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EXPANDED PROGRAM ON IMMUNIZATION IN THE AMERICAS

Progress Report

This progress report is presented to the 84th Meeting of the Executive Committee in response to Resolution XXI of the XXVI Meeting of the Directing Council in September/October 1979.

1. Program Objectives

Regional program policies and strategies were approved in Resolution XXVII of the XXV Meeting of the Directing Council in September 1977, which resolution also endorses the global policies approved by Resolution WHA30.53, adopted by the Thirtieth World Health Assembly in May 1977.

These resolutions reinforce recommendations stated in the Ten-Year Health Plan for the Americas, and recognize that immunization activities are one of the main components of the extension of coverage of health services and the entry point for primary health care.

The Program's long-term objectives are to:

- reduce morbidity and mortality from diphtheria, pertussis, tetanus, measles, poliomyelitis and tuberculosis by providing immunization against these diseases for every child in the world by 1990 (other selected diseases may be included when and where applicable);

- promote countries' self-reliance in the delivery of immunization services within the context of comprehensive health services; and

- promote regional self-reliance in matters of vaccine quality control and vaccine production.

In the medium term, the Program seeks to:

- develop appropriate immunization plans at regional and country levels;

- develop strategies for training national and international staff in the variety of disciplines required for successful program planning and implementation;

- attract the investment of external funds from bilateral and multilateral sources to support program activities at regional and country levels;

- develop country and regional management information systems which assess progress in achieving the Program's objectives accurately and continuously;

- increase the efficiency and effectiveness of the strategies recommended to reduce morbidity and mortality from the target diseases;

- improve the safety, potency, stability, ease of administration and efficiency of production of all vaccines in which the Program has an interest;

- improve and develop the equipment required for program implementation so as to increase its suitability for program purposes, to decrease its cost, and, where applicable, to facilitate its manufacture within countries;

- improve all aspects of program management by applying the knowledge obtained from management information-evaluation systems and from research to promote the use of the most efficient and effective disease control techniques appropriate to each country;

- develop regional strategies to meet Program requirements for vaccine quality control, production and distribution; and

- promote immunization delivery as a component of comprehensive health services provided to the entire population through cooperation with national governments and in collaboration with other PAHO/WHO programs.

Based on the policies approved by the Thirtieth World Health Assembly and the XXV Meeting of the PAHO Directing Council, the above

long- and medium-term objectives dictate the present program strategy of initially developing managerial competence at senior and middle levels to serve as a foundation for solid and enduring program implementation.

2. Progress to Date

Progress up to September 1979 was summarized in previous reports submitted to the PAHO Directing Council (Documents CD25/14 and CD26/10) and the World Health Assembly (Documents A28/WP/5, A29/16 and A30/13).

The Expanded Program on Immunization (EPI) has been subdivided into four major program elements in recognition of the broad approach required to reach the objectives described above. Some of the reasons why immunization programs have not been more generally implemented in developing countries derive from a lack of basic knowledge and a lack of its application. Research is needed to answer both technical and operational questions. These gaps in knowledge, however, are not as important at this point as transferring already available knowledge and skills to national staff through training. As research produces new information and technology, training needs to be modified. At the present time, staff at all levels need training in program management and supervision skills, and this will be a major emphasis during the period 1980-1983. As staff are trained, planning of programs can be improved and actual operations can be expanded. Such expansion will be gradual during this period. The care given to training and planning, however, should result in country programs developing from a sound basis, and more rapid expansion should occur during the following period. Such expansion will also be the result of thorough program evaluation so that the experience of the past can be accurately interpreted and understood. Such evaluations will provide guidelines for future planning, and may also identify new areas requiring additional research.

2.1 Training Activities

A regional EPI workshop in the planning, administration and evaluation of immunization programs was held in Lima, Peru, in January 1979 for participants from all South American countries. This workshop completed the first phase of EPI training activities, which began with the regional EPI workshop held in San José, Costa Rica, in July 1978. These two workshops were directed mainly towards top-level public health officials involved with immunization activities at the national level.

The second phase of training activities, directed towards middle level supervisory personnel who are involved in the day-to-day management of these activities, started in February 1979. In all, six countries held national EPI workshops in 1979, with a total of 363 participants.

The last EPI workshop held in 1979 took place in St. Kitts in December, with the participation of 35 nursing officers from eight Caribbean countries. The text used in the workshop is divided into five modules (EPI diseases, vaccines, the cold chain, programming, and evaluation), which are further divided into units. The text is designed for self-instruction so that each participant can study the material and answer the written problems individually. The participants then meet in small groups to discuss their answers and exchange ideas and experiences. The emphasis throughout is on individual participation within the group. Though a coordinator is available to provide expert advice, it is the participants themselves who determine what direction the discussion will take and how the various issues which arise should be resolved.

