

Pan American Health Organization

PAHO/ACMR 16/7
Original: English

SIXTEENTH MEETING OF THE
PAHO ADVISORY COMMITTEE ON MEDICAL RESEARCH

Washington, D.C.
11-15 July 1977

IMMUNIZATION TASK FORCE

The issue of this document does not constitute formal publication. It should not be reviewed, abstracted, or quoted without the consent of the Pan American Health Organization. The authors alone are responsible for statements expressed in signed papers.

WORKING PAPERS

INTER-DIVISIONAL WORKING GROUP ON
THE EXPANDED PROGRAM ON IMMUNIZATION IN THE AMERICAS*

*Presented by Dr. Ciro de Quadros, Division of Communicable Diseases,
Pan American Health Organization, Washington, D.C.

DRAFT

HPC: Tuesday ~ 9 March

PROPOSAL FOR THE EXPANDED PROGRAM ON IMMUNIZATION IN THE AMERICAS

The diseases that are preventable through immunization continue to occupy a very important place as causes of morbidity and mortality in the Region, particularly in the age groups below 5 years of age in rural and periurban areas.

PAHO/WHO is continuing its cooperation with the member countries to obtain levels of immunization in order to decrease morbidity and mortality due to diphtheria, tetanus, whooping cough, poliomyelitis, measles and tuberculosis.

All countries in the Region have already established targets for vaccination programs, following the recommendations of the Ten Year Health Plan for the Americas and Resolutions WHA27.57 of the World Health Assembly; CD20.22 of PAHO Directing Council; and CE74.R9, ~~CE75.R10~~ of PAHO Executive Committee.

Major problems which still must be overcome include low priority given to immunization budgets of some countries, the absence of a reliable source of vaccines at the lowest possible prices, the lack of surveillance which identifies under-immunized groups or outbreaks of disease promptly enough so that corrective action can be taken, and the limited emphasis on the operational aspects of immunization activities. Operational research to improve the effectiveness of "cold chain" for vaccines which require refrigeration, simplified vaccination schemes, as well as more mobile field equipment to transport and administer vaccines, are needed.

Following the two workshops that were held to introduce the PAHO/WHO Expanded Program on Immunization to Middle America, national workshops are now being planned for 1977-1978 in follow-up to the 1976 meetings and the larger countries of South America.

At central level the Director appointed an inter-divisional Immunization Task Force to analyze the constraints for the implementation of the Program and to make recommendations on how to promote the development of national programs which effectively utilize existing or planned primary health care and maternal and child health, multiple antigen administration, simplified vaccination schemes, establishment of a rotating fund for facilitating the purchase of vaccine and improvement of local production of vaccine with proper quality control.

The main objectives of PAHO technical cooperation are:

- To cooperate with the member countries in the identification of problem areas and the redesign of immunization programs.
- To promote training of personnel in the administrative, managerial and operational aspects of these programs.
- To cooperate with the member countries in the design, establishment and implementation of surveillance mechanisms to evaluate the coverage and immunity status of the target populations.
- To collaborate with member countries in preparing manuals, norms, procedures and strategies for the implementation of these programs.
- To implement the rotating fund for purchase of vaccine by member countries as a medium-term solution.

- As a long-term goal to support and encourage self-sufficiency in the production of vaccines which meet WHO standards.

For 1977-1978 the main activities will be targeted towards:

- Evaluation of the different levels of ongoing immunization programs in the Region and potential for formal participation in the PAHO/WHO EPI.

- Identification through operational research of problem areas mainly related to the "cold chain" and the operational aspects of these programs.

- Identification of the different tasks performed by the personnel involved in the primary health care and maternal and child health for development of a curriculum for training.

- A PAHO Epidemiologists staff meeting for introduction to EPI and in-service training.

- An Area-IV workshop with identical purpose of the ones held for Central America and Caribbean countries in 1976.

To implement these activities, provision is made for technical and general services personnel, short-term consultants, supplies and equipment and fellowships as well as supporting costs for seminars and their related items. Grants would be utilized for items such as the development of a training curriculum for national managers and personnel in the intermediate levels; research grants to institutions to be devoted to development of more stable vaccines; and support to collaborating laboratories for the potency testing of vaccines and support to serologic studies.

EXPANDED PROGRAMME ON IMMUNIZATION (EPI)

PROGRAMME STATEMENT (DRAFT)

I. Need for Programme

- A. Each year more than 80,000,000 children are born in the developing world. Less than 10% of them receive immunization against diphtheria, whooping cough, tetanus or poliomyelitis. A higher percentage receive BCG and fewer than 5% receive potent measles vaccine.
- B. Approximately 5,000,000 children per year die from these diseases.
- C. In addition to those who die, at least twice as many are disabled through brain damage, paralysis, stunted growth, deafness and blindness.
- D. While precise data on worldwide morbidity are not available, estimates of the importance of these diseases can be made:
 1. Diphtheria. In parts of the developing world diphtheria is still a rare disease because immunity is developed early from diphtheria skin infections. Incidence, however, is increasing with urbanization. Diphtheria is now a common disease in some parts of the developing world where the reported mortality is 10 to 20 times greater than in developed countries.
 2. Whooping Cough. Surveys show both that whooping cough has a high incidence (80% of all children will contract the disease) and that it carries a high mortality (the case fatality rate is between 1% and 3%) particularly in the first two years of life.

3. Tetanus. The estimated annual number of deaths from tetanus in the world is 50,000 but the incidence and mortality vary greatly in different parts of the world. In some areas rates of 60 per 100,000 have been reported in the total population along with neonatal deaths rates of 100 per 1,000 live births. These high rates are from developing countries in which, therefore, tetanus is one of the major causes of death from preventable diseases.
4. Tuberculosis. In a study of death rates in groups of developed and developing countries the reported death rates from tuberculosis were at least three times higher in the developing than in the developed countries. Since we know reporting is as poor in tuberculosis as in other diseases in the developing world, the incidence is probably at least ten times as great.
5. Measles. 500,000 West African children die from measles each year, most between one and two years of age. It is a killing disease to a lesser degree in other parts of Africa and many countries in Latin America and Southeast Asia. In some countries in Asia and the Western Pacific, on the other hand, it is rather mild. Throughout the developing world 95% of children who survive the first few years develop a recognizable clinical attack of measles and may develop one or more respiratory, neurological or ophthalmic complications.
6. Poliomyelitis. In Rangoon a survey of children attending school revealed that 20 per thousand had paralytic disabilities typical of those of poliomyelitis - a rate higher than in the

United States in its prevaccination period. A similar survey in Ghana of school entrants showed 7 per thousand. In contrast a survey in Central Java indicated only 0.009 per thousand.

- E. Effective vaccines exist against all of these diseases. These vaccines give good protection provided they are potent at the time of administration and the dosage is adequate.

