
	Specify:	
	[___] Relatives of the partner or friends	
	[___] Other	[___] Age: [___] Sex:
	Relation to the victim:	

PROTOCOL 57

PREVALENCE OF BIRTH DEFECTS IN NEWBORNS

INTRODUCTION

Birth defects affect 3% to 5% of all births, and half of those cases could be prevented. These congenital abnormalities, or defects, are the leading cause of infant mortality in the developed world and rank second in many developing countries. Congenital malformations are anatomical abnormalities presented at birth.

Although the term "congenital" means present at birth, some defects are only diagnosed days, months, or even years later. Functional defects are as common as anatomical (or morphological) ones. Many malformed infants have chromosomal abnormalities and the embryo itself is extremely vulnerable during the first eight weeks, to radiation exposure, viruses and certain drugs.

No child should be born with a preventable defect. Preventive methods are available for 70% of the anomalies that affect 50% of newborns with defects. For the other half, research must be conducted to uncover the causes and mechanisms of defective prenatal development.

Some preventable risk factors can occur after conception (rubella, alcohol, teratogenic chemicals). Their harmful effects occur so early in embryogenesis that preventive measures should begin before conception. For that reason, planned pregnancies are at lower risk for birth defects. Women at both ends of the range of child-bearing years are at risk for birth defects. For mothers under 20, the main risks are low birthweight, gastroschisis, and defects from vascular disruption. For mothers over 35, the risks are Down syndrome and other chromosome anomalies.

Routine basic prenatal care can prevent the causes of birth defects through adequate control and treatment of illnesses that affect 1 in 10 pregnant women. Prenatal care that monitors weight, blood pressure, fundal height, and occasionally sugar and protein in the urine is sufficient to satisfactorily prevent, diagnose, and treat most illnesses in pregnant women.

Illnesses and medications can cause birth defects, and interactions tend to be difficult to uncover. Maintaining low blood glucose levels in diabetic pregnant women and use of monotherapy to treat pregnant women with epilepsy can prevent the occurrence of birth defects.

Congenital infections caused by Cytomegalovirus, Toxoplasmosis, Syphilis, and Rubella have a high rate of fetal abnormalities than other infections. Approximately 1% of all infants are infected in utero with CMV and excrete CMV at birth. In utero fetal infection can occur regardless of being a primary infection or reactivation. 10%-20% of infants whose infection resulted from a primary maternal infection will have some form of mental retardation or deafness. Primary maternal infection with syphilis nearly always cause serious fetal infection, secondary infections can also affect the fetus, although less frequently. Rubella virus is the most teratogenic virus. About 15-20% of infants born to women who had Rubella during the first trimester are congenital malformed.

Neural tube defects are very common birth defects and can be prevented if women uses routine folic acid before conception and during the first four weeks of pregnancy.

Occupational exposure can also impact the appearance of birth defects. Working women are at greater risk of subfertility, miscarriage, and birth defects than housewives. Lead (battery and printing industries) and polychlorinated biphenyl (PCB—plastics industry) are risk factors for mental retardation, while short waves (physical therapists) increase the risk of miscarriage.

Since caring for children with birth defects requires adequate organization of health services, it is very important to know the scope of the problem, in order to evaluate the most effective prevention activities, according to the situation in each region.

OBJECTIVE

To determine the prevalence of congenital abnormalities in deliveries attended in health services.

METHODOLOGY

To achieve this objective, information on congenital abnormalities should be obtained in live births and stillbirths weighing 500g or more.

The following steps should be followed to conduct the study:

1. Select the health services that will participate in the study. Consider health services for the study that have a large number of deliveries, in order to collect the data in a period of no more than one year, bearing in mind that birth defects occur in only 3% of births.

2. Check the characteristics and quality of delivery, live birth, mortality, hospitalization, and autopsy records, in order to be able to obtain information on births with abnormalities. Often health service records do not provide all the information necessary for the study; therefore one should consider using special registries for the study.

3. An abnormality is considered to be any morphological alteration that can be clinically diagnosed with an acceptable degree of certainty. The classification of birth defects will be taken from the description of abnormalities in the Latin American Collaborative Study of Congenital Malformations (ECLAMC), which is presented in Annex 57.A. One should consider and record all abnormalities observed in newborns, describing each one.

In some cases, training health workers to clinically detect malformations before beginning the study can be proposed.

To understand the situation and trends, it would be interesting to collect data from the past three years.

Annex 57.B presents a model Consolidated Information Table. Using information from the Table, the percentage of children born with congenital malformations in health services during the study period can be calculated.

Table 57.1 includes some examples of indicators to calculate, as well as the mathematical formula. The indicators are included only by way of example, since other ratios can be calculated using data from the Consolidated Information Table.

TABLE 57.1

INDICATOR	NUMERATOR	DENOMINATOR
Prevalence of births with congenital abnormalities	Number of births with congenital abnormalities	Total number of live births and stillborns weighing 500 grams or more
Prevalence of births with congenital abnormalities, by gender	Number of births with congenital abnormalities, by gender	Total number of live births and stillborns weighing 500 grams or more, by gender
Prevalence of births with congenital abnormalities, by cause	Number of births with congenital abnormalities, by cause	Total number of live births and stillborns weighing 500 grams or more

ANNEX 57.A

CLASSIFICATION OF CONGENITAL ABNORMALITIES

- Anencephaly
- Cephalocele
- Microcephaly
- Hydrocephalus
- Spina bifida
- Ear defects
- Ear implantation anomalies
- Preauricular appendages
- Preauricular fistula (or foseta)
- Macrostomia
- Cleft lip and/or palate
- Imperforate anus
- Ambiguous genitals
- Hypospadias
- Cryptorchidism
- Club-foot or deformed foot
- Polydactyly
- Syndactyly
- Reduced limb size anomalies
- Hip luxation
- Omphalocele and gastroschisis
- Nevus
- Hemangioma
- Micrognatia and retrognatia
- Abnormal facies
- Conjoined twins
- Skeletal displacia
- Chromosome anomalies
- Heart diseases

ANNEX 57.B
PREVALENCE OF BIRTH DEFECTS IN NEWBORNS

CONSOLIDATED INFORMATION TABLE

Hospital: _____ Period: _____

BIRTH CODE	SEX	MALFORMATION 1	MALFORMATION 2	MALFORMATION 3	MALFORMATION 4

Observations:

Instructions for filling out the Consolidated Information Table:

The Consolidated Information Table can used to systematize information collected from deliveries attended in health services.

Fill out the table as follows:

1. Complete the upper part of the table indicating the health service and the study period.

2. Indicate the birth identification number, according to hospital standards (registration number or other identification code).

3. Indicate the gender.

4. Indicate the type of malformation found. All abnormalities the child presents should be indicated, according to the classification in Annex 57.A.

PROTOCOL 58

MULTIDRUG –RESISTANTS ORGANISMS CAUSING PNEUMONIA AND DIARRHEA IN CHILDREN

INTRODUCTION

In many countries, an increase in bacterial resistance to antibiotics has been observed in recent years; For the most part, the resistance is to first-line antibiotics, which are inexpensive and widely used. However, in some cases, the introduction of new drugs was followed by quick selection and spread of drug-resistant strains.

Inappropriate use of antibiotics increases the risk of the selection and spread of resistant bacteria. However, the relationship between the use of antibiotics and the appearance and spread of resistance is complex. Mere use of antibiotics in clinical practice cannot explain the high prevalence of resistant bacteria in developing countries. Nevertheless, excessive use is at least partially responsible for the increased rates of resistance, especially in the hospital setting. The unnecessary prescription of antibiotics is high in cases of acute infantile diarrhea and viral respiratory infections.

Other causes that foster improper treatment and the selection of resistant bacteria are related to patients not properly fulfilling the prescribed treatment, incomplete regimens because of the cost of the drugs, lack of trained health workers, sale of antibiotics without a medical prescription, and poor quality of antibiotics.

Information on drug resistance to the most frequent causative agents of disease in children is extremely important for clinical practice and for updating standards on the rational, effective use of antibiotics.

OBJECTIVES

- To determine the prevalence of antibiotic resistance among bacterial agents that most often cause pneumonia and diarrheal diseases.

- To describe some characteristics of factors associated with the appearance of resistance.

METHODOLOGY

Microbial isolations will be obtained from samples taken in children under 5 diagnosed with an acute respiratory infection (ARI) and diarrheal diseases (DD) who consult a health center.

The following agents will be investigated: for pneumonias, *Streptococcus pneumoniae* and *Haemophilus influenzae;* for diarrheal disease: *Shigella*, *Salmonella*, *Vibrio cholerae, and* enteropathogenic and enterotoxigenic *Escherichia coli*.