A project on continuing and postbasic education in advanced family health nursing was funded by the United Nations Fund for Population Activities (UNFPA) in March 1979 for the Governments of Antigua, Barbados, Dominica, Grenada, Montserrat, St. Kitts-Nevis-Anguilla, St. Lucia, and St. Vincent. This project was formulated over an 8-year period by health leaders in the English-speaking Caribbean, in collaboration with PAHO/WHO. The headquarters for the project is in St. Vincent.

In recognition that nursing manpower forms the core of primary health care in these countries, and that ministries of health and nursing leaders have identified additional training as a priority in meeting health needs of the Region, a major component of the project is for training activities.

The project supports regional multidisciplinary continuing education in the management of family health services and local continuing education for all levels of personnel, based on a country's specific needs and priorities. The project also supports a 10-month postbasic course in advanced family health nursing (family nurse practitioners) for graduate nurse-midwives. This course is based in St. Vincent.

The objectives and content of the postbasic course, as well as all continuing education activities, are based on the priorities and needs of the health services in participating countries to assist in extending coverage and quality of services. Since accessibility of immunization is a priority health program for participating countries, and since the target set by the World Health Assembly for the EPI is to provide immunization services to all children of the world by 1990, the EPI training package is included at all levels of continuing education activities and the postbasic family nurse practitioners course.

EPI personnel, together with the Caribbean Epidemiology Centre (CAREC), collaborated with PAHO's Division of Comprehensive Health Services in integrating the EPI training materials into the first workshop on the management of family health services, held in Basseterre, St. Kitts, from 26 November to 13 December 1979. This workshop marked PAHO's first attempt to integrate EPI training activities into a broader context of continuing education in health; it was also the first EPI workshop to be presented for participants from English-speaking countries in the Caribbean. The EPI training materials, through continued collaboration with CAREC, will be included in regional and local continuing education activities in the Caribbean, as well as the postbasic course sponsored by the UNFPA project. Annex I gives a summary of all EPI workshops held during 1979.

A series of national EPI workshops is planned for 1980. These will be held in Argentina, Brazil, Chile, Honduras, Nicaragua and Paraguay. One subregional EPI workshop will be held at CAREC in Port-of-Spain, Trinidad and Tobago, for national program officers from 19 English-speaking Caribbean countries and territories.

Another EPI workshop will be held for participants from all Latin American Schools of Public Health. The aim of the workshop is to encourage the national institutions which train health personnel to consider including this educational material within their regular curricula. Annex II shows the countries which held EPI workshops during 1979, as well as those that have scheduled EPI workshops for 1980.

2.2 EPI Revolving Fund

2.2.1 Operations

A final tally for all 1979 shows that more than 40 million doses of vaccines, costing in excess of US$2.1 million, were purchased through the EPI Revolving Fund during its first year of operation. This figure represents some 3 million more doses than had been indicated by early 1979 estimates; however the Fund was able to meet all vaccine requirements, despite difficulties in maintaining adequate capitalization.

Overall, reimbursement to the Fund by participating countries was satisfactory in 1979. However, there were some instances of delinquent accounts, with certain countries accumulating as much as US$200,000 in overdue payments. Another problem causing delays in the flow of monies back to the Fund was the excessive length of time--averaging 5 weeks--between shipment of vaccine orders to countries and final billing by vaccine suppliers. New procedures are being developed to reduce the billing time for 1980 orders.

Out of approximately 200 shipments in 1979, only two were lost enroute to their respective consignees. Both lost shipments were destined for small islands in the Caribbean where communications are difficult. In order to avoid similar problems in the future, it has been suggested that the total annual vaccine requirements for the smaller islands in the Caribbean be sent in a single shipment. This possibility is currently being discussed with the appropriate ministries of health.

Most vaccines ordered through the Fund have been delivered on or ahead of schedule. In some cases vaccine deliveries have been expedited to meet emergencies or special requests. For example, Honduras requested that its first quarter 1980 requirements be shipped in the last quarter of 1979. This rapid handling of urgent orders was aided by PAHO's contractual relationship with the various suppliers.

PAHO was able to extend the contracts for EPI vaccines until July 1980, when new contracts will take effect. Tenders for the new contracts are expected to go out during the second quarter of 1980. A summary of the participating countries and their 1979 vaccine requirements is shown in Annex III.

The EPI Revolving Fund initiated its second year of operations with the participation of five new members: Venezuela, Suriname, St. Lucia, Grenada, and St. Kitts, making a total of 28 countries and territories which have elected to procure their EPI vaccine requirements through the Revolving Fund.

Vaccine orders for the first and second quarters of 1980 are up by 5.5 million doses, or 30 per cent. Twenty-seven of the 28 participants in the Revolving Fund for 1980 have placed first and second quarter orders totaling US$1,315,419.

Out of the 23.6 million doses ordered for the first two quarters of 1980, the orders for polio vaccine accounted for 9.5 million doses, or 40.4 per cent of all doses procured. DPT vaccine accounted for 6.1 million doses, or 25.7 per cent, followed by BCG vaccine, which accounted for 3.6 million doses, or 15.1 per cent of all doses procured. Measles vaccine accounted for only 2.9 million doses, or 12.1 per cent, while TT vaccine accounted for 1.4 million doses, or 6.1 per cent of the total number of doses procured for the first quarter.

