

directing council



PAN AMERICAN
HEALTH
ORGANIZATION

regional committee

WORLD
HEALTH
ORGANIZATION



XXX Meeting

Washington, D.C.
September-October 1984

XXXVI Meeting

INDEXED

Provisional Agenda Item 27

CD30/17 (Eng.)
26 July 1984
ORIGINAL: SPANISH

INTERNATIONAL PROGRAM ON CHEMICAL SAFETY

The document on the International Program on Chemical Safety (IPCS) (Document CE92/19) (Annex I) was presented to the Executive Committee in response to Resolution EB73.10 of the Executive Board of WHO.

It reviews the inception and purposes of the IPCS, the resolutions adopted in connection with chemical safety in the Region, regional problems and trends, and the activities and resources in the Region. It offers suggestions on policies, strategies and activities, and on possible areas on which the regional program could concentrate in its future development.

The Executive Committee approved a resolution on this topic (Annex II) recommending to the Directing Council that it approve the document, to the Governments that they support the policies and strategies proposed, and to the Director that he develop the measures suggested in the document, including the preparation of a status evaluation report on chemical safety in the Region and the development of a medium-term program (1984-1989).

Annexes



*executive committee of
the directing council*

PAN AMERICAN
HEALTH
ORGANIZATION

*working party of
the regional committee*

WORLD
HEALTH
ORGANIZATION



92nd Meeting
Washington, D.C.
June 1984

CD30/17 (Eng.)
ANNEX I

Provisional Agenda Item 18

CE92/19 (Eng.)
2 May 1984
ORIGINAL: ENGLISH

INTERNATIONAL PROGRAM ON CHEMICAL SAFETY

This document on the International Program on Chemical Safety (IPCS) is being submitted to the Executive Committee in response to the Resolution EB73.10 of the Executive Board of WHO.

After considering the origins and objectives of IPCS, the resolutions related to chemical safety at the regional level, the regional problems and trends, and the activities and resources in the Region, the Executive Committee may wish to provide further guidance to the Director in this area.

Aiming at the future development of IPCS in the Region, the document provides suggested policies, strategies and activities, as well as possible areas of concentration for the regional program.

TABLE OF CONTENTS

	<u>Page</u>
1. BACKGROUND	1
1.1 Origins and Objectives of the IPCS; Structure and Evolution of the Program	1
1.2 Resolutions Related to Chemical Safety at Regional Level (PAHO)	2
2. SITUATION ANALYSIS OF CHEMICAL SAFETY ACTIVITIES IN THE REGION	3
2.1 Involvement of Country Members	3
2.2 Participation in IPCS Courses and Training Activities	4
2.3 Environmental Health Criteria	5
2.4 Fact-Finding Missions	5
2.5 Chemical Emergency Preparedness	5
2.6 Other Regional Activities related to Chemical Safety in PAHO (not labeled IPCS)	5
2.6.1 ECO/HPE	5
2.6.2 HPE	6
2.6.3 HPV	7
3. RESOURCES AVAILABLE	8
3.1 Central Unit	8
3.2 IPCS/IRRU	8
3.3 IPCS/EURO	9
3.4 PAHO/HQ	9
3.5 ECO/HPE	9
4. REGIONAL PROBLEMS AND TRENDS	9
4.1 Environmental Pollution Caused by Chemicals	10
4.1.1 Air Pollution	10
4.1.2 Water Pollution	11
4.1.3 Food Contamination	11
4.1.4 Soil Pollution	12
4.1.5 Chemicals in the Home Environment	12
4.1.6 Occupational Exposure to Chemicals	13
4.1.7 Chemical Accidents	14

TABLE OF CONTENTS (cont.)

	<u>Page</u>
4.2 Main Operational Problems for the Development of Chemical Safety Programs in the Region	14
4.2.1 Complexity of Public Health Problems	14
4.2.2 Knowledge of the Magnitude of the Problem	14
4.2.3 Lack of Coordination	14
4.2.4 Information and Awareness	15
4.2.5 Manpower Strategies	15
5. FUTURE DEVELOPMENT OF THE IPCS IN THE REGION	15
5.1 Suggested Policies	15
5.2 Suggested Strategies	17
5.3 Possible Areas of Concentration for the Regional Program	18
5.3.1 Manpower Development in the Field of Chemical Safety	18
5.3.2 Risk Evaluation of Priority Chemicals	18
5.3.3 Management of Chemical Emergencies	19
5.3.4 Development of Methodology for Health Risk Assessment	19

1. BACKGROUND

1.1 Origins and Objectives of the International Program on Chemical Safety (IPCS); Structure and Evolution of the Program

The International Program on Chemical Safety is a response to the challenge posed by the widespread use and disposal of old and new types of chemicals throughout the world to the health of present and future generations. Chemicals are essential to sustain man's life and his activities as well as to enhance development. While the safety of chemicals is often seen as a concern predominantly of the industrial countries, their use is worldwide and involves an export trade of thousands of millions of dollars. Therefore, chemical safety is of importance to all Member Countries. The prevention of adverse effects of chemicals is essential for health and to sustain a sound environment.

The United Nations Conference on the Human Environment, held in Stockholm in 1972, recommended that programs be undertaken for early warning and prevention of the deleterious effects of the various environmental agents, acting singly or in combination, to which man is increasingly exposed. It also recommended the assessment of their potential risk to human health, with particular regard to the risk of mutagenicity, teratogenicity, and carcinogenicity.