Selecting the services

Health services should be selected, based on the size and characteristics of the population attended, as well as their bacteriological laboratory resources.

It is advisable to select hospitals in terms of collection and transportation of samples for bacteriological studies. However, one should bear in mind the difference between infections acquired in the community and nosocomial infections. The latter are more often caused by antibiotic-resistant bacteria.

Criteria for inclusion

Pneumonia

For bacteriological diagnosis of the etiology of pneumonia in children, sterile samples should be examined — typically blood samples. In Latin American countries, the sensitivity of the bacteriological culture of blood samples (hemocultures) in children hospitalized for pneumonia, without previous antibiotic treatment, is usually low — 3% to 6% of cases have positive hemoculture for bacteria. Since the prevalence of positive results is low, a sample of over 4,000 cases of pneumonia would have to be examined to obtain a sufficient number of bacterial strains and measure their susceptibility to antibiotics. Such research would not be feasible except in large cities, due to the high cost and length of time involved.

One practical alternative is to use nasopharyngeal secretions as clinical samples for bacteriological examinations. It is well established that strains isolated from nasopharyngeal secretions cannot be used to determine the etiology of an individual case of pneumonia. However, it has been shown that bacterial resistance of strains isolated from nasopharyngeal secretions in a sample of children with pneumonia very closely reflect the resistance of bacteria that cause pneumonia in children in that area. It was also shown that nasopharyngeal strains in children with signs of acute respiratory infection in general share the same characteristics in terms of serotype and bacterial sensitivity to antibiotics as the strains isolated from children with pneumonia. A strong correlation was found in bacterial resistance between strains of Streptococcus pneumoniae and Haemophilus influenzae isolated from the blood and those isolated from nasopharyngeal secretions.

Therefore, the study can be conducted by choosing a sample of children with signs of acute respiratory infection who consult primary health care services. The sampling of these children has the following advantages: there can be a high number of children in a period of two or three months; the size of the sample is relatively low because the two bacteria mentioned can be found in the nasopharyngeal secretions of a very high percentage of children; mobile teams can be set up for a short period in a health center to obtain the samples and forward them to a central laboratory for processing; nasopharyngeal samples are easier to obtain than blood samples; the study is much less expensive.

The children will be classified according to the IMCI Strategy Procedural Tables for children with cough or difficult breathing (Table 58.1).

TABLE 58.1

Children under 5 diagnosed with pneumonia according to the following criteria		
Age	Classification	Signs
2 months to 4 years	Very serious pneumonia	Cough or difficult breathing with central cyanosis or inability to drink
	Serious pneumonia	Cough or difficult breathing and subcostal indrawing without central cyanosis or inability to drink
	Pneumonia	Cough or difficult breathing with fast breathing but without subcostal indrawing: ages 2 to 11 months, 50 or more per minute; ages 12 months to 4 years, 40 or more per minute.
	Cough or Cold	No sign of pneumonia or very serious disease
Under 2 months	Serious pneumonia or very serious disease	Stopped feeding well
		Abnormally sleepy or difficult to awaken
		Convulsions
		Wheezing
		Fever (38°C or more) or low body temperature (less than 35.5°C)
		Stridor in a child at rest
	Cough or Cold	No sign of pneumonia or very serious disease

Diarrheal diseases

The children will be classified according to the IMCI Strategy Procedural Tables for children with diarrhea (Table 58.2).

Children under 5 diagnosed with diarrhea according to the following criteria:		
Age	Classification	Signs
2 months to 4 years	Diarrhea with serious dehydration	At least two of the following signs: - Lethargic or unconscious - Sunken eyes - Drinks poorly or inability to drink - Pinch test: skin returns very slowly to previous state
	Diarrhea with some degree of dehydration	At least two of the following signs: - Restless, irritable - Sunken eyes - Drinks avidly, with thirst - Pinch test: skin returns very slowly to previous state
	Diarrhea -- not dehydrated	There are not sufficient signs to classify the case as “Some Degree of Dehydration” or “Serious Dehydration”
	Serious Persistent Diarrhea (diarrhea for more than 14 days)	Dehydration
	Persistent Diarrhea (diarrhea for more than 14 days)	No dehydration
	Dysentery	Blood in the feces
Under 2 months	Diarrhea with serious dehydration	At least two of the following signs: - Lethargic or unconscious - Sunken eyes - Pinch test: skin returns very slowly to previous state
	Diarrhea with some degree of dehydration	At least two of the following signs: - Restless, irritable - Sunken Eyes - Pinch test: skin returns very slowly to previous state
	Diarrhea – not dehydrated	There are not sufficient signs to classify the case as “Some Degree of Dehydration” or “Serious Dehydration”
	Serious persistent diarrhea	Diarrhea for more than 14 days
	Dysentery	Blood in the feces

Sample Size

Acute Respiratory Infections

The number of children diagnosed with an acute respiratory infection who should be incorporated into the study should be determined based on an estimate of how many nasopharyngeal secretions will test positive for the two bacteria being studied: *Streptococcus pneumoniae* and *Haemophilus influenzae,* and taking into account the expected prevalence of bacterial resistance. The steps and methodology for calculating the size of the study sample are described in the section on estimate studies for the Statistical Methodology Support Module in Part II. For the study, one can assume absolute precision of 5% and reliability of 95%.

Diarrhea

For the study on diarrheal diseases, 3800 children should be incorporated, since different agents will be evaluated; the safest option will therefore be taken — resistance prevalence of 50%. The rate of isolation of bacterial germs among the diarrheal diseases investigated is 10%.

Study period

The research will be conducted during the period of high incidence of respiratory and diarrheal diseases, according to each region's characteristics.

The following forms must be completed for each child admitted to the study:

Consent form from the child's guardian
Forms to collect information on the child (Annexes 58.A and 58.B)
Form to interview the guardian on the child's history (Annex 58.C)

Clinical samples

Collecting clinical samples is an important step in isolating and identifying the bacterial agents responsible for pneumonias and diarrheal diseases. The sample must always be collected before antimicrobial treatment is initiated.

The samples for the study on *Streptococcus pneumoniae* and *Haemophilus influenzae* will be nasopharyngeal secretions of children diagnosed with an acute respiratory infection. For the nasopharyngeal sampling and the isolation and identification of bacterial agents, the methodology outlined in the WHO/Centers for Disease Control Manual will be used: World Health Organization, Geneva and Centers for Disease Control, Atlanta. Manual for the National Surveillance of Antimicrobial Resistance of *S. pneumoniae* and *H. Influenzae.* Epidemiological and Microbiological Methods. Revised Field Test Version, August 1994.

Sensitivity to antibiotics commonly used for respiratory infections can be tested: penicillin, cotrimoxazole, erythromycin, gentamicin, and chloramphenicol. In the locations with a reference laboratory with capacity for Minimum Inhibitory Concentrations, the strains resistant to the disk test can be derived for evaluation as "moderately resistant" or "highly resistant."

For the sampling and identification of causative agents of diarrheal diseases, the methodology in the WHO Manual for laboratory research on acute gastrointestinal infections will be used, document WHO/CDD 83.3 (1987), Rev.1.

The antibiotics to be used to test the resistance of germs that cause diarrheal diseases are: ampicillin, cotrimoxazole, nalidixic acid, chloramphenicol, and tetracycline. Other antibiotics commonly used in the region can be added.

Data processing

A database will be prepared based on the data collected utilizing Epi Info or another similar program to analyze the variables obtained. Based on this information, indicators can be prepared on the proportion of strains resistant to the bacterial agents that cause pneumonia and diarrheal diseases. Table 58.3 presents some indicators by way of example. These indicators can be determined for each age group and other variables of interest.