2.2.2 Capitalization

Although the feasibility studies for the establishment of the EPI Revolving Fund indicated that a total of US$4,000,000 would be needed for its smooth operation, the Fund was authorized by the XX Pan American

Sanitary Conference with an initial capitalization of $1,000,000. This insufficient capitalization meant that the Revolving Fund, which had originally been conceived to cover both vaccines and cold chain equipment, had to be limited to orders for vaccines only.

To keep vaccine requests within the $1,000,000 limit, Argentina, Colombia, and Peru were asked to pay part of their vaccine costs in advance. This mechanism enabled the Fund to begin operations in 1979.

Two other events were also of major importance in permitting the Fund to meet the 1979 vaccine requirements of all participating national EPI programs: the Netherlands donation of US$500,000 (which was channeled through the WHO Voluntary Fund for Health Promotion (VFHP)) and the decision of the XXVI Meeting of the Directing Council to allocate $800,000 from the Working Capital Fund to the Revolving Fund. However, estimates for 1980 show that vaccine requirements are up by 17 per cent, or 6.8 million doses. This means that an additional $1.7 million, at 1979 prices, will be needed for efficient operations in 1980. More importantly, the increased demands on Revolving Fund monies will require that participating countries reimburse the Fund promptly to ensure that sufficient funds are available for each quarter.

2.3 EPI Vaccines

2.3.1 Production

One or more vaccines for the EPI program are produced by 20 government laboratories in 12 countries in Latin America; only very few of them use reasonably modern equipment and effective production methods, and are economically sound. Budget restrictions of the vaccine-producing laboratories have hampered the import of high-cost technology needed to meet the standards recommended by WHO. Notwithstanding these difficulties, a few countries have made a genuine effort to modernize their laboratories.

In Brazil, while most of the freeze-dried BCG and DPT vaccines required for the national program are being produced locally, some of the pertussis component is imported in bulk. However, as the Instituto Butantan has stepped up its production capacity by changing over to the fermentation technology, the present shortage in the production of pertussis will soon be corrected.

In Mexico, the new laboratories for DPT, polio and measles vaccines will more than double Mexico's DPT production capacity within two years, and enough polio and freeze-dried live attenuated measles vaccines will be produced to meet the requirements of the national immunization program.

In Chile, the Instituto de Salud Pública (previously the Instituto Bacteriológico de Chile) has a new department for diphtheria and pertussis vaccines, and its equipment is being adapted for fermentation technology. Technical assistance has been provided to Chile for the production of DPT and BCG vaccines.

A survey of the vaccine production and control laboratories has been undertaken in all five Andean Pact countries: Bolivia, Colombia, Ecuador, Peru, and Venezuela. The Andean experts, who met under the Hipólito Unanue Agreement, recommended to the Ministers of Health of these countries the strengthening of their respective national laboratories and the establishment, with the cooperation of PAHO, of a subregional laboratory for biologicals for the Andean Pact countries.

2.3.2 Control

Until recently, inadequate government support in strengthening the control of biologicals was a matter of great concern. Fortunately, the situation is gradually improving, although one would wish to see an intensification of government efforts in this important area. Brazil is building a complex laboratory for testing drugs and biologicals at the Fundação Oswaldo Cruz (FIOCRUZ); this is part of the regulatory system for vaccine control which would involve not only the Ministry of Health and the Ministry of Social Security, but the Central de Medicamentos (CEME) as well. In the same context, Bio Manguinhos (FIOCRUZ), one of the principal vaccine manufacturers, has also refurbished its internal control laboratory.

Mexico has commissioned and staffed new laboratories for the control of DPT and polio vaccines at the national level. A specific pathogen-free animal facility is being installed; the laboratory now functions as the National Control Laboratory under the Directorate-General of Laboratories. In Argentina, the Department of Control has been renovated and a new wing has been added to accommodate the laboratories for the *in vivo* testing of bacterial and viral vaccines. In Chile, the breeding of small animals used for vaccine control has been intensified, and new premises provided; a plan for monitoring the efficiency of operations in areas of production and control has also been put into effect

While PAHO cooperates technically in strengthening national control capability, it urges vaccine producers to submit their production as well as their control protocols for auditing; also, controllers are encouraged to send their vaccines for external testing by one of the four reference laboratories designated by PAHO. By comparing their results with those of the reference laboratories, national controllers have an

excellent opportunity to improve their testing ability and establish self-confidence in testing the potency of vaccines. During January-August 1979 the reference laboratory in Mexico tested 28 lots (14 polio and 14 measles), most of the them referred from the field by the EPI programs. Reference services by the Bureau of Biologics (PAHO-designated reference laboratory for testing DPT) were provided to Colombia, Ecuador, Peru, and Venezuela.