TABLE 1 - LEVEL AND DURATION OF PROTECTION GIVEN BY VACCINES INCLUDED IN THE EPI

<u>Vaccine</u>	<u>Level of Protection</u>	<u>Duration of Protection</u>
Measles	95%	At least 15 years, probably for life
Poliomyelitis	95%	At least 15 years, probably for life
BCG	80%	10 years
	70%	15 years
Diphtheria	95% +	Life long (with boosters)
Tetanus	95% +	Life long (with boosters)
Pertussis	75%	Life long (with boosters)

II. Programme Objectives

- A. Morbidity reduction. The primary health objective of the programme is reduction in morbidity from these six diseases.
- B. Population to be vaccinated.
1. The secondary objective of the programme is immunization of the maximum number of susceptibles. In most developing countries not more than 10% of the susceptible population is being immunized at the present time. If an additional 10% is added each year in those countries which start expanded programmes in 1977 then a level of 60% can be achieved in these countries by 1982. The long-term objective is 80% coverage.

2. Many countries will prefer to limit the primary target population, at least during the first five years to children under 15 months of age and pregnant mothers. This will permit them to concentrate on that group where the impact of communicable diseases is most severe. If programmes develop smoothly during the initial five-year period, consideration can be given to adding additional age groups after 1981. At that time it will be possible to add DT and BCG boosters as well. Other countries may wish to add additional target groups from the beginning.
3. It is important that the programme expands gradually and carefully so that it can build on a base of successful experience.
4. The experience gained in these first five years may make it possible to expand more rapidly after 1981, both in terms of new geographic areas as well as additional hard to reach population.

III. Programme Activities

Developing countries are carrying on a wide variety of immunization activities at the present time, and expanded programmes and their objectives will be different in different areas. Certain elements, however, will be common to all countries.

A. Government commitment. Before actually beginning its programme, it is important that each country indicates its commitment to expansion by:

1. including immunization in the government's overall health plan or policy;

2. having a budget allocation specifically designated for expanded immunization activities;
3. having a full-time national immunization programme manager appointed with clearly defined responsibilities for expansion activities.

B. Government planning and implementation.

1. The first step in planning will be completion of "National Inventory of Current Immunization Activities and Needs". This will serve:
 - (a) To indicate which diseases may justify an expansion of current efforts in immunization or require further epidemiologic study;
 - (b) to show where the information necessary for better planning and management of immunization programmes is lacking, incomplete or unreliable;
 - (c) to help identify operational problems and impediments to current immunization activities;
 - (d) to provide a baseline of present achievements and the resources being used to attain them so that future objectives can be more confidently stated, time-table targets more precisely set, the need for more epidemiologically effective strategies clarified and resources more effectively allocated.
2. In its plan each country will:
 - (a) indicate its objectives both in terms of cases and deaths prevented and populations to be immunized;
 - (b) present a schedule of the target areas and populations to be immunized for each year.

- (c) outline the programme's organizational structure and describe the responsibilities and relationships of each position;
- (d) describe the specific culturally acceptable strategies to be used;
- (e) describe supply, transport and cold chain systems;
- (f) indicate how programme activities will be monitored and controlled;
- (g) present a detailed budget for the first five years indicating the economic feasibility of the programme;
- (h) include a detailed manual of operations describing how the various specific activities are to be carried out.

C. PAHO/WHO can make the following services available.

- (a) determination of those countries where expanded immunization programmes are particularly promising;
- (b) establishing vaccine control laboratories for the use of those countries which do not have a suitable national laboratory;
- (c) assistance in training of country staff;
- (d) assistance in preparation of operations manuals;
- (e) assistance in planning, implementation and evaluation of national programmes;
- (f) assistance in ordering transport, supplies and cold chain equipment, paid for out of national budgets;
- (g) coordination of international and bilateral aid to country programmes;

- (h) assistance with curricula and organization of training workshops and field exercises in countries with programmes, for both national managers and PAHO/WHO Area and field staff;
- (i) support of national vaccine production programmes through planning, training, equipment and cooperation;
- (j) organization of a revolving fund for vaccine procurement in "hard" or local currencies from national budgets;
- (k) support and implementation of operational field research.

IV. Programme Monitoring and Evaluation

A. Surveillance.

1. The ultimate evaluation of a country's immunization programme must measure the programme's effectiveness in achieving its primary objective, reduction in morbidity of the six immunizable diseases. Surveillance systems in the developing countries do not accurately reflect disease trends. Each country with an EPI, therefore, will first analyze its surveillance system and then develop a plan to increase that system's utility. In most countries this will involve shortening the list of reportable diseases, simplifying reporting mechanisms, increasing the system's response capability and tightening the monitoring of the system's accuracy.
2. Other efforts to measure the programme's effect on morbidity will include monitoring of selected sentinel hospitals and health centres, periodic sample surveys using historical recall information and periodic disease sequellae surveys.

B. Immunity. By combining high coverage with vaccine of proven potency countries can obtain estimates of their disease reducing capability even when their surveillance systems are imperfect.

1. The ability of the programme to immunize the population it vaccinates will be measured by periodic testing of vaccine potency. In each country a schedule of vaccine testing points will be developed.

Such a schedule will include:

(a) at selected times when vaccine is returned from the field by a vaccination unit to a storage centre;

(b) whenever a vaccine lot nears its expiration date;

(c) whenever storage conditions have been of doubtful reliability.

2. In addition to vaccine testing, the programme's immunizing capability may be evaluated in selected areas by serologic surveys. Because of the cost and difficulty involved in such surveys, however, these are not being recommended as part of a routine evaluation system.

C. Coverage evaluation. Evaluation of immunization coverage will take place both concurrently with immunization activities and as part of periodic independent evaluation. Either a "marker" or a vaccination certificate will be used as an indication of vaccination history.

1. Concurrent assessment. One of the responsibilities of each country's central office staff will be assessment of the extent to which vaccination units are actually reaching their designated target populations. In some areas assessment will be one of the responsibilities of a national epidemiologic unit. Assessors will routinely select and visit a large enough sample of the target

population to derive statistically valid conclusions on the percentage of that population vaccinated. This information will be given to supervisors and when coverage is low modifications in programme strategy and operations will be made.

2. On an annual basis an independent team of evaluators made up of experienced personnel from PAHO/WHO and other health agencies will evaluate each country programme. As part of this evaluation they will determine the percentage of the target population actually vaccinated by examining randomly selected population clusters.

D. Management evaluation

1. Supervisory and central office staff will routinely monitor all of the programme's operational elements. PAHO/WHO will assist as requested with guidelines, checklists and other technical information.
2. The team conducting the annual independent evaluation will have as its primary mission the systematic examination of critical operational areas such as cold chain, personnel recruitment and training, supervision, transport, logistic support, advance notification and vaccination techniques. Results of this evaluation will be used to make necessary programme modifications.