TABLE 58.3

INDICATOR	NUMERATOR	DENOMINATOR
Percentage of cases of acute respiratory infections with isolation of *S. pneumoniae* and *H. Influenzae*	Total number of strains of *S. pneumoniae* and *H. Influenzae* isolated	Total number of children with acute respiratory infections studied
Percentage of cases of diarrheal diseases with isolation of *Shigella*	Total number of strains of *Shigella* isolated	Total number of children with diarrhea studied
Percentage of cases of diarrheal diseases with isolation of Salmonella	Total number of strains of Salmonella isolated	Total number of children with diarrhea studied
Percentage of cases of diarrheal diseases with isolation of *Vibrio cholerae*	Total number of strains of *Vibrio cholerae* isolated	Total number of children with diarrhea studied
Percentage of *S. pneumoniae* strains resistant to penicillin	Number of *S. pneumoniae* strains resistant to penicillin	Total number of *S. pneumoniae* strains isolated
Percentage of *Shigella* strains resistant to every antibiotic (repeat for each bacteria and antibiotic)	Number of *Shigella* strains resistant to every antibiotic	Number of Shigella strains isolated

ANNEX 58.A
CHART FOR COLLECTING DATA ON CHILDREN UNDER 5 WITH DIARRHEA

Chart Number: _____ Place and Date: _____

Child's identification data:			
Child's surname and name:			
Age: [____] Sex: [____] Date of consultation/hospitalization: ____/____/____			
Main classification/diagnosis:			
Other classifications/diagnoses:			
Child's address:			
Clinical picture at time of consultation:			
Children ages 2 months to 4 years			
Lethargic or unconscious	Yes [__] No [__]	No information [__]	
Sunken eyes	Yes [__] No [__]	No information [__]	
Drinking poorly or inability to drink	Yes [__] No [__]	No information [__]	
Pinch test: the skin returns very slowly to its previous state	Yes [__] No [__]	No information [__]	
Restless and irritable	Yes [__] No [__]	No information [__]	
Drinks avidly, with thirst	Yes [__] No [__]	No information [__]	
Blood in feces	Yes [__] No [__]	No information [__]	
Children under 2 months			
Lethargic or unconscious	Yes [__] No [__]	No information [__]	
Sunken eyes	Yes [__] No [__]	No information [__]	
Pinch test: the skin returns very slowly to its previous state	Yes [__] No [__]	No information [__]	
Restless and irritable	Yes [__] No [__]	No information [__]	
Blood in feces	Yes [__] No [__]	No information [__]	
Other studies, examinations, etc.			
Where was the child born? Hospital [___] Residence [___] Other: _____ Birthweight [_____]			
Is the child currently being breast-fed exclusively?	Yes [__] No [__]		
How long was the child breast-fed?			
At what age did the child begin to receive food other than breast milk?			
Do you have the child's vaccination card?	Yes [__] No [__]		
Are vaccinations current?	Yes [__] No [__]		
Do you have the child's growth chart?	Yes [__] No [__]		
Are checkups current?	Yes [__] No [__]		
When was the child's last checkup?			
Has the child had another diarrheal disease in the last 6 months?	Yes [__] No [__]		

Time of the episode	Episode 1 [ ]	Episode 2 [ ]	Episode 3 [ ]
Diagnosis			
Was the child hospitalized?	Yes [__] No [__]	Yes [__] No [__]	Yes [__] No [__]
	How long? [_____]	How long? [_____]	How long? [_____]
Did the child receive antibiotics to treat this episode of diarrhea?	Yes [__] No [__] Which ones?	Yes [__] No [__] Which ones?	Yes [__] No [__] Which ones?

ANNEX 58.B
CHART FOR COLLECTING DATA ON CHILDREN UNDER 5 WITH ACUTE RESPIRATORY INFECTION

Chart Number.: _____ Place and Date: _____

Child's identification data:			
Child's surname and name:			
Age: [____] Sex: [____] Date of consultation/hospitalization: ____/____/____			
Main classification/diagnosis:			
Other classifications/diagnoses:			
Child's address:			
Clinical picture at time of consultation:			
Children ages 2 months to 4 years:			
Cough	Yes [__] No [__]	No information [__]	
Central cyanosis	Yes [__] No [__]	No information [__]	
Inability to drink	Yes [__] No [__]	No information [__]	
Subcostal indrawing	Yes [__] No [__]	No information [__]	
Fast breathing	Yes [__] No [__]	No information [__]	
Children under 2 months:			
Stopped feeding well	Yes [__] No [__]	No information [__]	
Convulsions	Yes [__] No [__]	No information [__]	
Abnormally sleepy or difficult to awaken	Yes [__] No [__]	No information [__]	
Stridor in child at rest	Yes [__] No [__]	No information [__]	
Fever (38°C or more) or low body temperature (less than 35.5°C)	Yes [__] No [__]	No information [__]	
Wheezing	Yes [__] No [__]	No information [__]	
Diagnostic studies			
Chest x-ray	Yes [__] No [__]	No information [__]	
Findings:			
Other studies, examinations, etc.			
Where was the child born? Hospital [___] Residence [___] Other: _____ Birthweight [_____]			
Is the child currently being breast-fed exclusively?	Yes [__] No [__]		
How long was the child breast-fed?			
At what age did the child begin to receive food other than breast milk?			
Do you have the child's vaccination card? Yes [__] No [__]	Are vaccinations current? Yes [__] No [__]		
Do you have the child's growth chart?	Yes [__] No [__]		
Are checkups current?	Yes [__] No [__]		
When was the child's last checkup?			
Has the child had a respiratory illness in the last 6 months?	Yes [__] No [__]		

Time of the episode	Episode 1 [ ]	Episode 2 [ ]	Episode 3 [ ]
Diagnosis			
Was the child hospitalized?	Yes [__] No [__]	Yes [__] No [__]	Yes [__] No [__]
	How long? [_____]	How long? [_____]	How long? [_____]
Did the child receive antibiotics to treat this episode of diarrhea?	Yes [__] No [__] Which ones?	Yes [__] No [__] Which ones?	Yes [__] No [__] Which ones?

ANNEX 58.C
INTERVIEW CHART FOR THE PARENTS OF CHILDREN UNDER 5

Chart Number.: _____ Place and Date: _____

Child's identification data:
Child's surname and name:
Age: [____] Sex: [____] Date of consultation/hospitalization: ____/____/____
Classification/diagnosis:
Child's address:
Do any other family members currently have a respiratory illness? Yes [__] No [__]
Who diagnosed it?
Characteristics of the family (living in the same residence):
Mother's level of education: Primary [__] Years [___] Secondary [__] Years [___] Postsecondary [___]
Father's level of education: Primary [__] Years [___] Secondary [__] Years [___] Postsecondary [___]
Level of education of the child's caretaker: Primary [__] Years [___] Secondary [__] Years [___] Postsecondary [___]
Characteristics of the home: Urban [___] Rural [___] Number of rooms: [___]
Indoor plumbing Yes [__] No [__] Bath: Yes [__] No [__]] Latrine: Yes [__] No [__]
Eating area Yes [__] No [__]
No. of people sleeping in each room [_____] | No. of people who sleep with the child [_____]
Sanitary conditions of the peridomiciliary area Good [____] Fair [____] Poor [____]
Characteristics of family health care
Checkups during last pregnancy? Yes [__] No [__]
Health center [___] Hospital [___] Other: _____
Has a Prenatal Card? Yes [__] No [__]
Early checkup Yes [__] No [__]
Periodic Yes [__] No [__]
Dynamic of the family and the child's care
Work Father Yes [__] No [__] Outside the home? Yes [__] No [__] Hours [_____]
Mother Yes [__] No [__] Outside the home? Yes [__] No [__] Hours [_____]
Observations:

PROTOCOL 59

EVALUATING THE EFFICIENCY OF THE IMCI STRATEGY IN HEALTH SERVICES

INTRODUCTION

The main purpose of an evaluation is to determine whether or not the proposed objectives are being met in the implementation of a plan. It also identify problems that have prevented results from being achieved and provides the foundation for reprogramming future activities or modifying the proposed strategy. It is a systematic way to improve and account for public health actions.

An evaluation can include elements related to the execution of the plan's activities, the results obtained based on the execution of those activities, and the impact on the problem. Likewise, the evaluation will have to include the cost of implementing the strategy and its relation to the achievements made.

The IMCI strategy was prepared based the latest knowledge of diseases that most frequently affect children under 5. The signs and symptoms that have the greatest predictive value for early detection of each disease are used for clinical assessment and case classification.

According to the World Bank, the IMCI strategy has the greatest potential impact on reducing the burden of disease, disability and death in the children, as well as the best cost-benefit ratio. For this reason, developing countries in the Region of the Americas and international organizations and agencies have decided to strengthen and support the implementation of this strategy in the coming years.

OBJECTIVES

- To determine the cost of implementing the IMCI strategy in a local health service.

- To evaluate the benefits of implementing the IMCI strategy in terms of enhanced quality of health care for children in health services and their relation to implementation costs.

METHODOLOGY

One or more health services should be selected to be evaluated before and after the IMCI strategy is implemented.

Implementation of the IMCI strategy implies that:

- Health service personnel is trained on the theoretical and practical content of applying the strategy, preferably from having attended an IMCI clinical course.

- The health services where the trained staff works have the supplies needed to implement the strategy.