At the Thirtieth World Health Assembly (1977) Member States considered that the growing use of chemicals in public health, industry, agriculture, food production, in the home--together with environmental pollution resulting from rapid industrialization and new technologies --would need recognition in the health policies and strategies of all countries. The Thirtieth World Health Assembly, in Resolution WHA30.47, requested the Director-General to study long-term strategies for the evaluation of the effects on health of chemicals in the environment, including possible options for international cooperation.

The Thirty-first World Health Assembly (1978), after considering the report of the Director-General of WHO, passed Resolution WHA31.28 endorsing the proposal to implement the Program through a central WHO unit at headquarters for planning and coordination, and a network of institutions that would be assigned specific tasks. The principle of using the capacity of national institutions was the basis for the IPCS, and has since been pursued.

The principal objectives of the IPCS are: (a) to carry out and disseminate evaluations of the risk to human health from exposure to chemicals, based on existing information and data; (b) to encourage the use and improvement, and in some cases the validation, of methods for laboratory testing and epidemiological studies that are suitable for health risk evaluations and propose appropriate methods for assessing

health risks, hazards, benefits and exposure; (c) to promote effective international cooperation with respect to emergencies and accidents involving chemicals; and (d) to promote training of the manpower needed for testing and evaluating the health effects of chemicals and for the regulatory and other control of chemical hazards. Other objectives include the coordination of laboratory testing and of epidemiological studies where an international approach is appropriate and promotion of research to improve the scientific basis for health risk assessment and control of chemical hazards.

The Executive Board of WHO at its 73rd Session in January 1984 passed Resolution EB73.10 encouraging the active participation of developing countries in IPCS and giving particular attention to defining short and long-term priorities on the basis of the needs of all Member States and to the measures for cooperation with Member States in implementing the Program; ensuring close coordination within the Program and with other related WHO programs at national, regional and global levels; and encouraging the increasingly active involvement in the Program of all the WHO regional offices with a view to strengthening the technical cooperation with Member States with respect to chemical safety.

1.2 Resolutions Related to Chemical Safety at Regional Level (AMRO/PAHO)

In October 1970 the XVIII Pan American Sanitary Conference reviewed the man-environment relationships in the light of the resolutions of the Twenty-third World Health Assembly and resolved that PAHO should institute and expand systems for monitoring environmental pollution. In 1972 the XX Meeting of the PAHO Directing Council considered the need to predict the physiological, toxicological, epidemiological and sociological effects of rapid environmental changes and resolved to strengthen knowledge, diagnosis and evaluation of the impacts of the environment on health. PAHO, under the Program of Environmental Pollution Control, undertook pertinent activities and assisted several Member Countries to establish comprehensive environmental pollution prevention and control programs and to develop institutions to manage them.

The 72nd Meeting of the Executive Committee of PAHO (1974) requested the Director of PASB to establish the Pan American Center for Human Ecology and Health (ECO) to collaborate with Member Countries of the Region in preventing or ameliorating adverse impacts on health that may result from environmental intervention and changes, including those related to industrial development. In response to this mandate, PAHO and the Government of Mexico agreed to establish the Center in that country. (Functionally ECO is part of the Environmental Health Program, HPE, of PAHO.)

In 1981, the XXVIII Meeting of the Directing Council of PAHO adopted the Plan of Action to Implement the Regional Strategies of Health for All by the Year 2000. One of its sections emphasizes the need to control physical and chemical pollution, placing special attention on the formation of intersectoral relations with national development units and industrial and agricultural sectors. The Plan of Action highlights the following:

"(a) Development of policies and legislation for prevention and control. Analysis and dissemination of information on physical and chemical pollutants including data on morbidity and mortality. Designation of national focal points to participate in the International Program for Chemical Safety. (b) Detection, treatment and prevention of hazards from intoxicants. Establishment of coordination mechanisms with users of physical and chemical agents for prevention, treatment and control. Incorporation of environmental, ecological and biological monitoring in prevention and control programs. Education of health service workers and the population regarding newly introduced toxic chemicals. (c) Implementation of policies and plans for prevention and control. Establishment of information systems for management and decision-making. Preparation of guidelines for the establishment of environmental and biological monitoring in prevention and control programs. Promotion of support from manufacturers and users of physical and chemical substances. Development of guidelines and implementation of emergency response mechanisms. Promotion of education and training programs for professionals and technical staff as well as education of the public."

In 1983 the XXIX Meeting of the Directing Council of PAHO approved Resolution XXVIII, requesting the Director to "consolidate ECO as a center capable of meeting the needs presented by the Organization's Member Countries, and that ECO's technical program be focused on the epidemiological and toxicological aspects of the effects on health of the principal chemical pollutants of industrial and agricultural origin."

2. SITUATION ANALYSIS OF CHEMICAL SAFETY ACTIVITIES IN THE REGION

2.1 Involvement of Member Countries

In Canada and the United States of America, scientific programs exist in academic, government and industrial sectors which address all of the IPCS objectives. Both countries are an excellent source of highly qualified human resources in all fields of toxicology, chemistry, epidemiology, medicine, etc. These countries are firmly committed to the goals and objectives of IPCS and the governments provide major financial contributions to the Program. Participating institutions (IPCS/PI) in both countries are located within various government agencies.

The IPCS/PI for Canada is the Health Protection Branch (HPB) within the Federal Department of National Health and Welfare. The Branch contains the major units within the Federal Government which generate and utilize scientific data for the regulation of chemicals with regard to human health.

IPCS/PI within the United States are located in the National Institute of Environmental Health Sciences (NIEHS); Environmental Protection Agency (EPA); Food and Drug Administration (FDA); and the National Institute for Occupational Safety and Health (NIOSH). The programs related to chemical safety within anyone of these agencies are extremely broad and may encompass all of the objectives within IPCS.