TASK FORCE

1. List of points suggested by HS to be considered at the TASK FORCE meeting (2/24/77). Immunization activities are a priority aspect in any primary health care program.
2. Programs for expansion of coverage exist in almost all countries. Those programs are characterized by different degrees of development and different methods. For this reason, it does not seem necessary to create pilot projects but rather to utilize, strengthen and improve the existing health infrastructure, such as malaria services, eradication of smallpox and Aedes, etc.
3. It would be advantageous to bear in mind the following criteria for determining the countries in which the continent-wide program will be initiated.
 - A. Existence of policies which give priority to the development of programs for the control of communicable diseases (immunization).
 - B. Countries with the most problems in those communicable diseases which can be controlled through known immunization techniques.
 - C. The country's economic and financial potential which will facilitate implementation of such a program.
 - D. Existing infrastructure (permanent, malaria program, measles, etc.) or infrastructure which must be developed.
 - E. Advantages of selecting countries in each subregion (Caribbean, Andean Region, Central America, etc.).
 - F. Regional influence with PAHO/WHO cooperation.

G. Strengthening immunization programs within the expansion of coverage and primary care.

4. There is a need to confirm, identify and acquire a better understanding of the critical areas which have either avoided or impeded the effective development of immunization programs. Therefore, it is recommended that a brief analysis of conditions in selected countries be made.

5. It seems that the most important problems are administrative and logistic problems on all levels of the health systems structure. Therefore, the Health Services Division is ready to aid in searching for solutions to these problems.

6. From the point of view of primary care, the problem exists under two different conditions:

- a. When there is an infrastructure; and
- b. When there is no infrastructure.

In the latter case, the basis of the program will be the periphery and primary health units in the health care system which support the program through the use of different strategies for utilizing the sectors of the private or official institutions which exist even on the community level in scattered populations. For example, this includes semi-vehicle programs, health activities carried out by nursing services of a military border force, religious missions, teachers, local volunteers, etc.

7. The utilization of the resources of the traditional community health system (lay midwives, druggists, herbalists, preachers, witch doctors, etc.) is considered essential for the program to achieve total coverage, especially in periurban and rural populations.

8. It is advisable to bear in mind the outlines for work with communities which is contained in the manual recently prepared by WHO with the aid of PAHO.

9. In the light of our knowledge of national programs and the implementation of these programs in the countries, we suggest that Brazil, Costa Rica, Peru, Jamaica and Paraguay be considered.

EXPANDED PROGRAM ON IMMUNIZATION (EPI)

REVOLVING FUND (RF) PROPOSAL

1. Purpose

The purpose of this paper is to recommend a procedure for the operation of a Revolving Fund to finance Expanded Program on Immunization (EPI) procurements for member countries unable to deposit funds with the Pan American Health Organization (PAHO) in U.S. currency in advance of procurement action.

2. Definitions

Procurement Lead Time. Elapsed time between the receipt of the requisition in the Procurement Office and the placement of the order. Ideally a procurement lead time of 60 to 90 days should be allowed for EPI procurements.

2.1 Production Lead Time. Elapsed time between the receipt of the order by the producer and the date of delivery. Production lead time for large volume vaccine procurements ranges from 6 to 8 weeks.

2.2 Shipping Time. Elapsed time between the date of shipment by the producer and date of arrival of the shipment at the consignee's airport.

2.3 World Market. Manufacturers or producers located in countries other than the requisitioning member country.

2.4 Local Market. Manufacturers or producers located in the requisitioning member country.

2.5 Requisitioner. The member country generating and submitting EPI vaccine requirements for procurement action.

2.6 Project Manager. The official responsible for the planning, organization, coordination, execution and evaluation of the EPI.

2.7 Maintenance of Value. Gains or losses incurred by the Revolving Fund (RF) as a result of local currency exchange transactions.

2.8 Planned Requirement A member country EPI vaccine requirement generated on the basis of anticipated need in accordance with established planning schedules.

2.9 Service Charge. A percentage applied to the net cost of vaccine purchased by the Procurement Office for EPI member countries.

2.10 Convertible Currency. Local currency readily convertible to U.S. dollars.

2.11 Procurement Office. PAHO Procurement Office (APC)

3. Discussion

3.1 The availability of an Expanded Program on Immunization (EPI)

Revolving Fund (RF) will make it possible for the PAHO to accept and take procurement action on unfunded requisitions from member countries. The Fund will finance purchase orders pending reimbursement by individual requisitioners thus permitting a vaccine procurement to go forward in an orderly manner without regard to temporary payment delays.

3.2 It is anticipated that countries will generate and submit vaccine requirements to PAHO in accordance with established EPI planning

schedules. Upon receipt of requirements from member country Project Managers, the PAHO Project Manager will consolidate them and convert them to ordering schedules for submission to the Procurement Office. The Procurement Office would issue contracts and purchase orders to meet scheduled needs.

3.3 It is assumed that member countries will budget for and fund EPI vaccine procurements. The EPI Revolving Fund will serve only as an interim measure to permit procurement on an orderly cyclical basis and not intermittently as funds actually become available to each member country.

3.4 It is also assumed that member countries will generate annual and quarterly vaccine orders calculated in terms of numbers of doses and doses per vial, in accordance with an established EPI planning schedule and that these orders or planned requirements will be reported to PAHO within prescribed time frames.

3.5 The PAHO will have to be staffed adequately to handle the planning and scheduling (CD), procurement and shipping (APO) and management of the RF and monitoring of local currency balances (AFI), related to the EPI. A Project Manager with a staff dedicated to the EPI should be established in each of these organizational units.

3.6 The key to good procurement support services will be adequate procurement lead time. If requirements are placed on the Procurement Office sufficiently in advance of the required delivery dates, and if the requirements are consolidated to permit volume buys, there will be good probability

of achieving economy of price, quality of product and timely shipment and delivery.

3.7 Considerable study should be applied to the question of whether procurements should be made on an annual, semi-annual or quarterly basis. There are certain difficulties with annual or term contracts. First of all, prices can seldom be held firm for a period of 12 months. Producers may be inclined to offer less than their most favorable prices because of the need to cover possible inflation and other contingencies. Secondly, some biologicals do not have maximum shelf life of 12 months after testing. Finally, changes to increase or decrease contract quantities may be hard to make without incurring additional contractual costs.

3.8 In order for the EPI procurement program to work, countries will have to develop the capability to plan requirements a year in advance of needs. Annual planned requirements will then have to be adjusted quarterly. The first quarter planned requirements will be considered to be firm requirements for ordering purposes. A continuous update procedure of developing planned requirements a year in advance with subsequent periodic adjustments will lead to an orderly and timely placement of orders throughout the year.