- Health workers have the opportunity to analyze problems, difficulties, and questions on

proper implementation of the IMCI strategy, through follow-up visits after the training, and direct and indirect periodic supervision.

- The community that goes to the health service has access to educational activities —interpersonal activities during the consultation (or before or after) and group activities in the community, through talks, meetings, and other similar events.

Fulfillment of the requirements is essential for conducting the study, otherwise potential shortfalls in terms of impact will not be related to the results of the strategy, but rather to the deficiencies in its implementation.

For objective one, the form in Annex 59.A should be utilized: *List of Components of the Cost of Implementing the Integrated Management of Childhood Illness Strategy in Local Health Services.*

That form describes the items needed for health services to provide access to the IMCI strategy. The form is to be filled out as follows:

1. Complete the costs section by ascertaining the prices of each item, whether the service has them or not. This will indicate how much capital needs to be invested to have all the necessary elements for applying the IMCI strategy. This should include:

   1.1. Capital goods that require a one-time investment or at least one lasting investment, taking into account depreciation, such as a scale, refrigerator, etc.

   1.2. Necessary consumer goods, such as drugs, disposable materials for vaccines or injecting drugs, etc. For this, one must calculate the number of children attended — for example in hundreds.

This calculation should be made based on two scenarios:

- What the current situation is, by reviewing records and the application (or not) of standards for pathologies, such as ARI and diarrhea.

- What would be needed to effectively apply the IMCI strategy.

2. Complete the cost section on what has to be invested for the remaining categories, for example, training and monitoring.

3. Other costs, such as overall operating expenses (power, telephone, paper, etc.) and wages.

Thus, by determining the cost of caring for 100 children, for example, the following indicators can be calculated:

- *cost per child of current care in the health services*

- *investment to be made to implement the IMCI strategy in those health services*

- *cost per child of care following the implementation of the IMCI strategy*

These indicators must be analyzed both globally and separately, according to the component of health service's expenditure since, as mentioned earlier, there are fixed costs that will not change with the implementation of the strategy, while others do not require regular investments, and still others are based on consumption, such as drugs.

For objective two, the benefits of applying the IMCI strategy should be evaluated in terms of optimum quality of health care for children in the health services, using the following indicators.

1. Reduced frequency of serious cases among children under 5 who are brought by their mother and caretaker to the health services.

2. A decline in the use of radiology to diagnose ARI and a drop in stool analyses for diarrhea (as well as other complementary diagnostic studies) which are often overused or the results for which arrive late and are not analyzed for diagnosis and treatment.

3. A drop in the unnecessary use of antibiotics for ARI and diarrhea case management.

4. A reduction in the use of drugs that are useless for treating ARI and diarrhea, such as cough syrups and antidiarrheal drugs.

5. A drop in referrals from primary care services to hospitals for treatment of ARI, diarrhea, and malaria cases.

6. A drop in hospital discharges for pneumonia, diarrhea, malaria, and malnutrition, by diminishing the occurrence of serious cases and increasing the resolution of cases that consult primary care services.

7. A shift in the profile of hospitalizations of children under 5, reducing the number and percentage of ARI and diarrhea cases, so that out of total cases hospitalized there are fewer that could be treated on an outpatient basis and more severe cases, i.e. a drop in hospitalizations that are not clinically justified.

8. A drop in the hospital case-fatality rate from pneumonia, diarrhea, and malaria since the cases that require hospital treatment are detected earlier and are less serious.

Protocols for proposed epidemiological and operational studies will be implemented to obtain and evaluate these indicators.

An estimate of the ratio of investment to results achieved can be evaluated based on indicators like those in Table 59.1. These indicators can be broken down by type of health problem, age, and other variables to evaluate the components of the strategy.

TABLE 59.1

INDICATOR	NUMERATOR	DENOMINATOR
Cost per serious case prevented	Cost of implementing the strategy in the health services	Estimated number of consultations where serious cases were prevented in the population that has access to health services
Cost per hospital death prevented	Cost of implementing the strategy in the health services	Estimated number of hospital deaths prevented

ANNEX 59.A
List of Components of the Cost of Implementing the Integrated Management of Childhood Illness Strategy in Local Health Services

No. of Units Cost per Unit Total

COST COMPONENT	NUMBER OF UNITS	COST PER UNIT	TOTAL
1. Clinical staff training			
1.1. Per diem for 14 days (or room and board for 14 days)			
1.2. Round-trip transportation to and from the course site			
1.3. Replacement of the person in his/her regular job for 10 days			
1.4. 1/4 of the cost of 1 course facilitator			
1.4.1. Per diem for 14 days (or room and board for 14 days)			
1.4.2. Round-trip transportation to and from the course site			
1.4.3. Replacement of the person in his/her regular job for 10 days			
1.5. Set of modules for the course			
1.6. Tables of IMCI Procedures			
1.7. Photo album			
1.8. School supplies (notebook, pencil, file, scrap paper, pen)			
1.9. Gown/scrubs for the clinical practice			
1.10. Set of basic reference materials			
1.11. Fraction of the cost of the equipment and supplies at the course site (TV, VCR, flipcharts, videotapes)			
2. Training staff in interpersonal communication			
2.1. Per diem for 3 days (or room and board for 3 days)			
2.2. Round-trip transportation to and from the course site			
2.3. Replacement of the person in his/her regular job for 10 days			
2.4. 1/4 of the cost of 1 course facilitator			
2.4.1. Per diem for 3 days (or room and board for 3 days)			
2.4.2. Round-trip transportation to and from the course site			

COST COMPONENT	NUMBER OF UNITS	COST PER UNIT	TOTAL
2.4.3. Replacement of the person in his/her regular job for 3 days			
2.5. Set of modules for the course			
2.6. School supplies (notebook, pencil, file, scrap paper, pen)			
2.7. Fraction of the cost of the equipment and supplies at the course site (TV, VCR, flipcharts, videotapes)			
3. Follow-up visit			
3.1. Per diem for 1_ days for two people (or food for two people for 1 day and possibly lodging)			
3.2. Round-trip visit for two people from the site to the health services			
3.3. Post-training follow-up guide (1 per service)			
3.4. Fraction of office supplies (notebook, pencil, file, scrap paper, pen); 1 set for every 20 visits			
3.5. Fraction of the cost of the two people who conduct the post-training follow-up (1_ working days per person trained)			
4. Periodic supervisory visit			
4.1. Per diem for 1 day for one person (or food for one person for 1 day and possibly lodging), twice per year			
4.2. Round-trip visit for one person from the site to the health services twice a year			
4.3. Supervision guide (1 per service, twice per year)			
4.4. Fraction of office supplies (notebook, pencil, file, scrap paper, pen); 1 set for every 20 visits			
4.5. Fraction of the cost of the two people who conduct the post-training follow-up (1_ working days per person trained)			
5. Provision of inputs for each health service			
5.1. Scale for adults			
5.2. Pediatric scale			
5.3. Pediatric meter			
5.4. Height meter			
5.5. Refrigerator and thermometer for cold chain control			
5.6. Stethoscope (1 per pediatrician's office)			
5.7. Otoscope (1 per pediatrician's office)			

COST COMPONENT	NUMBER OF UNITS	COST PER UNIT	TOTAL
5.8. Clock with minute hand (1 per pediatrician's office)			
5.9. Flashlight (1 per pediatrician's office)			
5.10. Thermometer for body temperature (1 per pediatrician's office)			
5.11. Glass (1 per pediatrician's office)			
5.12. Spoon (1 per pediatrician's office)			
5.13. 1 liter bottle			
5.14. Batteries for flashlight and otoscope (4 every 3 months per instrument)			
5.15. Examination table (1 per pediatrician's office)			
5.16. 3 chairs (per pediatrician's office)			
5.17. Fraction of office supplies (notebook, pencil, file, scrap paper, pen); 1 set for every 20 visits			
5.18. Drugs			
5.19. Vaccines			
5.20. Consultation registry elements			
5.21. Prescription pads			
5.22. Instruction cards for the mother			
5.23. Educational pamphlets			
5.24. Posters (1 per pediatrician's office + 1 set for the service)			
6. Organization, planning, and evaluation			
6.1. 1/2 day per week devoted to these aspects			
6.2. 1 day every 3 months for coordination, evaluation, and planning meetings, etc.			
6.3. 1 day of per diem			
6.4. Round-trip transportation to and from area headquarters			

PROTOCOL 60

INVESTIGATION OF CAUSES OF DEATH IN CHILDREN AGES 1 WEEK TO 4 YEARS TO IDENTIFY RISK FACTORS AND PREVENTABLE CAUSES.