In chemical safety programs within Canada and the United States, the major emphasis is in the areas of methodological development as well as research and evaluation of risks to man and the environment from chemical exposures. Problems related to pesticide and industrial chemicals in food, water, consumer products and the workplace are of paramount importance. Such projects as environmental monitoring, food contaminant levels and environmental epidemiology provide valuable data for use in IPCS-related activities within the Environmental Health Division of WHO/Geneva, as well as Vector Biology and Occupational Health.

Besides Canada and the United States of America, other countries of the Region have developed as well a number of national institutions that may contribute to the further strengthening of the IPCS in the Americas. As an example of this institutional development, Brazil has several governmental resources such as Secretaria Especial do Meio Ambiente (SEMA), Companhia de Tecnologia de Saneamento Basico del Estado de Sao Paulo (CETESB), Universidade de Sao Paulo, Universidade de Campinas, Instituto Adolfo Lutz, and Fundacao Estadual de Engenharia do Meio Ambiente (FEEMA) of the State of Rio de Janeiro.

Mexico has institutions such as Instituto Nacional de Investigación en Recursos Bióticos, Instituto Politécnico Nacional, Instituto Tecnológico de Monterrey, Universidad Agrícola Autónoma de Chapingo, Universidad Nacional Autónoma de México, Instituto Mexicano de Seguro Social, Sanidad Vegetal, Secretaría de Salubridad y Asistencia, among others.

In Argentina, a number of institutions could be mentioned: Instituto Nacional de Tecnología Industrial (INTI), Instituto de Medicamentos, Facultad de Farmacia y Bioquímica, Universidad de Buenos Aires.

2.2 Participation in IPCS Courses or Training Activities

In a few countries of the Region, a number of courses and training activities were carried out on related subjects such as Food Toxicology

(Brazil, 1983), Manpower Development and Training in Toxicology and Chemical Safety (Mexico and Brazil, 1982, 1983), as a joint national effort with the IPCS and the Pan American Center for Human Ecology and Health (ECO) of PAHO.

Technical officers of various countries of the Region, in particular from the English-speaking Caribbean, have attended the IPCS-sponsored training course on Environmental Impact Assessment in Aberdeen, U.K. (1982 and 1983). ECO participated in the International Workshop on Manpower Development and Training in Toxicology and Chemical Safety (IPCS/CEC/WHO/EURO) held in Luxemburg in 1983.

2.3 Environmental Health Criteria Documents

These documents on priority chemicals, prepared with the participation of experts from all regions and in collaboration with IARC and the International Register of Potentially Toxic Chemicals (IRPTC), review current knowledge and evaluate the risk to human health and the environment associated with exposure to chemicals or groups of chemicals selected from internationally agreed priority lists. There are 33 criteria documents published in English; 15 have been translated into Spanish and disseminated by PAHO to the Member Countries. Executive summaries of 16 documents have also been published.

2.4 Fact-finding Missions

During 1982 and 1983, two fact-finding missions were undertaken by the Central Unit of IPCS and IPCS/EURO. Although both missions visited only Brazil and Mexico, they acknowledged the potential of the countries visited as an important resource for the IPCS in the Region. Both missions established contact with ECO.

2.5 Chemical Emergency Preparedness

A workshop on chemical emergency preparedness is scheduled to be held in ECO, 23-27 July 1984, with the participation of various countries of the Region. The main objective is to create awareness of the problem of chemical accidents, especially during transport. The IPCS/EURO will contribute by providing a consultant who will participate in the development of a basic follow-up protocol to investigate the health implication after the accident.

2.6 Other Regional Activities Related to Chemical Safety in PAHO (not labeled as IPCS)

2.6.1 ECO/HPE

PAHO has been active in projects related to the field of chemical safety through various programs. Most of the activities were carried out

by ECO/HPE, and were concerned mainly with manpower development, including publication of training materials specifically on safe use of pesticides, epidemiological methods for environmental risk assessment, basic toxicology and the adaptation to regional needs of many of the WHO documents pertaining to the public health problem associated with the use of potential toxic substances.

In addition, the Pan American Center for Sanitary Engineering and Environment Science (CEPIS) of PAHO/HPE serves as the regional focal point for the Global Environmental Monitoring System (GEMS) for water programs; 23 countries are participating with 105 laboratories in the regional network.

2.6.2 Workers Health Program (HPW)

The number of toxic chemicals produced and handled by workers is rapidly increasing. There is special need for action to protect workers who are exposed to toxic chemicals which might endanger their health or even survival. However, the scanty statistical data available grossly underestimate the magnitude of the problem. Even diseases such as pneumoconiosis and acute chemical intoxications are usually under-reported. The full impact of work in the etiology of cancer, chronic cardiovascular disease and neurological disease has not been measured. Information is least complete for workers in agriculture, construction, transport and the smaller factories where there is reason to believe that the risks are greater.

The contribution of PAHO to reduce or control the health effects of occupational exposure to chemicals is based on the undertaking of occupational health programs with adequate coverage and content, to permit reliable identification, with adequate measurement, and control of the work-related factors and conditions responsible for adverse effects on health.

Accordingly, PAHO's activities to prevent or control health effects of occupational exposure to chemicals are aimed at:

- Collection, collation and integration of available statistics from the countries relating to occupational accidents (including acute intoxications of occupational origin), occupational diseases and work-related diseases with attention to differences in the various reporting systems.
- Epidemiological studies including the use of small, directed surveys to develop information on the incidence and prevalence of occupational accidents and diseases and work-related conditions.