3.9 Vaccine producers will have to be selected from the world market. All qualified producers will be invited to bid based on firm specifications and required delivery dates. The basis of award will be price, quality of product and delivery terms.

4. Principles

4.1 Vaccine requirements will be planned in accordance with

EPI established schedules.

4.2 Vaccines will be purchased on a regular cyclical basis - preferably at quarterly intervals.

4.3 Vaccines will be purchased by competitive procurement on the basis of established specifications, quality control and testing standards, and delivery terms with award to the lowest responsive and responsible bidder.

4.4 The Procurement Office will advertise procurements on the world market, limited to from producers whose quality control procedures are acceptable to WHO/PAHO or whose protocols can be relied on.

4.5 Actual cost of transportation from manufacturers to country destination will be reimbursed by the requisitioner.

4.6 The RF shall be used as a "bridging fund" to permit the Procurement Office to place orders on the basis of unfunded requisitions with repayment to the RF to be made subsequently in accordance with established guidelines and procedures.

4.7 PAHO (AFI) shall accept local currency provided.

4.7.1 PAHO can spend the funds freely in the requisitioner country.

4.7.2 PAHO can convert the local currency to U.S. dollars.

4.8 A service charge will be applied to all RF funded procurements and retained as a reserve to cover losses that may arise in carrying out the EPI.

4.9 Countries which do not replenish the RF in accordance with the rules of the program will not be eligible for further use of the RF until they reimburse the fund.

4.10 There will be established for each member country a U.S. dollar level above which equivalent local currency reimbursements will not be accepted by quarters.

4.11 The RF will be financed by a portion of the PAHO Working Capital Fund set aside for this use. Since all RF funded purchase shall be reimbursable, the funds devoted to this purpose should not be depleted with the passage of time.

4.12 The purchasing power of the RF must be maintained at the established level. Therefore safeguards must be established to protect the fund against unrecoverable losses.

4.13 The RF will be established for an indefinite period of time.

4.14 If a country submits Purchase Authorizations for vaccines at intervals outside of the planning schedule the Procurement Office will make the procurement under the present regular procedures for reimbursable procurement.

4.15 The Procurement Office (APO) will serve as the ordering agent for the member countries requiring EPI procurement support.

4.16 Consolidated requirements in terms of firm ordering schedules shall be reported to the Procurement Office quarterly in sufficient time to allow 90 days procurement lead time and 60 days production lead time.

4.17 All vaccine procurements will be shipped by air. It will be the responsibility of the member country to arrange customs clearance.

5. Procedure

5.1 Member countries will determine annual and quarterly vaccine requirements calculated in terms of numbers of doses and doses per vial in accordance with established EPI planning schedules.

5.2 Member countries will adjust planned requirements quarterly so that the first quarter requirement will become the firm requirement to be placed on order.

5.3 Member countries will report firm first quarter requirements to PAHO headquarters in accordance with established procedures and time frames.

5.4 Upon receipt of these firm requirements the PAHO EPI Project Manager (CD) will consolidate them and prepare ordering schedules.

5.5 The PAHO EPI Project Manager (CD) will forward ordering schedules to the Procurement Office (APO) in accordance with prescribed time frames.

5.6 The Procurement Office (APO) will issue contracts and purchase orders in accordance with normal procurement policies and procedures. Prior to forwarding purchase orders to manufacturers, the Procurement Office will route the purchase order documents via AFI to establish obligations against the Revolving Fund.

5.7 At the time the obligation is posted to the Revolving Fund account copies of the purchase orders will be forwarded to the appropriate

Project Managers for information purposes.

5.8 Upon receipt of the producer's invoice supported by evidence of shipment, APO will process the invoice to AFI for payment.

5.9 AFI will pay the invoice and bill the member country for reimbursement in U.S. dollars or local currency at the rate of exchange effective as of the date of billing. Exchange losses if any will be charged to the reserve established from the service charges.

5.10 Member countries which do not reimburse the Revolving Fund within 60 days after billing will not be eligible for further procurement support under the EPI Program.

5.11 AFI will establish a reserve account to which all service charge receipts will be credited. Losses including losses from currency transactions will be charged against this account.

5.12 AFI will establish for each country a U.S. dollar level above which repayments to the Revolving Fund in equivalent local currency will not be accepted. These levels will be based on the predicted level of PAHO local currency expenditures in that country. Once a member country reaches this level it will become ineligible for procurement support through the Revolving Fund until such time as repayment is made in U.S. dollars or in convertible currency.

5.13 The Procurement Office (APO) shall apply a service charge of 3% to the net cost of the vaccine purchased under each order.

EXPANSION OF VACCINE PRODUCTION AND IMPROVED QUALITY CONTROL
IN THE AMERICAS

This narrative refers to the Latin American countries of the Region. Canada and United States of America are more or less self sufficient for all vaccines--at least at this time. These two countries serve as a resource to the rest of the Americas in terms of provision of vaccines and technology.

In Latin America there is now a nucleus for the production and control of biologicals. Twelve countries--Argentina, Bolivia, Brazil, Chile, Colombia, Cuba, Ecuador, Guatemala, Mexico, Peru, Uruguay, and Venezuela--have government-owned or -sponsored laboratories which either produce, or are in various stages in the development of production, of DPT vaccines. All of these countries have BCG vaccine production. The capability for producing poliomyelitis and measles vaccines is being developed in two countries--Brazil and Mexico. These are the six basic vaccines which are emphasized in the Expanded Program for Immunization (EPI). None of these countries, however, produce enough to satisfy its own needs for these vaccines. The Region has therefore to rely heavily for its requirements on imports from Canada, Europe, and the United States. It is perfectly clear that for early progress in the EPI, vaccines will have to be purchased in relatively large quantities.

The conditions and capability for the production and control of the DPT and BCG vaccines in Latin America ranges from excellent to extremely poor. Progress in improving quality and expanding production has been positive, but very slow. Most of the countries listed above have the basic technology and skeletal knowledgeable scientific staff. There is every reason to believe that, given sufficient financial backing and proper advisory technical assistance, all of these government laboratories could, within a period of ten years, not only meet their own countries' needs, but combined they should have sufficient surplus to meet the needs of other countries in this Region.

In Latin America the weakest link in biologics production lies in poor quality control. Of the countries noted above, Mexico is the only country with satisfactory in-process and national controls. Argentina has the nucleus of an effective national biologics control laboratory, but at present the in-process and internal controls are at an unacceptable level. Any program for improving production will, of necessity, depend on first developing suitable control laboratories.

The next weakest link lies in insufficient and at times poorly-designed aseptic filling (of vaccine into vials) techniques. At present it is possible to purchase concentrate DPT adjuvant vaccines for as low as three cents (US) a dose. It is, however, questionable whether any of the producing laboratories have sufficient aseptic filling capability to handle the concentrated bulk that would be required for this Region.