To facilitate the understanding of the importance of control, UNDP funds made it possible to hold three courses on the control of immunobiologics: two courses in Mexico in 1978, and a third on the titration of viral vaccines in Buenos Aires in November 1979. The latter course was attended by 12 participants from Argentina, Brazil, Honduras, Jamaica, Panama, Mexico, and Venezuela, bringing to 53 the total number of scientists trained in the three vaccine courses.

Reagents and international standards have been procured by requesting laboratories; also, two preparations, one on diphtheria toxoid and another on tetanus toxoid, which had satisfied WHO requirements on potency and stability, were distributed as PAHO working references.

Four laboratory manuals--on the production and control of diphtheria, tetanus and pertussis, and on laboratory design--have been distributed to DPT vaccine manufacturers and controllers in the Region.

2.3.3 Laboratory Surveillance of Vaccines

Vaccine testing is required not only by an Act on Drugs and Biologics as part of a national regulatory system, but also, and even more importantly, as a tool for the surveillance of vaccines used in the EPI program. Because vaccines are perishable items and hence their stability cannot be depended upon, governments which have embarked on an EPI program are strongly advised to operate some modest laboratory facility to serve the immunization program by adequately checking the potency of vaccines. Such testing would normally be performed prior to vaccine procurement in order to check compliance with requirements on safety and potency at regular intervals; samples returned from the field would also be tested in order to monitor the efficiency of the cold chain and as a way to supervise the staff. Such surveillance is necessary as part of the immunization program and should operate irrespective of whether the country is producing vaccines or not. PAHO has trained a number of scientists in titration of viral and bacterial vaccines, but it is apparent that only very few have had the possibility to apply their knowledge and skill to these activities.

With regard to technical cooperation, it would benefit vaccine manufacturers to participate more regularly in PAHO-sponsored vaccine testing programs, which are operated by its network of vaccine reference laboratories. By submitting their products for regular testing by the reference laboratories, governments will not only improve the competence of their testing laboratories and thus strengthen the impact of the EPI program on disease morbidity and mortality, but also, as consistency in quality is achieved, their products will be available for international trade in the event of a surplus in production. This service is provided free by PAHO, and governments are invited to make greater use of the services provided by the reference laboratories.

In vaccine producing countries, governments should give an important priority to the development of internal control at the level of the manufacturer and, whenever feasible, operate a national control independent of the manufacturer. Likewise, governments should facilitate procedures so that their national control laboratories participate more vigorously and regularly in PAHO's program for the external testing of vaccines, which is operated by its network of vaccine reference laboratories.

2.4 Information Systems and Evaluation

Progress in this area remains slow, not only because of the constraints imposed by the scarcity of EPI management staff at the national level and within PAHO/WHO, but also because of the slow development of national health information systems. During 1979 an information system for the EPI program was proposed and is now being implemented; this system calls for countries to submit to the regional office information which is appropriate to the stage of development of the national program.

This system emphasizes the collection of data geared to the high priority age groups which are the target of the Program, particularly, children under one year of age and pregnant women.

Of particular importance are information systems for measuring a) vaccination coverage, and b) morbidity and mortality. The implementation of these systems will permit the evaluation of these programs, which is the fundamental mechanism by which other facets of program activity can be improved, and without which EPI objectives can be neither measured nor achieved.

Program evaluation is taught in the EPI training courses. Emphasis is placed on reviewing operations through frequent supervisory trips to provide supportive guidance to peripheral staff, and on the performance of sample surveys either for routine use in the assessment of vaccination coverage, or for exceptional use to estimate the incidence of clinical disease or to perform serological studies.

Other aspects of evaluation which should receive increasing emphasis include comprehensive program reviews with the involvement of independent staff ("program audits") and strengthening of disease surveillance. Simple systems of data collection, analysis and use, including those applicable at the local level, are now being developed in the format of a manual for surveillance of the EPI diseases. This manual is expected to be ready for distribution to countries in the second semester of 1980.

The evaluation of EPI can be a spearhead in the development of periodic reviews and replanning of other primary health care services.

Annex IV shows the status of immunization programs in the Region. These data are believed to provide an index to the progress of the regional program, though it is recognized that their incompleteness is itself a reflection of the stage of development of different countries' information systems.

2.5 Research and Development

2.5.1 Regional Cold Chain Development Center

Resolution XXI of the XXVI Meeting of the Directing Council requested the Director to study the possibility of establishing a regional focal point for cold chain equipment development and testing in order to support these delivery systems. In this connection, PAHO has signed an agreement with the Ministry of Public Health of Colombia and the Center for Multidisciplinary Studies in Rural Development (Centro de Investigaciones Multidisciplinarias para el Desarrollo Rural (CIMDER) in Cali, Colombia, for the establishment of a regional center for the development and testing of cold chain equipment.