INTRODUCTION

The majority of deaths in children under 5 occur in developing countries. Acute respiratory infections and diarrheal diseases are two of the leading causes. Other health problems, such as vaccine-preventable diseases and, in some areas, malaria, also drive up the number of deaths in children under 5. Frequent complications from ARI and diarrheal diseases, such as septicemia and meningitis, and risk factors like malnutrition and anemia also cause a considerable number of deaths.
All these illnesses and risks factor contribute to the majority of deaths in children under 5 in developing countries, as well as most children visits and hospitalizations in health services in these same countries. Controlling these problems is therefore one of the main challenges in achieving a sustained reduction in infant mortality.

The IMCI strategy is aimed at reducing the incidence and severity as well as mortality from childhood illnesses in children ages 1 week to 5 years. Parents do not generally bring children under one week of age to primary health care services, but rather directly to the hospital. Problems in that age group, which are mostly related to delivery and birth, require specialized care and cannot be managed by personnel at the first level of care.

Many hospitalizations and deaths of children under 5 can be prevented by bringing these children to health services in time to receive the necessary treatment.

The IMCI strategy increases the knowledge of parents and other caregivers of children under 5 about dangerous signs indicating their need to seek care outside the home. The strategy also improves primary health care services' and health worker knowledge to classify, and treat children who come in for care.

An analysis of the different issues that come into play in caring for a child is extremely important for programmatic actions to be taken place and control the problem.

OBJECTIVE

To identify factors that have an impact on the death of children ages 1 week to 4 years, related to the aspects of disease detection, care in the home, and quality of care.

METHODOLOGY

Population to be studied

The study population consists of the mothers of children under 5 who died in a specific geographical area. That area should have health services that cover that specific territory, particularly referral hospitals.

The information for the study will be obtained by:

- Surveying the mothers of children who died of one of these common childhood diseases and getting information if the death occurred at home and if care was sought outside the home, among other elements.

- Reviewing health center records where the child was attended.

The total number of deaths in children under 5 that occur in the area in a given period should be obtained. These deaths can be broken down by the place where the death occurred and whether or not care had been provided first — in a service or by health workers or nonmedical personnel – for the disease that caused the death.

Deaths can also be broken down by medical diagnosis (or classification in the case of nonmedical health workers), such as pneumonia, bronchitis, bronchiolitis, diarrhea, malnutrition, malaria, meningitis, septicemia, etc.

If good death records are available with limited underreporting, information on the total number of deaths in children under 5, the cause of death, and the place of death can be obtained based on a review of registered death certificates.

Generally, there is inadequate recording of mortality in areas with a high number and percentage of deaths in the home. The methodology for obtaining the necessary information in this type of situation is as follows:

Review the deaths recorded in the Civil Registry corresponding to children under 5 in the area of study from the causes being studied.

- Review of the records of hospitals and health centers to which the area's population has access. Care should be taken to identify all deaths in the study area, since some may have occurred in other hospitals if children were referred from the health services in the area because of severity of the case or for other reasons.

- Information from different community sources to determine the occurrence of deaths in children under 5 during the study period. These sources may include interviews with peo-

ple who have this type of data, such as religious leaders, cemetery officials, community health workers, traditional healers, community representatives, etc.

Once the address of the children under 5 is identified, a house call will be made to interview the mother using the questionnaire in Annex 60.A, which is based on the oral autopsy questionnaires used by the BASICS Project to investigate and identify causes of deaths in children under 5.

This questionnaire consists of several parts, including:

1. Identification data
2. Oral autopsy
3. General data on the family and the deceased child
4. Progress of the disease
5. Research in the health services

Based on the interview records, the following is recommended:

- Evaluate the mother's knowledge to detect the disease that caused the child's death and its signs of severity. This component is evaluated through the oral autopsy.

- Evaluate the characteristics of the child's care in the home, home remedies, care sought outside the home, and fulfillment of health worker recommendations.

- Evaluate characteristics of the children's health care in the health services, clinical case evaluation, treatment, and referral of serious cases.

Once all the interviews are complete, the information obtained must be analyzed. A computer database program such as Epi Info can be used to process the data. Thus the analysis can be based on different combinations of the variables obtained.

The data collected can be used to calculate the indicators on characteristics of the deaths in children of every age group that occurred in the study area. Table 60.1 gives examples of indicators that can be estimated.

TABLE 60.1

INDICATOR	NUMERATOR	DENOMINATOR
Percentage of deaths at home from any cause in children under 5	Number of deaths at home from any cause in children under 5	Total number of deaths from any cause in children under 5
Percentage of deaths from pathologies prevalent in children under 5 in which the mother did not follow through with the referral to the hospital	Number of deaths from pathologies prevalent in children under 5 in which the mother did not follow through with the referral to the hospital	Total number of deaths from pathologies prevalent in children under 5 that were investigated
Percentage of deaths from ARI in children ages 2 to 11 months in which the mother did not recognize the danger signs	Number of deaths from ARI in children ages 2 to 11 months in which the mother did not recognize the danger signs	Total number of deaths from ARI in children ages 2 to 11 months that were investigated
Percentage of deaths from childhood illness in children under 1 who did not have the complete series of vaccinations	Number of deaths by IMCI in children under 1 who did not have the complete series of vaccinations	Total number of deaths by IMCI in children under 1 that were investigated
Percentage of deaths from childhood illness in children under 1 who were not classified correctly in the health services	Number of deaths from childhood illness in children under 1 who were not classified correctly in the health services	Total number of deaths by IMCI in children under 1 attended in health services that were investigated
Percentage of deaths from childhood illness in children under 1 in whom the treatment given in the health services was not consistent with the standard	Number of deaths from childhood illness in children under 1 in whom the treatment given in the health services was not consistent with the standard	Total number of deaths by IMCI in children under 1 attended in health services

ANNEX 60.A

QUESTIONNAIRE FOR THE AUDIT OF DEATHS IN CHILDREN

1. IDENTIFICATION DATA

Interview number [ ]

Interviewer _____

Date of interview: [ ] day [ ] month [ ] year

Name of child:……..

Sex: 1 Male[ ] 2 Female [ ] Age [ ] years [ ] months [ ] days

Address: _____

Referral site: _____

Death reported by: _____

2. VERBAL AUTOPSY

Open History

Could you briefly tell me about the disease that caused your child's death?
Ask: "Was there anything else?"

Make it possible for the person to tell everything he/she knows about the disease in his/her own words.
Only ask: "Was there anything else?"

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

2.1. Did the child die from an accident?

1 YES (Skip to question 2.1.1) [ ]
2 NO (Skip to question 2.2 or 2.3) [ ]

2.1.1 If YES, the child died from an accident or injury, ask "what type of accident or injury was it?"

1	TRAFFIC ACCIDENT	[ ]
2	FALL	[ ]
3	ACCIDENTAL IMMERSION	[ ]
4	POISONING	[ ]
5	INSECT/POISONOUS ANIMAL BITE	[ ]
6	BURN	[ ]
7	VIOLENCE	[ ]
8	SELF-INFLICTED INJURY	[ ]
9	HOMICIDE	[ ]
10	OTHER	[ ]
	SPECIFY: _____	

2.1.2 Did the child die within 24 hours of the accident or injury?

1	YES	[ ]
2	NO	[ ]
9	DON'T KNOW	[ ]

IF THE CHILD WAS OVER ONE MONTH OF AGE SKIP TO 2.3.

2.2 Neonatal Period

2.2.1. Do you remember the date of your last menstruation? (this pregnancy)

[ ] day [ ] month [ ] year

2.2.2. Was the child a twin?

1	YES	[ ]
2	NO	[ ]

2.2.3. Was the child born early, on time, or late?

1	EARLY	[ ]
2	ON TIME	[ ]
3	LATE	[ ]
9	DON'T KNOW	[ ]

2.2.4. Was the pregnancy or childbirth complicated?

1	YES	[ ]
2	NO	[ ]
9	DON'T KNOW	[ ]
	(If YES or DON'T KNOW skip to question 2.2.5)	

If the response was YES, ask: “What complications did you have during pregnancy or childbirth?”