- Facilitation of the selective dissemination of the information produced by bibliographic systems, warning systems, and by registers of potentially toxic or dangerous industrial products, methods, and processes.
- Scientific support for the development of legislation and regulation of control of occupational risks.
- Development of special programs for vulnerable workers (women, minors, migrants, etc.) and for workers in high-risk industries.
- Promotion of the orientation of all health workers to workers' health issues.
- Promotion of training of primary care providers in the management and prevention and in the recognition of occupational health hazards and health effects.

2.6.3 Veterinary Public Health (HPV)

Although HPV has had no direct IPCS activity, there are several functions related to the objectives of the IPCS which are of human and animal health significance.

The principal concern of the HPV presently is the increasing level of contamination by synthetic chemicals in the food supply. These chemicals enter intentionally and unintentionally. Greater emphasis by the Member Countries on increasing agricultural productivity to satisfy governments' desire for amplified agricultural product exportation for economic reasons and to meet enlarging domestic demand for more and better food has led to the importation and application of large quantities of synthetic chemicals but inadequate control or surveillance. Many of these chemicals are prohibited or restricted in use in the exporting countries for toxicological reasons associated with hazards to human and animal health. They are entering the food supply at an unprecedented rate with practically no control or monitoring.

Direct contamination of the food supply is of major concern, but equally significant is the passage of the chemicals through animals destined for human consumption. These chemicals may accumulate greater concentrations in animal tissue than in plants, and in addition there may be production of biochemical metabolites from metabolism of the chemicals. Toxicity of these metabolites has yet to be determined.

Through the Food Protection Sub-Program (HPV/FP) of HPV, efforts are being made to strengthen countries' capability in the analysis of food for residues and the prevention of contamination. These residues may be synthetic chemicals, hormones, biologics, pharmaceuticals, and heavy metals. Collaboration for many years has been carried out with the

Joint FAO/WHO Food Contamination Monitoring Program (FCM) of which there are five collaborating centers in the Americas: Brazil, Canada, Guatemala, Mexico, and the United States of America. The Organization continues to support these centers through technical consultation, training and the provision of laboratory supplies and equipment. A sizeable portion of the information already compiled by the FCM has been supplied by these five laboratories of the Americas.

Another activity of HPV/FP related to chemical contamination of food is a recent investigation of the production, distribution, and application of veterinary pharmaceuticals to animals destined for human consumption and the detection of subsequent residues. The report is being prepared.

A main program element of HPV is the veterinary medical contributions to environmental quality. Two components of this element are pesticides use and animal waste disposal. Preliminary consultations are being conducted with several authorities of the livestock producing countries to establish criteria, standards and monitoring procedures for these two major problems.

Collaboration continues between HPV and the Program on Workers Health and ECO in matters related to the IPCS.

3. RESOURCES AVAILABLE

3.1 Central Unit (CU), WHO Headquarters

The operational instrument of IPCS is the Central Unit established at WHO headquarters and is responsible for the overall management and coherence of the Program. The unit at headquarters currently comprises 17 staff: 8 professionals and 9 general service staff.

3.2 IPCS/Inter-Regional Unit (IRRU)

In addition to the Collaborating Center for Environmental Health located within NIEHS, WHO, as part of IPCS, has established an IRRU to assist the Central Unit in the relationships with the participating institutions in the Region, mainly in the United States of America. It is situated at NIEHS and is staffed by two professionals and two support staff.

All tasks of the IRRU are carried out on behalf of the Central Unit. These are: (a) working with the United States institutions at Research Triangle Park and elsewhere to plan and assume responsibility for implementation of designated projects and activities of IPCS, with particular emphasis on mutagenicity and specific organ toxicity and to assist in the preparation of environmental health hazard assessments; (b) to maintain liaison with CU, IPCS, Geneva and national PI's (emphasis

on AMRO) and assist in coordinating, monitoring and evaluating their work; (c) to maintain liaison with the WHO Regional Office for the Americas, and as requested assist in furthering the goals of IPCS within AMRO; (d) other scientific and administrative tasks assigned by the Manager, CU, IPCS (e.g. organize expert committees, study groups, training courses, scientific consultations).

3.3 IPCS/EURO

The EURO Office, on behalf of IPCS, has assumed the responsibility for the implementation of some of the activities in the area of manpower development and the management of chemical emergencies.

3.4 PAHO/HQ

HPE, HPW and HPV devote part of their assigned budget to the development of various types of activities related with chemical safety. Also some IPCS related activities fall within the Program of Tropical Diseases (HPT).

3.5 ECO/HPE

The Pan American Center for Human Ecology and Health is located in Metepec, Mexico. The Center is staffed with 7 professionals and 14 technical and support staff. ECO has been active in promoting and assisting member countries in the development of national programs in the area of environmental epidemiology and toxicology as means to identify, prevent and control health problems related to industrial and agrochemical toxic substances. ECO is the PAHO focal point for organizing a Regional Information System on Health Effects of Toxic Substances which will be integrated to the Pan American Network for information in Sanitary Engineering Sciences operated by CEPIS/HPE/PAHO.

4. REGIONAL PROBLEMS AND TRENDS

The pattern of socioeconomic development adopted by most countries of this Region is based on the binomium industrialization-urbanization. In spite of the positive achievements, such process, when accelerated and not well planned, becomes a heavy burden on public health.

The size of the manufacturing sector in Latin America has quadrupled from US\$37 billion per year in 1960 to US\$133 billion in 1980. In contrast, the value added by mining and agriculture, previously the most important sectors of this Region's economy, less than doubled during the same 20-year period and now together contribute only half of the manufacturing sector to the gross domestic product of Latin America and Caribbean. As manufacturing has expanded, so has the number of individual workers employed in it. The Latin America labor force is one

of the fastest growing in the world, doubling every 25 years. In 1960 there were 67 million people in the Region's work force. In 1980 there were 112 million, and by the end of the century there will be almost 200 million workers.