The modernization and development of up-to-date production techniques could be proceeded simultaneously with the above, or shortly thereafter. As noted previously progress in all of these areas will depend on the available financial and technical support.

Following is a brief summary of the producing government laboratories, indicating where improvement is required:

Argentina has two producing laboratories: the Instituto Nacional de Microbiología "Carlos Malbran" and Instituto Biológico y Laboratorios de Salud Pública in La Plata. The Malbran Institute has fallen into a state of acute disrepair and will require extensive modernization. Technological assistance will also be required in bringing production technique up to date. Their in-process controls are inadequate and they do not possess internal controls. Their aseptic filling is also inadequate and poorly done. The Instituto Biológico is now in the process of renovation. We (CEPANZO) gave some advice on the building plans which are excellent. Their internal biologics control unit will need strengthening. The country has the nucleus of a very effective national biologics control laboratory which will need expanded facilities.

Bolivia has an agreement with Institute Pasteur, which assisted them in the construction of a public health laboratory building, a part of which houses vaccine production and finishing. Concentrate bulk DPT is provided by the Institut Pasteur at three cents (US) a dose. The aseptic filling capacity is limited. They do not have a national biologics control laboratory although embryonic plans are under consideration.

Brazil has at least four government laboratories with reasonable capability for both production and control. Its national biologics control laboratory is being developed but progress has been disappointingly slow.

Colombia has one of the highest production capabilities in Latin America. Their procedure for filling is most interesting. They use a soft plastic container, which to date has not been subjected to adequate testing for stability of the vaccines, safety of the plastic, and final sterility of the container. Until these tests have been satisfactorily carried out PAHO will not be in a position to recommend this technique. In-process controls seem adequate but they have no meaningful internal or national biologics control laboratory.

Cuba is still in the developmental stage and is supported by UNDP funding.

Ecuador has shown high capability for producing good vaccines. The volume of production is limited, however, and should be expanded. They have good technical expertise. The country lacks both internal controls and an effective national biologics control laboratory.

Guatemala produces DP vaccines and imports tetanus toxoid. Their end products have tested excellent, but production facilities at best are from poor to hazardous. The country has a limited number of scientists properly trained in biologic production. Entirely new laboratory facilities are required. The laboratory does not exercise internal controls, nor does the country have a national biologics control laboratory.

Mexico has a high capability in bacterial vaccine production and control. The controls are adequate at all levels--in-process, internal, and national. The national laboratory could function as a PAHO reference test center. At the moment production is inadequate for Mexico's own needs. They will have to be expanded.

Uruguay produces DPT vaccine under entirely unacceptable conditions. New laboratories will be required. Both internal and national controls will have to be established. Present production capability is low.

Venezuela has a good but limited vaccine production capability. They have no internal controls, and the national control laboratory is more or less still on paper and has to be developed.

Concerning polio vaccines, Mexico is the only country developing production and control capability. The Instituto Nacional de Virología has demonstrated capability of producing this vaccine by conventional procedures. Unfortunately they switched to a procedure which is still in the developmental stage, and to date have not succeeded in producing a single batch. We have suggested that they revert to the conventional procedures, until the developmental methods have been proven. Their national biologics control laboratory for viral vaccines is in the embryonic state.

Brazil (Brasilvac) has an arrangement with the Connaught Laboratories Limited (CLL) whereby the CLL provides concentrate bulk and know-how for finishing. To date this has not been very productive.

Mensles vaccine has been produced in Mexico but difficulties were encountered and this is now in abeyance. The possibility of assistance from a producing laboratory, such as CLL or the Institut Armande Frappier (IAF), both of which have developed their own attenuated strains and completed successful preliminary field trials, should be investigated.

Assistance from the IAF would be available for Brazil as well.

Yellow fever vaccine, while not included in WHO's list of six essential vaccines, is of particular concern in the Americas. Both Colombia and Brazil have producing laboratories. Extra financial aid may have to be found to ensure adequate supplies for the Region.

The above is a brief review of the status of essential vaccine production in Latin America. In the outline for each country, problem areas have been identified. Projects to overcome these problems could readily be developed depending on adequate funding and technical support. If attacked vigorously the Americas could become self sufficient by 1987.

EXPANSION OF IMMUNIZATION ACTIVITIES WITHIN
MATERNAL AND CHILD HEALTH CARE PROGRAMS *

1. Extent of the Problem

Maternal and child health problems are usually serious ones. They affect definite age groups which account for approximately 63% of the population of Latin America and the Caribbean.

This problem is basically the result of socio-economic and cultural underdevelopment, rapid population increase and the consequent difficulty of being able to provide suitable social services, including health services.

Children need suitable protection from dangers in their family and community environments, especially during early stages of growth and development.

Special emphasis should be given to the importance that many countries of the Region attribute to preventing important health dangers which are affected by infectious and parasitic diseases. At the beginning of the decade, these diseases were responsible for more than 30% of the deaths occurring in children under five years of age. In the Inter-American Investigation of Infant and Child Mortality, malnutrition, which was recorded in 34.1% of all deaths, was present in conjunction with infectious diseases in 60.9% of the deaths. This illustrates the synergism of the two diseases and, from a practical viewpoint, presents the need for establishing a cooperative program basis for the control of these two diseases in children.

Although modern science does not offer a simple means for controlling morbidity and mortality caused by some of the infectious diseases that contribute

* Dr. Jorge Rosselot Vicuna
Regional Advisor in Maternal and Child Health
Family Health Division

to an increase in infant deaths, such as enteric and respiratory diseases, there seems to be sufficient evidence that the situation is different for infectious diseases that can be prevented through efficient vaccines. This requires that relevant activities currently under way and the anticipated expansion of these activities be rationally planned and implemented and that attempts be made to achieve the most favorable cost-benefits ratio. This requires, among other measures, the promotion of permanent coordination with related activities in the maternal and child programs.

The afore mentioned Inter-American Investigation of Mortality revealed that 13.3% of infant deaths are caused by diseases for which a vaccination exists, especially measles. Following this line of thought, then, if this situation had not changed significantly in the last few years, mortality among children under five years of age could be reduced by approximately 10% if, during this period of their life, vaccination programs are carried out which are more effective than those implemented in the past.

Likewise, in many Latin American and Caribbean countries, diseases which can be prevented through vaccination are one of the five leading causes of death among infants and children. This is especially true during the first year of life with respect to the following diseases: tetanus (7 countries), measles (3 countries) and whooping cough (3 countries). In children between 1 and 4 years of age, the 5 leading causes of death include measles (11 countries) and whooping cough (7 countries). Finally, the above-mentioned studies have made it possible to prove that coverage of immunization programs for children who died from these diseases had generally been limited. Coverage varied from 0.7% to 36.1% for measles; from 5.3% to 67.5% for diphtheria; from 2.1% to 84.9% for polio and from 5.1% to 52% for tetanus.