This project aims to ensure that all EPI programs in Latin America, and that of Colombia in particular, make use of cold chain equipment which meets their common needs for vaccine storage and transportation in the Region. In order to assure adequate and efficient attention to these necessities, the agreement establishes the following objectives:

a) Cooperation between personnel of CIMDER and EPI/Colombia;

b) Constant attention to the necessities of other EPI programs in Latin America;

c) Careful evaluation of the possibilities for Latin American industry to supply equipment to the EPI;

d) Rigorous laboratory testing of equipment prior to its large-scale manufacture; and

e) Constant evaluation of equipment used in the field on a large scale.

2.5.2 Optimum Age for Measles Vaccination

Vaccinating a child is a time-consuming and costly process. With so much effort and cost going into each vaccination, it is most important that the vaccinations given be as effective as possible in terms of greatest protection for the child. Scientific discussion has arisen as to the best time to give measles vaccine, presently the most expensive of the EPI vaccines, to protect the child at the earliest possible age, yet after the protection and interference of maternal antibodies has ended.

Maternal antibodies against measles are transmitted through the placenta. These antibodies provide infants with some protection against measles in the first several months of life, and also interfere with production of measles antibodies following vaccination in very young infants.

Measles vaccine is expensive. In order to gain the maximum benefit from this investment, children should be vaccinated as soon as possible after the maternal antibodies will no longer interfere with the antibody response following vaccination, but before the children have had an opportunity to develop measles. Therefore, the final decision as to the optimal age of vaccination is also dependent on the morbidity and mortality caused by measles in the first year of life in a particular geographic area.

With the primary objective of determining the immunological effectiveness of administering measles vaccine to children between 6 and 12 months of age in Latin America, investigators in four countries--Brazil, Costa Rica, Chile, and Ecuador--are conducting an inter-American study with the cooperation of PAHO/WHO. The field activities for this project have already been completed in the four countries, and the testing of samples has been started at the reference laboratory "Instituto

Evandro Chagas," in Belém, Brazil. Final results of the study are expected to be completed during the second semester of this year.

3. The EPI and "Health for All by the Year 2000"

Immunization services are included in the Declaration of Alma Ata among the elements of primary health care, and the EPI's goal of providing immunizations for all children by 1990 is a stepping stone toward the more challenging target of ". . .the attainment by all citizens of the world by the year 2000 of a level of health that will permit them to lead a socially and economically productive life. . . ." In achieving its own goals, the EPI contributes directly to the broader goals of primary health care. The EPI seeks to establish permanent immunization services which reach a high proportion of newborns and pregnant women, as these populations are continuously being replenished. Such services are most cheaply and most sensibly provided as a component of more comprehensive preventive and curative health services, as, for example, maternal and child health services. The EPI is therefore committed to primary health care by intent, as well as necessity, as this approach provides the most rational context for the provision of immunization services.

In expanding the provision of immunization services, attention is first paid to immunizing children and pregnant women who are already utilizing fixed facilities. Next, outreach services are provided to populations which can be reached from the fixed facilities during regularly scheduled weekly or monthly visits. These services should not necessarily be limited to immunization. Finally, aided by the experience gained in accomplishing the above, the far more difficult questions of how and in what time frame to provide services to the remaining population which cannot be reached from existing facilities can be adequately addressed.