In 1970, 57.2% of the urban population of Latin America was living in 165 cities with 100,000 inhabitants or more. Of these cities, 17 had more than a million inhabitants, and the population of four exceed five million. In 1980 the proportion of the urban population living in cities with 100,000 or more inhabitants rose to 63.5%, that is 147.6 million people living in 230 cities, of which 25 passed the million inhabitants mark and five have more than five million inhabitants. The magnitude of the problem inherent in such concentration of population is extremely difficult to envisage but suggests certain courses of future action for the health sector.

In this scenario, the protection of human health and the environment against the adverse effects of the vast quantity of chemicals that may occur in the home, at work, in food, and in air, water or soil pollutants is one of the most complex and challenging problems to be dealt with by the governments. Some of these problems will be mentioned as examples and trends in our Region.

4.1 Environmental Pollution Caused by Chemicals

4.1.1 Generally in the past the air pollution problem in this Region was monitored through the Pan American Air Sampling Network, established in about 40 cities in Latin America and Caribbean. The network was operated by PAHO's Center for Sanitary Engineering and Environmental Sciences (CEPIS) until 1980. The periodic reports indicated an upward trend in the levels of settled dust, suspended dust and sulfur dioxide. For some stations excessively high concentrations were recorded. National and local networks confirmed this trend in several countries and cities.

No country has established surveillance systems to assess the effects of air pollution on health. Nevertheless, some studies carried out in industrialized areas of Latin America have found associations between: (a) acute pollution exposure and morbidity and mortality; (b) chronic lower-level exposure and morbidity; (c) exposure and impairment of function and performance; (d) exposure and symptoms of sensory irritation; and (e) exposure and other effects on well-being.

For instance, at least in one acute air pollution episode that occurred in Sao Paulo, Brazil, a close relationship was found between excess mortality and atmospheric concentrations of sulphur dioxide. Respiratory illnesses (chronic bronchitis, especially) were the largest single contributor to the rise in death rate. Other analyses have shown increases in the frequency of emergency room visits during or shortly after acute pollution episodes.

Aggravation and/or causation of chronic bronchitis, asthma and pulmonary emphysema have been considered in association with chronic exposure to polluted air. Several recent studies carried out in industrialized countries of Latin America have shown that both overall morbidity and mortality from respiratory diseases are higher in areas of high atmospheric pollution than in otherwise similar areas of low atmospheric pollution. It was also demonstrated in one country of Latin America that impairment of lung function in schoolchildren is more frequent in children living in polluted areas than in areas where the atmospheric pollution is not so high.

The epidemiological evidence as to the effects of air pollution on man, refers to the common urban air pollutants, such as sulphur dioxide and suspended particulate matter and, to some extent, carbon monoxide and oxidants. A large number of other chemical pollutants are found in urban air, particularly in the vicinity of specific industries, and are known to be harmful to health. Indeed, in some Latin America and Caribbean countries, several clinical and epidemiological studies have described health effects on the community caused by air pollutants such as lead, mercury, cadmium, arsenic, manganese, hydrogen sulfide and mercaptans, fluorides, chlorine and hydrogen chloride, asbestos and organochlorine pesticides. In one heavily polluted area of Brazil an unnoticed increase of congenital malformations is now appearing and may be related.

4.1.2 Water pollution is most often caused by the uncontrolled disposal of domestic sewage and industrial wastes containing a variety of pollutants. The deliberate spreading of agro-chemicals to increase crop yields is another cause of water pollution. A complete listing of the substances present in industrial waste waters would run into the thousands. These include detergents, solvents, cyanides, heavy metals, mineral and organic acids, nitrogenous substances, fats, salts, dyes and pigments, phenolic compounds, tanning agents, sulfides, ammonia, etc.

If present above a certain level, some chemical pollutants may constitute a direct toxic hazard when ingested in water or through other types of contact. Some studies carried out in Latin America have confirmed that consumption of water with a high nitrate concentration may result in infant methemoglobinaemia. High concentrations of arsenic have been reported in some drinking water supplies in some regions of Argentina, Chile and Mexico. Arsenic has been frequently and increasingly found accumulated in marine organisms, such as clams and shrimps.

4.1.3 Food contamination. In recent years, there has been increasing concern in Latin America and the Caribbean over the presence of mercury in food. High levels have been found in fish caught in polluted bays and estuaries, because fish appear to concentrate mercury from water, several thousandfold. Mercury is most frequently encountered in fish as methylmercury, which is the most dangerous form, responsible for the well

known "Minamata disease." An epidemic in Japan was responsible for deaths and many cases of irreversible brain damage. This potential risk has been reported in several countries, including Argentina, Brazil, Colombia, Mexico, Nicaragua, and Venezuela, among others. Cadmium concentration in marine animals has also been reported.

Other chemical contaminants of food mentioned in several reports of this Region include N-nitroso compounds (Chile, for example), polychlorinated biphenyls (PCBs), pesticides and food additives. Among pesticides, the organochlorine insecticides are of major importance because of their stability and persistence in the environment. Several serious accidents of poisoning by Aldrin and Endrin have occurred in many countries of this Region, with several deaths. The presence of DDT in mother's milk has given rise to particular concern, especially in view of the low levels of detoxifying enzymes present in the infant. One study carried out in one country has demonstrated that daily child breast-feeding consumes between 7 and 244 times the maximum daily DDT intake legally permitted in the United States of America and advocated by WHO and FAO. The organochlorine pesticide residue found in adipose tissue is also far greater than pesticide residue present in people from European countries.