On the other hand, the immunization goals which have been achieved are not necessarily a guarantee that such cases have reached a satisfactory level of immunization, since it is very possible that often a sufficient concentration of these activities has not been reached. It can also be assumed that the common link with malnutrition may have contributed to the unfavorable response to immunization.

In short, it seems that one of the highest priorities in designing a coordinated program for expanded immunization is that of improving statistical information and epidemiological knowledge of infectious diseases, especially those diseases which can be prevented through immunization, chiefly of children. Likewise, a dynamic outlook is necessary in so far as progress in coverage of different immunization programs is concerned.

2. Conceptual Bases of Coordination

There is general agreement that the immunization activities described above should take place within general health services, preferably in close cooperation with the development of maternal and child health programs. This is advisable because, among other reasons, the specific beneficiaries of such health programs are usually the targets of most immunization programs. This approach should, when established in such a manner, strive for fruitful results that avoid duplication of activities and increase the efficiency of the activities by allowing simultaneous control of other related morbid states which affect children and which are common in most of the Latin American and Caribbean countries. This is especially true for the sectors which are biologically and socio-economically most vulnerable.

The entire process is facilitated when all opportunities for contact between mothers and children and the maternal and child health services are utilized. This wisely includes opportunities arising from hospital discharges or periods of convalescence for different morbid conditions in general. In these cases, the beneficial impact of education should always be an important factor.

Generally, in those countries in which simple but effective systems for supervision of growth and development have been developed, the above mentioned coordination is facilitated and becomes an operational method which can be used creatively in family health primary care systems in marginal areas, especially rural areas. This course of action, which is supported by WHO and more recently by UNICEF, is being satisfactorily applied in the Region of the Americas for providing basic services for children in developing countries. The operational scope of this program should be progressively expanded.

Obviously, in some areas the total lack of health services results in exceptional situations, especially with the appearance of actual or potential epidemic outbreaks, which make it necessary to implement vertical-type activities. In all cases, these activities should be strictly temporary. The final result is the creation at a reasonable cost of minimum health units through which immunization activities can be carried out. These activities are further strengthened by encouraging coordination with the informal health system.

When such coordination is implemented, the valuable intellectual stimulus which professionals and officials in maternal and child health programs will unquestionably provide by actually participating in immunization activities should be considered an unexpected and favorable contribution. Their motivation

force as an indispensable technical influence affecting mothers, children and families should also be extremely important.

Last, but not least, this integration must make it possible for the entire program of expansion to eventually have access to additional resources provided by international cooperation in many Latin American and Caribbean countries, in the subregions and/or in the entire Region, as well as those resources which are now used to aid various maternal and child health and family health programs.

3. Coordination Activities and the Strategy for Implementing them

The coordination activities described below should be implemented simultaneously on the different operational levels of PAHO. Technical cooperation in this field for countries in the Region should progressively transform the appropriate recommended strategy, either through specific national activities during their customary expansion and/or through appropriate projects for cooperation functioning on the country level, or on the sub-regional or regional levels.

In order to achieve this goal it is necessary to continue to strengthen the processes considered for existing and future inter-divisional coordination, as recently established as headquarters. This is particularly true for Disease Control and Family Health Divisions especially in their relation to the Program for Coordinated Expansion of Immunization. A similar approach should be slowly implemented in the Area Offices and the Country Representation Offices with the participation of appropriate professionals.

Among other activities which should be considered in implementing this coordination are the following:

a) To carry out a joint effort for improving information on the current extent of health risks from infectious diseases for which vaccinations exist, especially those diseases affecting infants and children, and to encourage more appropriate epidemiological interpretation of these diseases. Similar activities should be carried out regularly concerning the need for up-to-date information on the coverage achieved in immunization programs in so far as each type of vaccine, the number of doses used and the age groups benefitting from these immunizations. Sample studies could be useful in gathering this information.

b) To define the general structure which will make it possible to establish processes for coordination on different levels of expanded immunization activities within the maternal and child health and family health programs as the basis for completing a multidisciplinary project. This should later be changed into a process for the implementation of programs, supervision and continuing training of professionals and officials involved in the program.

c) To design the technical and administrative operational basis that will allow for gradual expansion of immunization activities bearing in mind coverage goals and concentration standards which are, whenever feasible, consistent with the goals of maternal and child health care programs. This goal should include reaching an average of 60% of the appropriate age groups by the end of the decade.

d) To agree on an Immunization Calendar based on a common plan but with a certain degree of flexibility which considers, among other factors,

the age of the beneficiary (gestation period for tetanus vaccine and newborns for BCG vaccination), place (preference given to permanent maternal and child health clinics), techniques (advantages of simultaneous immunization) and type of personnel participating in the program (maximum delegation of authority in questions concerning operational decisions, including proper supervision).

e) To jointly analyze informational and educational material in cooperation with the appropriate technicians, bearing in mind the relevant socio-cultural and anthropological characteristics of each environment and with a constant awareness of the need to consider the motivation which may be obtained.

f) To implement a decisive effort for encouraging community participation in each stage of the program. As experience in this respect in the countries of the Region has demonstrated, it is essential that such participation be characterized by a reasonable degree of institutionalization and the greatest possible decentralization (section or neighborhood brigades). It is essential to establish such units in periurban and rural areas where health problems are grater and available resources are more limited.

g) To encourage basic and operational research which makes it possible to obtain information not yet available and which deals basically with epidemiological aspects of common interest for the effective development of immunization and maternal and child health and family health activities.

h) To establish a means for permanent evaluation of immunization expansion activities which are integrated into the maternal and child health program by establishing appropriate indicators which are easy to manage and to interpret in order to be able to make the necessary operational adjustments at the right time.

4. List of Projects in Maternal and Child Health and Family Health which can be increased or strengthened through the Development of Coordinated Immunization Expansion Activities.

Under the general technical guidance of the Family Health Division, 29 projects in the field of maternal and child health and population dynamics (list attached) are in operation in the Region at the present time. Of these, 19 are being developed on the country level and the remainder (10) are either sub-regional or regional. This list of projects includes those of the three multinational centers (INCAP, CFNI and CLAP) which are part of the Family Health Division and which are in some way expanding their activities into the field of maternal and child health and family health. Many of these projects receive support from different international agencies, especially UNFPA, UNICEF, the Kellogg Foundation and AID.

It is too early for this paper to explore the methods which can be used to assure that the resources considered for these projects can be used as a basis for strengthening the projects and at the same time contribute to the effective development of an expanded immunization program.

We believe that before this can happen, this task requires special motivation, especially on the level of Area Representation and Country Representation. It is evident that in the future similar activities should be developed in conjunction with appropriate government authorities.