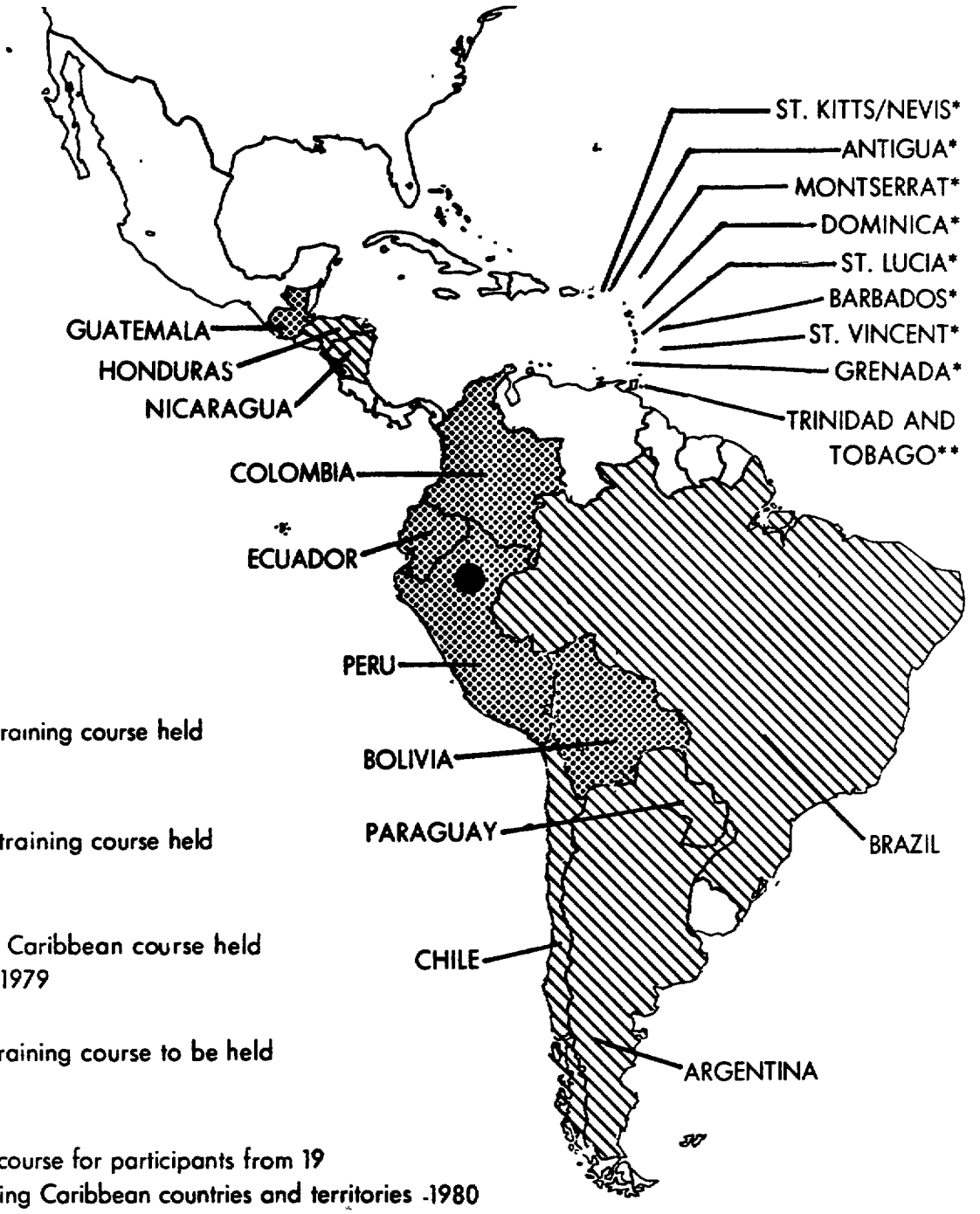
Immunization coverage is easily measurable and directly related to reducing morbidity and mortality. It serves as an important index of the performance of health programs. Because they are among the simplest and least expensive of health services, immunizations can also serve as an opening wedge in expanding the provision of primary health care services to unserved communities. It is health workers who bear prime responsibility for the provision of immunization services, and thus immunization coverage provides a clearer index of the success of efforts within the health sector than indices of other programs (such as environmental sanitation, clean water and nutrition), which require actions from several other sectors. All these factors make the progress being achieved in the EPI an important index of WHO's progress in achieving "health for all by the year 2000."

Annexes

1979 EPI WORKSHOPS

Workshop	Place	Date	No. of Participants
II Regional Course for EPI Managers	Lima, Peru	15-26 Jan.	45
National EPI Workshop	Lima, Peru	26 Feb.- 3 Mar.	46
National EPI Workshop	Cochabamba, Bolivia	18-23 Jun.	81
National EPI Workshop	Bogotá, Colombia	2-7 Jul.	35
National EPI Workshop	Guatemala, Guatemala	5-9 Nov.	66
National EPI Workshop	Baños, Ecuador	19-23 Nov.	58
National EPI Workshop	St. Kitts, W.I.	10-14 Dec.	42
Total number of participants			373

Participants in 1979 and 1980 EPI Training Courses



EPI REVOLVING FUND SUMMARY FOR 1979

Vaccine orders placed (in thousand of doses) by participating countries and territories for calendar year 1979

Country	DPT	Polio	Measles	BCG	TT
Anguila	2.0	2.0	-	-	.6
Antigua	6.0	6.0	-	0.2	10.0
Argentina	1,000.0	3,500.0	1,000.0	2,000.0	625.0
Bahamas	34.2	26.3	8.0	7.0	5.3
Barbados	18.0	20.0	8.0	10.0	12.4
Belize	-	-	60.0	14.0	60.0
Bolivia	200.0	565.0	40.0	-	-
Cayman Islands	1.2	1.2	1.6	1.0	1.6
Colombia	4,500.0	5,500.0	2,200.0	1,250.0	-
Costa Rica	-	100.0	40.0	-	-
Dominica	3.0	-	-	-	5.0
Dominican Rep.	600.0	800.0	400.0(a)	200.0	300.0
Ecuador	-	1,500.0	500.0	300.0	-
Guyana	264.2	233.76	-	10.0	17.15
Haiti	350.0(b)	-	15.5(b)	325.0(b)	232.0(b)
Honduras	375.0(c)	50.0	50.0(b)	180.0	-
Nicaragua	267.0(b)	958.0(a)	113.0(b)	107.0(b)	87.0(b)
Panama	200.0	1,175.0	180.0(a)	60.0	190.0
Paraguay	739.525	-	5.0(b)	-	-
Peru	1,100.0	2,000.0	840.0(a)	1,750.0	-
St. Vincent	59.22	39.66	19.4	22.4	22.2
Turks and Caicos Is.	0.8	0.4	0.3	0.4	0.4
Uruguay	-	600.0	-	-	-
Total doses	9,720.145	17,077.32	5,480.8	6,237.0	1,568.65
Cost (US$)	307,054.04	334,330.40	1,237,422.0	189,411.0(d)	30,189.37