4.1.4 Soil pollution is usually associated with the use of chemicals, such as fertilizers and growth-regulating agents, in agriculture; the dumping on land of large masses of waste materials from the mining of coal and minerals and the smelting of metals; and the dumping on land of domestic refuse and solids resulting from the treatment of sewage and industrial wastes. Problems like these are increasing in this Region, and several serious problems have been reported recently.

4.1.5 Chemicals in the home environment. In addition to the conventional causes of accidental injuries at home, modern technology has introduced a variety of consumer products that present chemical hazards. The proliferation of consumer chemicals makes the task of protecting the population from such hazards increasingly difficult. The poison control centers in some countries have listed more than 40,000 different toxic agents that may be used in the home.

The magnitude of the problem can be illustrated by the data from the United States of America. The total annual number of injuries from toxic products was recently estimated to be about 1,600,000, with 3,000 fatal cases. This estimate includes 25,000 injuries from toxic hazards of recreational equipment, 139,000 from flammable liquids (other than burns) 540,000 from laundering and cleaning products, and 75,000 from pesticides. Ingestions of potentially harmful substances ranged from 500,000 to 1,000,000 incidents, resulting in more than 2,000 deaths, 350 of which were in children under five years of age. Poisoning is the second or third most important external cause of fatal domestic accidents in some countries. Available statistics reflect the activities of poison centers rather than the actual situation in a community. Although a

meaningful comparison of accidental poisoning statistics for different countries is not possible, there is no doubt that drugs used internally or externally as cosmetics, cleaning agents, paints, solvents, and pesticides, are high among the leading causes of intoxication.

4.1.6 Occupational exposure to chemicals. In numerous occupational activities workers must handle potentially toxic chemicals. Many industrial processes involve chemical reactions in which substances toxic or hazardous to man are liberated. Exposure to chemicals in work places may cause subclinical or clinical impairment of health in a direct exposure-response relationship. However, it also may affect indirectly the incidence of, for example, chronic degenerative diseases "caused" by a variety of endogenous and exogenous factors.

It has been demonstrated that occupational exposures to toxic agents make a substantial contribution to chronic disease prevalence in the developed countries. Researchers have estimated that 400,000 workers become ill and 100,000 workers die each year in the United States of America as a result of work-related diseases. There is currently a debate on the percentage of cancer mortality attributable to occupational exposures in the United States, with epidemiologists' estimates ranging from 4% to 20% or more.

To date there have been no comprehensive attempts to measure the impact of workplace exposures to chemicals of morbidity and mortality rates in Latin American and Caribbean countries. Nevertheless, the abundant scientific literature concerning the effects of occupational exposures in this Region is more than enough to state that occupational disease is also a large and growing problem in Latin America and Caribbean. If the annual rate of incidence of occupational diseases found in developed countries (30-40 cases/10,000 workers) can be extrapolated to Latin America and the Caribbean, more than 300,000 cases of occupational diseases could be expected annually. No more than 5% of this expected occurrence is currently reported.

In addition, this Region is heavily committed to agroindustrial production. In most countries of the Region, a large proportion of the working force is engaged in the various elements of the agricultural sector, both in primary production, processing and distribution of food and in the production, transport and application of agrochemicals, including pesticides. Since 1972, world pesticide consumption as an average increased 5% per year. Some countries in Latin America have experienced an even sharper increase.

Much of the rural population of Latin America receives little or no training in the safe handling of these dangerous substances. Consequently, the incidence of pesticide poisoning among agricultural workers is extremely high. During the years 1971-1976, 17,183 cases of pesticide intoxication were reported in El Salvador and Guatemala alone.

4.1.7 Chemical accidents. In several countries of the Region, chemical emergencies have occurred, with serious repercussions on the health of the community, as well as adverse effects on the environment. The more important types of chemical accidents reported were:

- Accidents in transport and in storage facilities handling large quantities of chemicals;
- Misuse of chemicals, resulting in contamination of foodstuffs, overdosing of agrochemicals, etc;
- Disaster/explosion in a plant handling or producing potentially toxic substances;
- Improper waste management, such as uncontrolled dumping of toxic chemicals, failure in waste management systems or accidents in wastewater treatment plants.

4.2 Main Operational Problems for the Development of Chemical Safety Programs in the Region

The impact of chemicals on human health in Latin America and the Caribbean were relatively unnoticed up to the beginning of the 1960's, except for a few localized problems. However, with rapid industrial development, population growth, urbanization, and the mechanization of agriculture, the concern of the health authorities was aroused and some steps were taken.

In summary, the main operational problems for the majority of the countries of the Region are:

4.2.1 Complexity of public health problems. Most countries of the Region are still trying to overcome health problems that are a legacy of underdevelopment, such as malnutrition, diarrheal diseases, parasitic diseases, etc. Simultaneously, as a result of socioeconomic development, they have to deal with the added burden of morbidity and mortality, such as tumors, cardiovascular diseases, respiratory diseases, accidents, among others. In the etiology and/or triggering of various of these problems, chemicals may play an important role.

4.2.2 Knowledge of the magnitude of the problem. The increasing complexity of sources of exposure to chemicals has not permitted a comprehensive view of the real dimension of the problem in the Region. There is a lack of knowledge of the epidemiological characteristics of the impact of chemicals on human health in most countries. This is one of the crucial gaps that starts and feeds a vicious circle of improper characterization of the problem, that causes improper definition of programs, poor budgeting and incapacity to overcome the problem.