2.2.4.1	THE MOTHER HAD CONVULSIONS	[ ]
2.2.4.2	THE CHILD WAS BORN BREACH	[ ]
2.2.4.3	THE MOTHER BLED TOO MUCH IN DELIVERY	[ ]
2.2.4.4	THREAT OF MISCARRIAGE	[ ]
2.2.4.5	EMERGENCY CAESAREAN SECTION	[ ]
2.2.4.6	MULTIPLE DELIVERY	[ ]
2.2.4.7	OTHER, SPECIFY _____	

2.2.5 How many months did the pregnancy last ? [ ] Months

2.2.6 Did your water break before the beginning of delivery?

1	YES	[ ]
2	NO	[ ]
9	DON’T KNOW	[ ]

(If NO or DON’T KNOW skip to question 2.2.7)

2.2.6.1 If her water broke before delivery, ask:
“How long before delivery did your water break?”

1	Less than 1 day	[ ]
2	More than one day	[ ]
9	Don’t know	[ ]

2.2.7 How long was your delivery?

1	Less than 12 hours	[ ]
2	More than 12 hours	[ ]
9	Don’t know	[ ]

2.2.8 Did the child have marks or bruises on the body or head?

1	YES	[ ]
2	NO	[ ]
9	DON’T KNOW	[ ]

2.2.9 Did the child have some malformation?

1	YES	[ ]
2	NO	[ ]
9	DON’T KNOW	[ ]

(If NO or DON’T KNOW skip to question 2.2.10)

If she answered YES to malformations, ask: "Where was the malformation?"

2.2.9.1 HEAD [ ]
2.2.9.2 BODY [ ]
2.2.9.3 ARMS [ ]
2.2.9.4 LEGS [ ]
2.2.9.5 OTHER [ ]

2.2.10 What size was the child when was it born?

1 VERY SMALL [ ]
2 SMALLER THAN NORMAL [ ]
3 AVERAGE [ ]
4 LARGER THAN NORMAL [ ]

2.2.11 When the child was born could it breathe?

1 YES SPONTANEOUSLY [ ]
2 NO [ ]
9 DON'T KNOW [ ]

2.2.12 Was the first breast-feeding normal?

1 YES [ ]
2 NO [ ]
3 NOT APPLICABLE [ ]
Specify_____
9 DON'T KNOW [ ]

2.2.13 Did you stop breast-feeding at some point?

1 YES [ ]
2 NO [ ]
9 DON'T KNOW [ ]
(If NO or DON'T KNOW skip to question 2.2.14)

2.2.13.1 If she answered YES, the child stopped breast-feeding at some point, ask: "How long before the child died did you stop breast-feeding?"

1 LESS THAN A DAY [ ]
2 MORE THAN ONE DAY [ ]
9 DON'T KNOW [ ]

2.2.13.2 If she answered YES, the child stopped breast-feeding at some point, ask: "How long after birth did you stop breast-feeding?"

1 LESS THAN 1 DAY [ ]
2 1 OR 2 DAYS [ ]
3 3 TO 7 DAYS [ ]
4 8 TO 14 DAYS [ ]
5 15 TO 30 DAYS [ ]
9 DON'T KNOW [ ]

2.2.14 Did the child cry at birth?

1 YES [ ]
2 NO [ ]
9 DON'T KNOW [ ]

2.2.15 Was his/her crying weaker at any point?

1 YES [ ]
2 NO [ ]
9 DON'T KNOW [ ]
(If NO or DON'T KNOW skip to question 2.2.16)

2.2.15.1 If YES, ask:
How long before his/her death did the child begin to have a weaker cry?

1 LESS THAN A DAY [ ]
2 MORE THAN ONE DAY [ ]

2.2.16 During the disease that caused the death, did the child have attacks or convulsions?

1 YES [ ]
2 NO [ ]
9 DON'T KNOW [ ]

2.2.17 During the first three days of life was the child unresponsive or flaccid?

1 YES [ ]
2 NO [ ]
9 DON'T KNOW [ ]

2.2.18 During the disease that caused the death, did the child have a hard or swollen fontanel?

1 YES [ ]
2 NO [ ]
9 DON'T KNOW [ ]

2.2.19 During the disease that caused the death, did the child's body become rigid or taut?

1 YES [ ]
2 NO [ ]
9 DON'T KNOW [ ]

2.2.20 Did the mother receive two or more doses of tetanus toxoid?

1 YES [ ]
2 NO [ ]
9 DON'T KNOW [ ]

2.2.21 During the disease that caused the death, did the navel get red or begin to pus?

1 YES [ ]
2 NO [ ]
9 DON'T KNOW [ ]

2.2.22 What was used to cut the umbilical cord?

1 STERILE INSTRUMENT [ ]
2 PROBABLY A CLEAN INSTRUMENT [ ]
3 PROBABLY A DIRTY INSTRUMENT [ ]
4 DIRTY INSTRUMENT [ ]
5 OTHER [ ]

Specify _____

2.2.23 What was used to tie the umbilical cord?

1 STERILE TAPE [ ]
2 PROBABLY CLEAN TAPE [ ]
3 PROBABLY DIRTY TAPE [ ]
4 DIRTY TAPE [ ]
5 WAS NOT TIED [ ]

2.2.24 During the disease that caused the death, did the child have tetanus?

1 YES [ ]
2 NO [ ]
9 DON'T KNOW [ ]

2.2.25 During the disease that caused the death, did the child have yellow eyes or skin?

1 YES [ ]
2 NO [ ]
9 DON'T KNOW [ ]

2.2.26 During the disease that caused the death, did the child's skin have red or hot spots?

1 YES [ ]
2 NO [ ]
9 DON'T KNOW [ ]

2.2.27 During the disease that caused the death, did the child have pustules?

1 YES [ ]
2 NO [ ]
9 DON'T KNOW [ ]

2.2.28 During the disease that caused the death, did the child have a fever?

1 YES [ ]
2 NO [ ]
9 DON'T KNOW [ ]

(If NO or DON'T KNOW skip to question 2.2.29)

2.2.30 During the disease that caused the death, was the child's dirty diaper more watery than usual?

1 YES [ ]
2 NO [ ]
9 DON'T KNOW [ ]

2.2.31 During the disease that caused the death, did the child have diarrhea?

1 YES [ ]
2 NO [ ]
9 DON'T KNOW [ ]

If NO or DON'T KNOW skip to question 2.2.32

2.2.31.1 How many days did the diarrhea last? [ ] days

2.2.31.2 Was there blood in the dirty diaper?

1 YES [ ]
2 NO [ ]
9 DON'T KNOW [ ]

2.2.31.3 How many times did the child have a dirty diaper on the worst day? [ ] times

2.2.31.4 Do you think that the dirty diapers were more frequent than normal?

1 YES [ ]
2 NO [ ]
9 DON'T KNOW [ ]

2.2.31.5 Did the child have diarrhea until he/she died?

1 YES [ ]
2 NO [ ]
9 DON'T KNOW [ ]

2.2.31.6 Did the child have any of the following signs?

2.2.31.6.1 DRY MOUTH
1 YES [ ]
2 NO [ ]
9 DON'T KNOW [ ]
2.2.31.6.1 THIRST
1 YES [ ]
2 NO [ ]
9 DON'T KNOW [ ]
2.2.31.6.1 DRY SKIN
1 YES [ ]
2 NO [ ]
9 DON'T KNOW [ ]
2.2.31.6.1 SUNKEN EYES
1 YES [ ]
2 NO [ ]
9 DON'T KNOW [ ]

2.2.32 During the disease that caused the death, did the child have a cough?

1 YES [ ]
2 NO [ ]
9 DON'T KNOW [ ]
(If NO or DON'T KNOW skip to question 2.2.33)

2.2.32.1 If YES, the child had a cough, ask:
How many days did the cough last? [ ] days

2.2.33 During the disease that caused the death, did the child have difficult breathing?

1 YES [ ]
2 NO [ ]
9 DON'T KNOW [ ]
(If NO or DON'T KNOW skip to question 2.2.34)

2.2.33.1 If YES, the child had difficult breathing, ask:
How many days did it last? [ ] days

2.2.34 During the disease that caused the death, did the child have fast breathing?

1 YES [ ]
2 NO [ ]
9 DON'T KNOW [ ]
(If NO or DON'T KNOW skip to question 2.2.35)

2.2.34.1 If YES, the child had fast breathing, ask:
How many days did it last? [ ] days

2.2.35 During the disease that caused the death, did the child stop breathing for long periods then begin again?

1 YES [ ]
2 NO [ ]
9 DON'T KNOW [ ]

2.2.36 During the disease that caused the death, did the child have a sunken chest?

1 YES [ ]
2 NO [ ]
9 DON'T KNOW [ ]

2.2.37 During the disease that caused the death, did the child have nasal flaring?

1 YES [ ]
2 NO [ ]
9 DON'T KNOW [ ]

2.2.38 During the disease that caused the death, did his/her lips turn purple?

1 YES [ ]
2 NO [ ]
9 DON'T KNOW [ ]

2.2.39 During the disease that caused the death, did the child have …? (demonstrate the sounds)

2.2.39.1 Stridor

1 YES [ ]
2 NO [ ]
9 DON'T KNOW [ ]

2.2.39.2 Moan

1 YES [ ]
2 NO [ ]
9 DON'T KNOW [ ]

2.2.40 Did the child have pneumonia?

1 YES [ ]
2 NO [ ]
9 DON'T KNOW [ ]

2.2.41 Did the child receive a birth certificate?

1 YES [ ]
2 NO [ ]
9 DON'T KNOW [ ]
(If NO or DON'T KNOW skip to question 2.2.42)

2.2.41.1 If YES, the child received a birth certificate, ask:
Who issued the birth certificate? _____

2.2.42 Did the child receive a death certificate?

1 YES [ ]
2 NO [ ]
9 DON'T KNOW [ ]
(If NO or DON'T KNOW skip to question 2.2.43)

2.2.42.1 If YES, the child received a death certificate, ask:
Who issued the death certificate? _____

2.2.43 Where was the child buried?

1 OFFICIAL CEMETERY [ ]
2 UNOFFICIAL CEMETERY [ ]
3 AT HOME [ ]
4 IN THE COUNTRY [ ]
(Si contestó NO o NO SABE pase a la pregunta 2.2.43)