Cost of EPI vaccines	US$2,098,406.81
3% Administrative charge plus shipping costs	346,577.88
Subtotal	2,444,984.69
Cost of other EPI related vaccines	164,104.98
Total cost in 1979	$2,609,089.67

(a) Requirement partially procured with non-EPI funds
(b) Total requirement procured with non-EPI funds
(c) First quarter 1980 requirement procured fourth quarter 1979
(d) Does not include cost of diluent

SUMMARY OF STATUS OF IMMUNIZATION PROGRAMS IN THE AMERICAN REGION

Country	All vaccines used in EPI considered to meet WHO requirements 1979 (a)	Prog Mgr named (b)	Estimated pop < 1 year (c) 1978	Vaccination Coverage in Children < 1 yr of age (prov) - 1978									Reported Cases per 100,000 Population - 1978				
				BCG	DPT			MEASLES	POLIO			TET TOX (d)	MEASLES	POLIO	WHOOPING COUGH	DIPHTHERIA	TETANUS
				(%)	I dose (%)	II dose (%)	III dose (%)	(%)	I dose (%)	II dose (%)	III dose (%)	(%)					
Argentina		yes	569,300	42	...	...	...	45	...	...	...	...	36.2	0.0	64.5	1.0	1.0
Bahamas	yes	yes	6,380	63	...	...	...	...	...	...	...	...	98.7	0.4	0.9	—	0.4
Barbados	yes	yes	4,050	...	79	77	66	...	74	72	59	8	14.0	—	5.6	8.0	4.8
Bolivia	yes	yes	193,500	...	20	10	2 (e)	9	20	10	2 (e)	...	51.7	0.3	4.2	0.8	1.8
Brazil		yes	3,735,500	40	40	44	10 (e)	39	43	31	41	7	42.4	1.2	28.1	4.2	2.6
Canada (f)	yes	yes	356,760										24.9	0.0	11.3	0.5	0.0
Chile		yes	259,910	81	94	90	91	81	92	89	88	...	141.7	—	8.2	4.9	—
Colombia		yes	804,400	35	30	20	14	7	30	19	14	...	79.7	1.2	62.2	0.7	2.9
Costa Rica	yes	yes	59,800	83	87	71	58	19	92	65	50	...	17.1	—	4.5	—	1.9
Cuba		yes	193,950	72	71	60	58	19	81	83	...	...	192.8	—	15.1	—	0.4
Dominica	yes	yes	2,760		90	56	53	47	18	12	17	...	—	—	54.3	—	3.7
Dom. Rep.	yes	yes	176,000	...	...	...	...	...	...	...	...	...	113.1	2.9	19.4	6.5	3.0
Ecuador		yes	301,000	84	26	16	...	11	23	12	7	2	11.1	0.2	25.1	0.3	1.5
El Salvador		yes	169,470	76	75	61	...	64	76	60	...	36	36.4	0.2	54.2	—	2.8
Grenada	yes	yes	3,330	...	...	...	...	...	...	...	...	...	203.1	—	—	—	5.2
Guatemala		yes	290,200	...	...	...	...	...	...	...	...	...	31.7	0.6	16.5	0.1	1.0
Guyana		yes	30,775	10	43	33	23	...	42	33	23	3	0.6	—	...	—	—
Haiti		yes	159,500	...	...	...	...	...	...	...	...	...	27.8	0.8	21.2	0.8	9.8
Honduras		yes	150,600	9	53	29	6 (e)	23	57	30	7 (e)	...	151.8	2.2	50.8	—	0.6
Jamaica		yes	71,660	...	...	...	...	...	...	...	...	...	37.4	—	1.2	0.5	1.1
Mexico		yes	2,638,000	...	...	...	...	...	...	...	...	...	4.6	1.1	4.6	—	0.7
Nicaragua		yes	89,290	26	39	28	20	...	77	69	18	...	6.7	0.0	26.0	—	0.5
Panama	yes	yes	59,400	56	61	45	33	37	85	46	34	19	128.5	—	5.0	—	1.5
Paraguay	yes	yes	112,300	...	...	...	...	...	...	...	...	...	38.0	2.3	49.6	0.2	9.3
Peru	yes	yes	648,000	67	40	24	18	21	48	28	20	...	31.6	0.8	61.1	1.3	5.0
Suriname	yes	yes	14,130	...	...	...	...	...	...	...	...	...	...	...	...	0.8	—
Trin. & Tob.		yes	23,700	...	60	51	39	...	67	57	45	...	67.8	—	2.0	—	1.1
U.S.A. (g)	yes	yes	3,203,000				72 (h)	44 (i)			49		12.3	0.0	0.9	—	0.0
Uruguay	yes	yes	54,500	...	90	68	55	22	81	54	...	36	19.3	—	39.3	—	0.5
Venezuela		yes	469,800	50	67	48	41	33	105	94	82	10	162.9	0.3	39.4	0.3	...