4.2.3 Lack of coordination. The relative weakness of programs that deal with chemical safety within ministries of health becomes more critical

when lack of coordination exists with other ministries or agencies engaged in the same field. It is very common in several countries of this Region to see that components of chemical safety programs are scattered in many different sectors and administrative units (Health, Environment, Planning, Interior, Agriculture, Labor, Justice, etc.), with a great deal of dispersion of resources, overlaps and conflicts that could be prevented if a better mechanism of coordination could be achieved.

4.2.4 Information and awareness. In this complex scenario, very frequently there is a scarcity of adequate information and/or a plethora of misinformation. On the one hand, updated scientific and technological information is inaccessible to the public health planners and administrators. While on the other, decision-makers and the community in general are usually exposed to information misinterpreted by the media. Workers are usually not aware of the risks they are exposed to.

4.2.5 Manpower shortage. Safeguarding human health and the environment against deleterious effects of potentially toxic chemicals requires research as well as adequate control mechanisms. These indispensable activities are presently hampered by lack of personnel adequately trained to perform the multitude of tasks involved in the evaluation and control of chemicals. A preliminary survey carried out by ECO-PAHO confirmed this scarcity. The challenge is to train personnel at all levels quickly enough and in adequate numbers. While the "toxicologist" and the environmental epidemiologist provide the core of knowledge that is needed, operations require many people with a knowledge of toxicology in addition to other backgrounds and experience. At present, very few places in developing countries in the Region offer training in toxicology and environmental epidemiology at any level.

5. FUTURE DEVELOPMENT OF IPCS IN THE REGION

5.1 Suggested Policies

As mentioned previously, IPCS-related activities are limited in the Region. On the one hand, two highly developed countries--Canada and the United States of America--are active in the program. National institutions from these countries are playing an important role within the IPCS framework, both in carrying out specific tasks and in supporting the program budget. On the other hand, to date IPCS as such is practically unknown in most of the other countries of the Region, namely in Latin America and the Caribbean. Nevertheless, there are modest activities related to chemical safety carried out or technically supported by PAHO/WHO under different programs (HPE/ECO, HPV, HPW, etc) which have not yet been identified or "labeled" as IPCS activities.

According to the historical development of IPCS as a concept, and taking into account the objectives of the Program, the following policies could guide the course of the desired development in this Region:

- IPCS as a concept and an instrument to promote an integrated and comprehensive understanding and management of chemical safety. IPCS should be understood and promoted in the Region as an instrument to avoid or remove the fragmented approaches to the problem of chemical safety. Such understanding is vital for the development of the program within the PAHO structure ("internal" level), as well as for a policy for further technical cooperation to Member Countries. IPCS should be introduced and promoted inside and outside PAHO as an opportunity to put forward the multidisciplinary approach required to cope with chemical safety issues.
- IPCS as a mechanism for facilitating international cooperation among institutions of different countries. Rather than a "new" or "own" program, since its beginning, IPCS was conceived as a mechanism to facilitate the international cooperation among institutions that deal with chemical safety. Indeed, except for the Central Unit, IPCS means a network of institutions which carry out specific tasks as "participating institutions." This concept is of paramount importance for the development of the Program in the Region, mainly because PAHO is committed to the promotion of intercountry cooperation.
- IPCS as an opportunity to cover present gaps in the technical cooperation of PAHO to the Member Countries. As previously mentioned, the WHO and PAHO Secretariats have received mandates to develop or enhance activities in the field of chemical safety. To date, at least in this Region, these mandates have not yet been fulfilled completely. Accordingly, IPCS should be promoted in this Region with the understanding that this program can represent an opportunity to enhance the technical cooperation to Member Countries, in an attempt to cover gaps and specific areas where PAHO has not yet been very active. The IPCS concept and structure is an excellent opportunity and vehicle for this purpose, particularly as it is designed for mobilization and potentialization of the national capacity. Several agencies and institutions in Member Countries, even not traditionally considered within the "health sector" (in the narrow view), can now be mobilized, engaged, and committed to this international effort through IPCS.
- IPCS as a concept and structure that can be useful at national level. As chemical safety issues are being tackled at the international level by IPCS, aiming at focusing the attention of the chemical safety problems in the countries, the same methodologies and strategies could serve to tailor the national efforts to cope with their problems. Comprehensiveness and integration of the approaches for problem identification and control are the basic ingredients, and cooperative efforts and mobilization of resources constitute the main strategy. These approaches should result in the strengthening of national programs.

5.2 Suggested Strategies

Taking into account the original concept of IPCS, its objectives as well as the policies that should guide the development of the program in this Region (mainly Latin America and the Caribbean), the following strategies and activities are proposed:

- a) Dissemination of information on IPCS. The IPCS concept, objectives and main outcomes should be well known by the countries of the Region. It is of paramount importance that appropriate information reach public health planners, administrators, decision-makers and technical staff from the government institutions or agencies engaged in public health and chemical safety, as well as universities and research institutions. For this task, the participation of PAHO's offices at country level is extremely important.
- b) Development of interest and willingness of the Member Countries to participate. It is suggested that PAHO's basic strategy aiming at the development of IPCS in the Region be directed to promote the interest of the countries to participate in the program. The national commitment to the Program is currently formalized through "memoranda of understanding," but more simple instruments have been welcomed by IPCS. This arrangement would be negotiated by PAHO offices at country level, within the framework of the existing work relations between PAHO and each country.
- c) Identification of "participating institutions." Identification of potential "participating institutions" is a continuous process. PAHO is prepared to carry out this phase, because most potential "participating institutions" are already active in other technical programs. The need of an interdisciplinary approach offers a good opportunity to involve institutions from sectors not traditionally included in the "health sector."
- d) Establishment of a regional network. The accomplishment of IPCS objectives will be measured through quality and effectiveness of a network of "participating institutions," which would operate for the benefit of the countries and the Region. As previously mentioned, this strategy constitutes the basis of IPCS as a concept and structure.
- e) Establishment of a "Regional Advisory Committee." A strategy for the development of IPCS activities in the Region would include the establishment of a mechanism to ensure active participation of the countries in the identification of regional priorities, the definition of policies, and in the programming of activities. The Regional Advisory Committee would establish linkages with the "global" Program Advisory Committee (PAC).