2.3 Postneonatal Period

2.3.1 During the disease that caused the death, did the child have a fever?

1 YES [ ]
2 NO [ ]
9 DON'T KNOW [ ]
(If NO or DON'T KNOW skip to question 2.4)

2.3.2 If YES, the child had a fever, ask:
How many days did the fever last? [ ] days

2.4 During the disease that caused the death, was the child's dirty diaper more watery than usual?

1 YES [ ]
2 NO [ ]
9 DON'T KNOW [ ]

2.4.1 During the disease that caused the death, did the child have diarrhea?

1 YES [ ]
2 NO [ ]
9 DON'T KNOW [ ]
(If NO or DON'T KNOW skip to question 2.2.32)

2.4.2 How many days did the diarrhea last? [ ] days

2.4.3 Was there blood in the child's dirty diaper?

1 YES [ ]
2 NO [ ]
9 DON'T KNOW [ ]

2.4.4 How many dirty diapers did the child have on the worst day? [ ]

2.4.5 Did the child have diarrhea until he/she died?

1 YES [ ]
2 NO [ ]
9 DON'T KNOW [ ]

Did the child have any of the following signs?

2.4.6 DRY MOUTH

1 YES [ ]
2 NO [ ]
9 DON'T KNOW [ ]

2.4.7 THIRST

1 YES [ ]
2 NO [ ]
9 DON'T KNOW [ ]

2.4.8 DRY SKIN

1 YES [ ]
2 NO [ ]
9 DON'T KNOW [ ]

2.4 9 SUNKEN EYES

1 YES [ ]
2 NO [ ]
9 DON'T KNOW [ ]

2.4.10 LITTLE URINATION

1 YES [ ]
2 NO [ ]
9 DON'T KNOW [ ]

2.4.11 SUNKEN FONTANEL

1 YES [ ]
2 NO [ ]
9 DON'T KNOW [ ]

2.4.12 When the child had diarrhea was he/she given liquids?

1 YES [ ]
2 NO [ ]
9 DON'T KNOW [ ]

2.5 During the disease that caused the death, did the child have a cough?

1 YES [ ]
2 NO [ ]
9 DON'T KNOW [ ]

(If NO or DON'T KNOW skip to question 2.5.17)

2.5.1 If YES the child had a cough ask:
How many days did the cough last? [ ] days

2.5.2 Was the cough very strong?

1 YES [ ]
2 NO [ ]
9 DON'T KNOW [ ]

2.5.3 Did he/she having coughing fits?

1 YES [ ]
2 NO [ ]
9 DON'T KNOW [ ]

2.5.4 Did the child vomit after coughing?

1 YES [ ]
2 NO [ ]
9 DON'T KNOW [ ]

2.5.5 When breathing in, did the child make a choking sound?

1 YES [ ]
2 NO [ ]
9 DON'T KNOW [ ]

2.5.6 Did other children have the same cough?

1 YES [ ]
2 NO [ ]
9 DON'T KNOW [ ]

2.5.7 During the disease that caused the death, did the child have difficult breathing?

1 YES [ ]
2 NO [ ]
9 DON'T KNOW [ ]
(If NO or DON'T KNOW skip to question 2.5.9)

2.5.8 If YES, the child had difficult breathing, ask:
How many days did it last? [ ] days

2.5.9 During the disease that caused the death, did the child have fast breathing?

1 YES [ ]
2 NO [ ]
9 DON'T KNOW [ ]
(If NO or DON'T KNOW skip to question 2.6)

2.5.10 If YES, the child had fast breathing, ask:
How many days did it last? [ ] days

2.5.11 During the disease that caused the death, did the child have subcostal retraction (sunken chest)?

1 YES [ ]
2 NO [ ]
9 DON'T KNOW [ ]

2.5.12 During the disease that caused the death did the child have nasal flaring?

1 YES [ ]
2 NO [ ]
9 DON'T KNOW [ ]

2.5.13 During the disease that caused the death did the child's lips turn purple?

1 YES [ ]
2 NO [ ]
9 DON'T KNOW [ ]

During the disease that caused the death, did the child have… ? (demonstrate the sounds)

2.5.14 Stridor

1 YES [ ]
2 NO [ ]
9 DON'T KNOW [ ]

2.5.15 Episodes of wheezing

1 YES [ ]
2 NO [ ]
9 DON'T KNOW [ ]

2.5.16 Did the child have pneumonia?

1 YES [ ]
2 NO [ ]
9 DON'T KNOW [ ]

2.6 Did the child have convulsions or attacks?

1 YES [ ]
2 NO [ ]
9 DON'T KNOW [ ]

2.6.1 Was the unconscious child (unresponsive) at any point?

1 YES [ ]
2 NO [ ]
9 DON'T KNOW [ ]

2.6.2 During the disease that caused the death, did the child stop eating at any point?

1 YES [ ]
2 NO [ ]
9 DON'T KNOW [ ]
(If NO or DON'T KNOW skip to question 2.6.4)

2.6.3 If YES, the child stopped eating, ask:
How long before dying did the child stop eating?

1 Less than 12 hours [ ]
2 12 hours or more [ ]

2.6.4 During the disease that caused the death, did the child stop responding to your voice?

1 YES [ ]
2 NO [ ]
9 DON'T KNOW [ ]
(If NO or DON'T KNOW skip to question 2.6.6)

2.6.5 If YES, the child stop responding to her voice, ask:

How long before dying did the child stop responding to your voice?

1 Less than 12 hours.....[ ]
2 12 hours or more .....[ ]

2.6.6 During the disease that caused the death, did the child's neck become hard? (interviewer should demonstrate)

1 YES [ ]
2 NO [ ]
9 DON'T KNOW [ ]

2.6.7 During the disease that caused the death did the fontanel become hard or swollen?

1 YES [ ]
2 NO [ ]
9 DON'T KNOW [ ]

2.6.8 During the month before the child's death, did it have pustules on the body?

1 YES [ ]
2 NO [ ]
9 DON'T KNOW [ ]

(If NO or DON'T KNOW skip to question 2.7)