We feel that the general line of coordination described here should give priority to activities for improving available statistical information, training personnel (fellowships, local courses), and for exchanging experiences (national, sub-regional and regional seminars) as well as other activities.

Priority should also be given to educational activities and activities for dissemination of bibliographic materials, preferably in cooperation with other institutions. Lastly, we feel that the intellectual stimulus resulting from the completion of the activities described here will help to attract the support of important scientific societies that work with Maternal and Child Health and Family Health Programs and are usually highly regarded in the countries of the Region.

All innovations concerning the establishment and implementation of activities in existing maternal and child health services will require a reasonable period, which will vary from country to country, to gradually achieve the integration described in this paper. These activities should include immunization to a much greater degree than in the past. This integration should obviously operate within general health service, particularly those in rural areas, and should bear in mind the special characteristics of the primary health care systems for families which are to be established.

LIST OF PROJECTS IN MATERNAL AND CHILD HEALTH, FAMILY HEALTH
AND POPULATION DYNAMICS IN THE AMERICAS, 1977

<u>Code</u>	<u>Title</u>	<u>Interagency Cooperation</u>
Argentina-1301	Maternal and Child Health	
Bolivia 1300	Maternal and Child Health	+
Brazil 1301	Maternal and Child Health	
Colombia 1300	Maternal and Child Health and Family Welfare	
Chile 1302	Extension of Maternal and Child Health and Family Welfare Services	+
Chile 1303	Clinical and Social Pediatrics Courses	
Cuba 1300	Maternal and Child Health and Popula- tion Dynamics	+
Ecuador 1300	Family Planning and Maternity Hospital Care	+
Guatemala 1301	Maternal and Child Health	
Haiti 1300	Family Health and Population Dynamics	+
Mexico 1300	Family Health and Population Dynamics	+
Panama 1301	Maternal and Child and Family Health	
Paraguay 1300	Maternal and Child Health	+
Uruguay 1300	Maternal and Child Health	
Venezuela 1300	Family Health	
W. Indies 1301 (St.Kitts/Nevis)	Family Planning	+
W. Indies 1302 (St.Vincent)	Health and Population Dynamics	+
W. Indies 1304 (Dominica)	Family Planning Program	+
W. Indies 1304 (Caymans)	Maternal and Child Health	+
AMRO- 1300	Family Health and Population Dynamics (HQ)	+
AMRO 1310	Family Health and Population Dynamics (Area I)	+
AMRO 1320	Family Health and Population Dynamics (Area II)	+
AMRO 1330	Family Health and Population Dynamics (Area III)	+
AMRO 1331	Training in Maternal and Child Health in Rural Areas (Area III)	+
AMRO 1360	Maternal and Child Health (Area VI)	
AMRO 1370	Latin American Center for Perinatology (Regional)	
AMRO 1373	Development of Maternal and Child Health Programs (Regional)	+
AMRO 1411	Caribbean Food and Nutrition Institute (Subregional)	+
AMRO 1430	Institute of Nutrition of Central America and Panama (Subregional)	+

Project and Allotment List.

Pan American Health Organization, January 1977.

THE ROLE OF PAHO REFERENCE LABORATORIES IN THE EPI

The success or failure of immunization campaigns--once the mechanics of handling and administration has been firmly established--will depend on the availability of adequate amounts of safe and fully effective vaccines. In the developing countries, where the needs are greatest, the capability of producing and controlling these vaccines is generally entirely lacking and at best is inadequate. The program thus, in its early stages at least, will be dependent on imports produced and controlled in more developed countries. This situation will, of course, apply to the majority of the countries of the American Region.

The six diseases to be covered in the EPI (WHO) includes diphtheria, pertussis, tetanus, tuberculosis, poliomyelitis, and measles. At present Canada and the United States are more or less self-sufficient in vaccines for all of the above and are in a position to serve as a resource to the rest of the Americas in terms of provision of vaccines and technology.

In Latin America there is now a nucleus for the production and control of biologicals. Twelve countries--Argentina, Bolivia, Brazil, Chile, Colombia, Cuba, Ecuador, Guatemala, Mexico, Peru, Uruguay, and Venezuela--have government-owned or -sponsored laboratories which either produce, or are in various stages in the development of production, of DPT vaccines. All of these countries have BCG vaccine production. The capability for producing poliomyelitis and measles vaccines is being developed in two countries--Brazil and Mexico. None of these countries,

at present, produce enough for their own use so that the Region will have to rely heavily for its requirements on imports. Whether imported or produced domestically, however, it is most important that the quality of vaccine--i.e., safety, potency, and stability under conditions of use--be of a high order. To ensure this it would be helpful to periodically collect samples of vaccines which have been kept under varying conditions in the field and have them tested for potency. The extent to which this will be possible will be dependent on the availability of funds to pay for such testing. This does not present a problem so far as BCG vaccine is concerned, for all tests pertaining to it can be handled efficiently by PAHO/WHO Reference Laboratories--i.e., CEPANZO in Buenos Aires, and the WHO Reference BCG Laboratory in Copenhagen. So far as the other five vaccines are concerned, a limited number of samples can be tested free of charge by the Bureau of Biologics (BOB) of the United States. The number of such free tests, however, will of necessity be limited, and also the results may be delayed due to the pressures of the normal heavy volume of testing at the BOB.

Additionally at this time PAHO has under consideration plans for a Biologics Reference Center for Latin America for training in production and control, to be located in Mexico. This center, if established, could also test a reasonable number of samples--i.e., between 10 and 20 of each product per year. The cost of establishing and operating this has been estimated as \$135,000 spread over a

three-year period. It should be pointed out, however, that the main purpose of that project would be training in production and control; the testing of samples would be a fringe benefit.

Additional samples for test would, of necessity, have to be done on a contract/cost basis. We have accordingly approached three PAHO Reference Laboratories: two in Canada--Institut Armande Frappier (IAF) and Connaught Laboratories Limited (CLL); and one in the United States--Michigan State Laboratories (MSL) for cost estimates for testing. Estimates have been received from the MSL and IAF and these ... are attached.

Estimates from the CLL have not been received as yet. The Massachusetts State Laboratories have indicated they are not in a position to do any testing for us.

... Attachment

COST OF TESTING VACCINES

Institut Armande Frappier:

Potency tests only:

Pertussis:

For first lot \$550

For every extra one tested at the same time \$100

Complete diphtheria and Pertussis (US test) \$325

If four lots of DPT tested at a time \$2160

Polio vaccine (Sabin), per lot (total count only) \$60

Measles, per lot \$50

Michigan State Laboratories:

DPT (potency tests), per lot (Minimum of two lots) \$850

CONNAUGHT LABORATORIES LIMITED
1755 Steeles Avenue West
Willowdale
Ontario, Canada M2N 5T8

PAN AMERICAN HEALTH ORGANIZATION

Testing of Toxoids & Vaccines

(8000151)

	<u>Suggested 1977 Price</u>	
Diphtheria Toxoid Potency Test	\$ 535.00	} 1530
Tetanus Toxoid Potency Test	535.00	
Pertussis Vaccine Potency Test	460.00	
Safety/Antigenicity Test for DPT & Components	350.00	
Complete Set of Tests (As Above) for DPT Vaccine	\$1,880.00	
Typhoid Vaccine Potency Test	420.00	
<u>Special Tests</u>		
Aluminum Content	\$ 149.00	
Preservative Test Modified	112.00	
Preservative Test Regular	78.00	
Nitrogen Test	149.00	
Opacity Test	12.00	
Flocculation Test	29.00	

Retests

Retests are priced at 50% of above rates.