(a) In countries not listed as "yes", the status of one or more vaccines is either unknown, or known not to meet WHO requirements. All vaccines purchased through the EPI Revolving Fund meet WHO requirements.
(b) Part or full time
(c) Provisional PAHO estimates based on country population distributions and UN population estimates
(d) Coverage of pregnant women with two or more doses of tetanus toxoid
(e) Two-dose schedule used
(f) Canada does not collect vaccination data nationwide.
(g) Data from national survey of children 12-23 months of age
(h) Three or more doses
(i) Children 15-23 months of age

... Data not available

— No cases

Reported Cases of EPI Diseases in the Americas

NUMBER OF REPORTED CASES OF MEASLES, POLIOMYELITIS, TETANUS, DIPHTHERIA AND WHOOPING COUGH
FROM 1 JANUARY THROUGH THE LAST PERIOD REPORTED IN 1979
AND FOR THE COMPARABLE PERIOD IN 1978, BY COUNTRY

COUNTRY	DATE OF LAST REPORT	MEASLES		POLIOMYELITIS		TETANUS		DIPHTHERIA		WHOOPING COUGH	
		1979	1978	1979	1978	1979	1978	1979	1978	1979	1978
ARGENTINA	06 OCT	6,274	5,961	13	--	180	201	110	214	12,409	11,089
BAHAMAS	29 DEC	1,659	222	--	1	2	1	--	--	--	2
BARBADOS	29 DEC	16	35	--	--	7	9	13	20	2	14
BOLIVIA	11 AUG	1,855	...	371	...	73	...	25	...	782	...
BRAZIL	01 DEC	45,323	38,641	1,844	1,192	2,169	2,558	3,685	4,233	22,959	26,211
CANADA	29 DEC	22,527	5,865	3	8	...	5[a]	83	119	2,116	2,673
CHILE	15 DEC	33,285	12,143	--	--	...	17[a]	358	538	414	869
COLOMBIA	09 SEP	13,327	13,425	378	233	...	695[a]	120	134	8,411	11,309
COSTA RICA	29 DEC	6,883	355	--	--	23	40	--	--	311	93
CUBA	15 DEC	7,387	18,080	1	--	25	37	--	1	143	1,451
DOMINICA	29 DEC	178	--	--	--	2	3	--	--	1	44
DOMINICAN REP.	03 NOV	5,223	4,937	9	118	236	139	141	287	482	841
ECUADOR	24 NOV	3,987	714	5	15	80	108	17	20	1,859	1,845
EL SALVADOR	29 DEC	10,359	1,513	3	10[a,b]	114	112	--	5[a]	812	2,362
GRENADA	29 DEC	3	197	--	--	2	5	--	--	6	--
GUATEMALA	17 NOV	3,193	1,564	23	32	59	59	4	5	1,340	773
GUYANA	22 DEC	899[c]	11[c]	--[c,d]	2[c,d]	20[c,e]	16[c,e]	5[c]	1[c]	. .	..
HAITI	29 DEC	259	277	1	28	72	91	7	8	216	185
HONDURAS	31 DEC	4,895	5,219	226	74	47	36	2	1	2,451	1,746
JAMAICA	29 DEC	126[c]	4,900[c]	--	...	10[c,f]	27[c,f]	9[c]	17[c]	37	...
MEXICO	27 OCT	30,500	2,599	652	549	...	439[a]	...	12[a]	4,077	2,724
NICARAGUA	29 DEC	1,270	160	--	1	1	13	11	--	267	623
PANAMA	01 DEC	4,212	1,627	--	--	37	23	--	--	631	86
PARAGUAY	29 DEC	1,606	614	17	37	185	151	7	4	1,015	802
PERU	01 DEC	4,149	1,433	55	48	174	144	147	89	8,325	3,384
SURINAME	06 OCT	...	...	1	--	...	...	1	3	...	...
TRINIDAD & TOBAGO	29 DEC	394	768	--	--	32	13	1	--	47	23
U.S.A.	29 DEC	13,448	26,915	26*	15 ≠	75	85	65	76	1,394	2,065
URUGUAY	30 NOV	1,196	479	1	--	14	22	--	--	194	985
VENEZUELA	29 DEC	20,663	17,008	52	17	...	...	3	27	1,736	4,110

[a] Source: Annual PAHO/WHO questionnaires
[b] Paralytic cases only
[c] Source: CAREC Surveillance Report
[d] Figures for poliomyelitis up to 30 December
[e] Figures for tetanus up to 20 November
[f] Figures for tetanus up to 29 September

-- No cases
... Figures not available
* 22 paralytic cases
≠ 9 paralytic cases