2.6.9 Did the pustules cover the entire body?

1 YES [ ]
2 NO [ ]
9 DON'T KNOW [ ]

2.6.10 Were the pustules also on the face?

1 YES [ ]
2 NO [ ]
9 DON'T KNOW [ ]

2.6.11 How many days did the pustules last? [ ] days

2.6.12 Did the child have pustules full of transparent fluid?

1 YES [ ]
2 NO [ ]
9 DON'T KNOW [ ]

2.6.13 After the pustules, was the skin spotted or emaciated?

1 YES [ ]
2 NO [ ]
9 DON'T KNOW [ ]

2.6.14 Did the child have pinkeye?

1 YES [ ]
2 NO [ ]
9 DON'T KNOW [ ]

2.6.15 Did the child have a stuffy nose?

1 YES [ ]
2 NO [ ]
9 DON'T KNOW [ ]

2.6.16 Did anyone else at home have the same disease?

1 YES [ ]
2 NO [ ]
9 DON'T KNOW [ ]

2.6.17 Was the disease measles?

1 YES [ ]
2 NO [ ]
9 DON'T KNOW [ ]

2.7 During the disease that caused the death, was the child very thin?

1 YES [ ]
2 NO [ ]
9 DON'T KNOW [ ]

2.7.1 During the disease that caused the death, were the child's legs or feet swollen?

1 YES [ ]
2 NO [ ]
9 DON'T KNOW [ ]
(If NO or DON'T KNOW skip to question 2.7.3)

2.7.2 If YES, the child's legs or feet were swollen, ask:
How long did the swelling last? [ ] days

2.7.3 During the disease that caused the death was the skin emaciated?

1 YES [ ]
2 NO [ ]
9 DON'T KNOW [ ]

2.7.4 During the disease that caused the death, did the skin become reddish or yellow?

1 YES [ ]
2 NO [ ]
9 DON'T KNOW [ ]

2.7.5 Did the child have malnutrition with swelling (kwashiorkor) during the month before he/she died?

1 YES [ ]
2 NO [ ]
9 DON'T KNOW [ ]

2.7.6 Did the child have malnutrition (marasmus) during the month before he/she died?

1 YES [ ]
2 NO [ ]
9 DON'T KNOW [ ]

2.7.7 During the disease that caused the death, was the child too pale?

1 YES [ ]
2 NO [ ]
9 DON'T KNOW [ ]

2.7.8 During the disease that caused the death, did the child have pale hands?

1 YES [ ]
2 NO [ ]
9 DON'T KNOW [ ]

2.7.9 During the disease that caused the death, did the child have pale nails?

1 YES [ ]
2 NO [ ]
9 DON'T KNOW [ ]

2.7.10 Did the child receive a death certificate?

1 YES [ ]
2 NO [ ]
9 DON'T KNOW [ ]

(If NO or DON'T KNOW skip to question 2.7.12)

2.7.11 If YES, the child received a death certificate, ask:
Who issued the death certificate?…… …… ……

2.7.12 Where was the child buried?

1 OFFICIAL CEMETERY [ ]
2 UNOFFICIAL CEMETERY [ ]
3 AT HOME [ ]
4 IN THE COUNTRY [ ]
5. OTHER [ ]

Specify _____

3 GENERAL DATA ON THE FAMILY AND DECEASED CHILD

3.1 Main interviewee:
1 Mother [ ] 2 Father [ ] 3 Sibling [ ]
4 Grandparent [ ] 5 Uncle/Aunt [ ] 6 Other [ ]_____

3.2 The following persons participated in the survey:
1 Mother [ ] 2 Father [ ] 3 Sibling [ ]
4 Grandparent [ ] 5 Uncle/Aunt [ ] 6 Other [ ]_____

3.3 People who typically took care of the child:
1 Mother [ ] 2 Father [ ] 3 Sibling [ ]
4 Grandparent [ ] 5 Uncle/Aunt [ ] 6 Other [ ]_____

3. 4 Language of the interview: 1 Spanish [ ] 2 Other [ ] _____

3.5 Housing

3.5.1 Ownership
1 Own [ ] 2 Rent [ ]
3 For services [ ] 4 From family member [ ]

3.5.2 Water 1 Indoor potable water [ ]
2 Outdoor potable water [ ]
3 Non-potable water [ ]

3.5.3 Electricity 1 Yes [ ] 2 No [ ]

3.5.4 Floor 1 Wood/cement [ ] 2 Earth [ ]

3.5.5 Number of rooms [ ] rooms

3 6 Closest public service to house: _____

3 7 How long does it take to get to the health services from the house? [ ] minutes

3.8 Family

3 8.1 Parents 1 Stable union [ ] 2 Single mother [ ] 3 Single father [ ]

3.8.2 Total number of people who share housing (including the parents) [ ] people

3.8.3 Income: _____

3.9 Mother

3 9.1 Age [ ] years

3.9.2 Schooling [ ] years of schooling

3.9.3 Pregnancies [ ]

3.9.4 Deliveries [ ]

3.9.5 Abortion/miscarriages [ ]

3.9.6 Live children [ ]

3.9.7 Dead children [ ] (including the child in question)

3.9.8 Occupation _____

3.9.9 How much time did you spend with the child? [ ] hours/day

3.10 Father

3 10.1 Age [ ] years

3.10.2 Schooling [ ] years of schooling

3.10.3 Occupation _____

Deceased Child

3.11 Date of death: [ ] day [ ] month [ ] year

3.12 How many children were born before the deceased child? [ ]

3.13 Interval with the child born afterwards [ ] months

3.14 Place of delivery 1 Hospital [ ] 2 Residence [ ] 3 Other [ ]

3.15 Does the child have a Child Health Card? 1 YES [ ] 2 NO [ ]

3.16 Complete vaccinations for his/her age? 1 YES [ ] 2 NO [ ]

3.17 Is weight and height recorded?

3.17.1 Weight 1 YES [ ] 2 NO [ ]

3.17.2 Height 1 YES [ ] 2 NO [ ]

Date	Age		Weight	Height
	Years	Months		

3 17.3	Malnourished? According to the weight/height record	1 YES [ ]	2 NO [ ]
3.18	Exclusive breast-feeding: [ ] months		
3.19	Weaning age (write 99 if still breast-feeding): [ ] months		
3.21	Previous diseases during the last 3 months:		
	1 ADD [ ]		
	2 ARI [ ]		
	3 OTHER: [ ]		
3.21	Three months before the disease, did the child get measles?	1 YES [ ]	2 NO [ ]
3.22	Previous hospitalization?	1 YES [ ]	2 NO [ ]
3.23	Cause of last hospitalization: _____		
3.24	According to the mother, was the child malnourished?	1 YES [ ]	2 NO [ ]
3 25	Did the child belong to any association or institution?	1 YES [ ]	2 NO [ ]
	Which one? _____		

4. PROGRESS OF THE DISEASE

Name of the child _____

Day _____

Starting date of disease [ ] day [ ] month [ ] year

4.1 Signs and symptoms

1 _____

2 _____

3 _____

4 _____

4.2 Why do you think the child became ill?

_____

_____

_____

_____

4.3 Did the child stay the same, get worse, or get better?*

THE SAME [ ] WORSE [ ] BETTER [ ]

*4.4** *Why do you think the child stayed the same, got worse, or got better?*

_____

_____

_____

4.5 Did you think the disease was serious? 1 YES [ ] 2 NO [ ]

4.6 Why?

_____

_____

_____

4.7 What did you do? (at home)

_____

_____

_____

4.8 Why?

_____

_____

_____

4.9 How did you do it?

_____

_____

_____

4.10 Where did you seek help?

TRADITIONAL HEALER	[ ]
HOSPITAL	[ ]
HEALTH CENTER OR HEALTH POST	[ ]
COMMUNITY HEALTH WORKER	[ ]
PRIVATE PHYSICIAN	[ ]
PHARMACY, STORE, MARKET	[ ]
OTHER PROVIDER	[ ]
RELATIVE	[ ]
DID NOT SEEK ASSISTANCE	[ ]

4.11 Why did you seek assistance there?

4.12 What were you told the child had?

4.13 What course of action did they recommend?

Recommendation	Fulfilled	Why not

4.14 Was the child hospitalized?

YES [ ] WHY? _____
NO [ ] (Skip to question 17)

4.15 Where was the child hospitalized?

4.16 Were you satisfied with the care received?

4.17 Who cared for the child the most? Note [ ] Hours

1 Mother [ ] 2 Father [ ] 3 Sibling [ ]
4 Grandparent [ ] 5 Uncle/Aunt [ ] 6 Other [ ] _____

4.18 Why do you think the child died?

_____

_____

_____

4.19 Observations

_____

_____

_____

5. RESEARCH WITH THE HEALTH SERVICES

Child's record number [ ]

Name of the child _____

Name of the interviewer _____

5.1 Type of health facility

1 Health Center [ ]
2 Hospital [ ]
3 Private [ ]
4 Other (Specify) [ ] _____

Name and address of the health facility

_____

5.2 Type of personnel who attended the child

1 Physician [ ]
2 Nurse [ ]
3 Nursing Auxiliary [ ]

5.3 Source of information

1 Record book [ ]
2 Clinical history [ ]
3 Other registry [ ] _____

5.4 Reason for consultation

1 Diarrhea [ ]
2 Respiratory infections [ ]
3 Other [ ]
9 Not recorded [ ]

5.5 Signs found during physical examination

1 _____

2 _____

3 _____

4 _____

Not recorded [ ]

5.6 Diagnosis

_____

_____

_____

Not noted [ ]

5.7 Treatment (including symptomatic treatments, referral, dose and duration of prescribed drugs)

_____

_____

_____

Not noted [ ]

5.8 Length of hospitalization [ ] days [ ] hours

5.9 Observations

_____

_____

_____

_____

_____

_____

_____

_____

_____

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525 Twenty-third Street, N.W.
Washington, D.C. 20037, U.S.A.
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