H. Mitchell

PAHO EXECUTIVE COMMITTEE MEMBERS STUDY GROUP ON THE EXPANDED
PROGRAM ON IMMUNIZATION (EPI) IN THE AMERICAS

At the request of the Director, a PAHO Executive Committee Members Study Group on the Expanded Immunization Program for the Americas met in Washington, D.C., on the 15th of April, 1977.

The objectives of the Study Group were:

- 1) To review the PAHO Immunization Task Force background documents of the proposal for EPI in the Americas.
- 2) To develop policy recommendations for the Director for the implementation of EPI in the Americas.

LIST OF PARTICIPANTS

A. Executive Committee Members:

Dr. Gustavo Mora
Chief, International Relations
Ministry of Public Health
Bogotá, Colombia

Dr. Rodrigo Jiménez Monge
Ministry of Public Health
San José, Costa Rica

Dr. Richard Uhrich
Associate Director
Office of International Health
Washington, D.C.

Dr. Roderick Doug Deen
Ministry of Health
Port of Spain, Trinidad

B. PAHO Staff:

Dr. Pedro N. Acha	Chief, Division of Disease Control
Dr. Karl A. Western	Chief, Communicable Diseases

Dr. Jorge Rosselot	Regional Advisor, Maternal and Child Care
Dr. Louis Greenberg	Chief, Laboratory Services
Dr. Nilo Vallejo	Regional Advisor, Health Education
Dr. Fortunato Vargas Tentori	Medical Officer, Health Services
Dr. James H. Rust	Surveillance Officer, Communicable Diseases
Mr. William Umstead	Chief, Procurement Office
Dr. Ciro A. de Quadros	Advisor in Immunization, Communicable Diseases

RECOMMENDATIONS OF THE PAHO EXECUTIVE COMMITTEE STUDY GROUP
ON THE EXPANDED PROGRAM ON IMMUNIZATION FOR THE AMERICAS

The Study Group, which met in Washington, D.C. on the 15th of April, 1977, after reviewing the background documents prepared by the PAHO Immunization Task Force, recommends to the Director the following general policies and strategies for his consideration:

1. The Expanded Program on Immunization for the Americas should be available to all Member Countries with a national will and a determined policy to strengthen and improve the delivery of immunization services within existing or proposed health structures. The Study Group furthermore considers the designation of a national immunization program manager as essential.
2. PAHO technical cooperation should supplement and not be a substitute for the national effort.
3. Additional financial support from PAHO and other agencies is less important than assisting countries to utilize better existing resources by supporting the development of their national planning, management capacity, multidisciplinary training and operational capability in immunization services.
4. PAHO should proceed with implementing the Executive Committee Resolution CE-74.R9, particularly in reference to a comprehensive country by country analysis of the present immunization status, in order to identify areas in which assistance by the Organization and/or other technical agencies may be required.
5. Operational research should be encouraged to improve vaccines, vaccine preservation (cold chain), immunization surveillance, training and delivery of immunization services through primary health care.
6. Maximum effort should be made to strengthen the immunization component of existing PAHO Family Health and Primary Health Care projects.
7. The Study Group considered that the proposal for the establishment of the Rotating Fund for purchase of vaccine should be approved and presented to the Member Countries to determine which countries will be interested in its utilization. It is also suggested that the Rotating Fund be made available for purchase of equipment and other materials required to successfully conduct an immunization program.
8. The Study Group endorses the Organization's efforts to promote vaccine production and quality control (Annex I).

9. Finally, the Study Group recommends that the proposal for the Expanded Program on Immunization for the Americas be included in the Agenda of the Executive Committee Meeting, with an outline of the budgetary implications for the proposed program.

QUALITY CONTROL AND PRODUCTION OF BIOLOGICALS

The authority for PAHO's activity related to production and quality control of biologicals is clearly outlined in the Ten-Year Health Plan for the Americas, page 67, recommendations 2 and 4c, which state:

Recommendation 2: "Expand and improve laboratories that manufacture biological products for human and veterinary use designed for diagnosis, prevention, and treatment of infectious diseases, in order to satisfy, in particular, the present and future national and multinational demand of programs for control of measles, whooping cough, tetanus, diphtheria, poliomyelitis and smallpox."

Recommendation 4c: "Consolidate and expand facilities for the preparation and control of biological products for human and veterinary use, intended for diagnosis, prevention and treatment of infectious diseases."

The six diseases specifically referred to in Recommendation 2 contain five of the diseases being dealt with in the Expanded Program on Immunization. Smallpox which is included in the Recommendation is now on the verge of eradication and no longer applies. Tuberculosis which is not included in the recommendations is a component of the EPI and should therefore be added to the list.

While there is a capability for the production of DPT, BCG, Poliomyelitis and measles vaccine in a number of countries in this Region, except for Canada and the USA none are self-sufficient in the production of any of these vaccines other than BCG. The EPI will thus have to depend heavily on imports for at least another 5 to 10 years.

To hasten self-sufficiency in the Region, PAHO's programs have been designed to increase the capability in the control of all biologicals at the national level. In this regard the Organization is working with the Mexican authorities towards the establishment of a Reference Laboratory for the production and quality control of vaccines. While the emphasis will be placed on the viral vaccines, the bacterial vaccines will be included. Plans include the establishment of at least another Reference Laboratory in another country. Both Laboratories should function as training centers as well as provide reference testing services. In these projects the budget will provide for the training of personnel, through fellowships and short-term consultantships.

With the expected increase in the need for testing samples of vaccine collected from the field as well as at the production level, consideration should be given to the establishment of a Fund in order to contract testing services at other laboratories at least for the next two years.

It is suggested that the sum of \$11,000 per year be set aside for this purpose. This sum would provide for the testing of 25 lots each of poliomyelitis and measles vaccines and 10 lots of DPT. This initial allocation should be reviewed annually.

As part of its routine functions, PAHO assists Government Laboratories in obtaining satisfactory production strains for vaccine manufacture, and provides manuals for production and control procedures.

Laboratories undertaking vaccine manufacture should include in their overall plans provision for the ultimate establishment of a Research and Development Division.