- f) Establishment of an "Inter-Program Coordination Group" within PAHO. To improve "internal" PAHO inter-program coordination, an "Inter-Program Coordination Group" would be created. In principle, such a working group would include representatives from the following programs and units: Environmental Health/ECO, Veterinary Public Health, Tropical Diseases, Workers' Health, Health of Adults, Epidemiology, and Emergency Preparedness. Also the IRRU/IPCS Unit would be invited to participate. The working group would be chaired by the Director of Health Programs Development Area (HPD), and HPE would act as the Secretariat.
- g) Preparation of a status evaluation report on chemical safety in the Region. ECO/HPE should undertake the task of preparing a status report on problems, programs and resources available in the countries to evaluate the situation in the Region and to obtain elements for programming. The procedure should also serve to identify national institutions that might be interested in participating in the Regional IPCS Cooperating Network.
- h) Preparation of a medium-term program of activities, 1984-1989. Based on the status report, and under the guidance of the Regional Advisory Committee, the Medium-Term Program would be prepared. The Medium-Term Program (MTP) would identify regional priorities, the activities to be undertaken and the financial implications, especially those pertaining to PAHO. The medium-term program would have to be compatible with the global IPCS and should reflect the country needs.

5.3 Possible Areas of Concentration for the Regional Program

5.3.1 Manpower development in the field of chemical safety

- a) Training of various categories of personnel, particularly in the field of environmental epidemiology and toxicology;
- b) Technical and financial assistance to support training activities, including fellowships, materials, and equipment;
- c) Development of educational material relating to chemicals control in Spanish and Portuguese; in some cases this will simply require translation and in others the preparation of material appropriate to suit regional needs.

5.3.2 Risk Evaluation of Priority Chemicals

- a) The Region would participate in the evaluation of risks due to exposure to environmental chemicals of global health significance conducted by the global program, as well as in the dissemination of environmental health criteria documents.

- b) Preliminary rapid evaluations of chemicals of health significance would be considered; the information would be disseminated in the form of short health risk evaluation documents.
- c) The Region would participate in the development of guidelines on exposure limits. Acceptable daily intakes (ADIs) for food additives and pesticide residues in food are being established using the mechanism already set up by the Joint FAO/WHO Expert Committee on Food Additives and Joint FAO/WHO Meetings on Pesticide Residues. Provisional tolerable weekly intakes (PTWIs) for cumulative toxic metals, body burdens and corresponding exposure limits in air, food and water will also be established.

5.3.3 Management of Chemical Emergencies

This component will focus on:

- a) Facilitating the access of Member Governments to information related to technological disasters, their health risks, and actions needed to mitigate or counteract associated health problems;
- b) Increasing awareness of the public health implications of technical disasters through seminars, courses, etc;
- c) Stimulating the health sectors of the countries to formulate plans and activities for the control of and response to such occurrences.

5.3.4 Development of Methodology for Health Risk Assessment

The program will continue to promote the development and harmonization of applicable methods for the evaluation of health effects of environmental chemicals in air, food, water and consumer products, and to establish guidelines for risk assessment. Information on the most appropriate methods of evaluation will be disseminated through technical/scientific monographs. Seminars, workshops and courses will be organized to promote the use of appropriate methods of evaluation.



EXECUTIVE COMMITTEE OF
THE DIRECTING COUNCIL

PAN AMERICAN
HEALTH
ORGANIZATION

92nd Meeting

WORKING PARTY OF
THE REGIONAL COMMITTEE

WORLD
HEALTH
ORGANIZATION

92nd Meeting



CD30/17 (Eng.)
ANNEX II

RESOLUTION
V

INTERNATIONAL PROGRAM ON CHEMICAL SAFETY

THE 92nd MEETING OF THE EXECUTIVE COMMITTEE,

Having reviewed the report on the International Program of Chemical Safety (IPCS) (Document CE92/19);

Considering Resolution EB73.10 of the Executive Board of WHO urging countries to participate in IPCS and the increasingly active involvement of all WHO Regional Offices in it;

Being aware of the growing importance of evaluating and dealing with health problems associated with human exposure to the extensive use of chemical substances and products, and of the need to avert the adverse effects of such products and preserve a wholesome environment; and

Recognizing the importance of integrating IPCS into existing environmental and occupational health and safety programs so as to avoid costly duplication of services,

RESOLVES:

1. To take note of the report on the International Program of Chemical Safety (IPCS) presented by the Director and to refer it to the Directing Council with a recommendation that it approve the program proposed for the Americas.
2. To recommend to the Member Countries that they become more involved in the activities of IPCS and support the policies and strategies proposed in the report for determining the action to be taken in the Region.
3. To recommend to the Director that, subject to the availability of resources, he develop the measures suggested in the report, including the preparation of a status evaluation report on chemical safety in the Region and the development of a medium-term program (1984-1989), and to request that he present a report on the results to the June 1985 Meeting of the Executive Committee.

(Approved at the fifth plenary session,
27 June 1984)