EPI Newsletter

Expanded Program on Immunization in the Americas

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Caribbean Countries Set 1985 EPI Targets at Trinidad Meeting

The EPI program managers for the English-speaking Caribbean and Suriname held their second regional meeting from 21 to 25 November 1983 in Trinidad, two years after the first regional meeting in Kingston, Jamaica.[1] Twenty-two representatives from seventeen countries and territories attended the meeting, which was hosted by the Caribbean Epidemiology Center (CAREC) in Port of Spain.

The primary objectives of the meeting were to set each country's 1985 targets for immunization coverage and disease reduction, and to analyze the strategies and activities designed to achieve those targets, as outlined in the national 1984-85 work plans. These work plans are an important step towards the implementation of Resolution XVI of PAHO's 29th Directing Council which recognizes that accelerated progress will be necessary to achieve the 1990 EPI goals, and urges countries to set biennial targets for immunization coverage and for the reduction of the morbidity and mortality of the EPI diseases.[2]

Four technical presentations were also given at the meeting to update participants on specific issues related to immunization.

Organization and Methodology

The participants were divided into four small working groups which met for six hours a day to review progress made and problems encountered over the previous two years, and to present the 1984-85 work plans. Each day one country in the group gave a presentation including general background information on the EPI, the current status of the program, and the proposed targets and activities over the next two years, as outlined in the 1984-85 work plans. In most cases, these plans had already been prepared in draft form prior to the meeting. Following the presentation, the other members of the group acted as technical advisers to analyze the work plan under consideration, recommend possible new activities or strategies, and discuss the proposed 1985 coverage and disease reduction targets. Each country then prepared a final work plan incorporating those changes deemed to be appropriate and feasible.

In addition, all participants met in a plenary session each morning for presentation of a technical topic followed by a question and answer period. The four subjects covered were: the optimal age for measles immunization, a review of regional cold chain activities and work being

Caribbean EPI Managers discuss their work plans at Trinidad meeting *(Photo: K. Fitch, PAHO)*

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[1] See *EPI Newsletter* III-4 (August 1981).
[2] See *EPI Newsletter* V-5 (October 1983).

carried out at the Cold Chain Testing Center in Cali, Colombia; contraindications to immunization, and EPI reporting systems in the Caribbean.

On the last day of the meeting, each of the four working groups presented a consolidated report covering the general problems, achievements and targets of each country represented in the group.

Summary of Work Plans

Although the 19 countries comprising the Caribbean subregion vary widely in terms of size, population and resources, a number of common problems emerged during the group discussions. It was found that accurate data on the under-1 target population were frequently not available, making it difficult to calculate precise coverage percentages. Some of the smaller islands have merely to fine-tune their figures to take into account migrant populations, but many of the larger countries have more complex problems in calculating their target populations. Among activities planned in this area are better definition of each health center's catchment area, and the use of sample surveys to determine the size of target populations. Concentrated "mini-mass" campaigns are being planned by some countries to improve coverage in areas where it is found to be particularly low.

Several countries listed problems related to late or inadequate reporting of immunizations given, and stressed the need for standard formats for data collection and feedback to health staff of national data. The lack of reporting from private practitioners was also frequently mentioned as a problem in calculating accurate coverage figures. Some countries propose to offer free vaccines to private physicians, hold discussions with national medical associations, and/or develop a standardized reporting form in an attempt to remedy this problem.

Dropout rates, while considerably lower than in 1980, remain a significant obstacle to the achievement of coverage targets. The average dropout rate between the first and third doses of DPT and polio vaccine decreased from 40 percent in 1980 to 25 percent by the end of 1982, but more than half of the country work plans reviewed at the meeting specifically referred to the problem of identifying and following up defaulters. To combat this problem, some countries plan improved administrative procedures for early detection of dropouts, increased home visits, and more frequent monitoring of dropout percentages. Many countries plan community education activities using the mass media in order to make the public more aware of the importance of the EPI vaccines and the need to complete the recommended immunization schedule.

A number of countries mentioned the lack of resources—both physical and human—as an obstacle to full implementation of program activities. Five countries mentioned the problem of inadequate transportation for health workers, and included items relating to the purchase or loan of vehicles in their work plans, while three countries have plans to recruit additional health staff. Most country plans, however, seem to reflect a belief that making more effective use of available resources is the most realistic path to program improvement.

Almost one-third of the countries represented at the meeting mentioned the need for improved supervision. Activities planned in this regard include more frequent scheduling of supervisory visits over the next two years, and the development of guidelines to assure the visits will be conducted more uniformly and effectively.

In the area of training, seven countries have programmed activities related to community education and participation, and six have scheduled more EPI workshops. Two countries also have specific plans to introduce the EPI modules into the curricula of their Schools of Nursing and/or Medicine. Several countries have also scheduled in-service education activities.

Most countries at the meeting specifically mentioned cold chain activities in their work plans. Seven countries have plans to purchase more refrigeration equipment, and four have programmed training activities in the area of refrigerator maintenance and repair. Other activities mentioned include the use of standby generators in the event of power outages, more frequent recording of refrigerator temperatures, and implementation of a system to assure proper rotation of vaccine stocks.

In general, countries did not find it necessary to set specific disease-reduction targets, in view of the relatively low number of cases of the EPI diseases over the past two years. Rather, most countries aim to try to maintain the low levels of incidence already achieved. Two countries, however, have targeted a 50 percent reduction in measles cases, and two of the smaller island nations aim to eliminate the occurrence of all the EPI diseases by the end of 1985.

1985 Targets

At the final session of the meeting a summary table was presented of each country's 1985 coverage targets for complete immunization of children under 1 year of age with DPT, polio, BCG and measles vaccines. These figures are shown in Table 1, together with the reported 1982 coverages.

Since 1980, all 19 countries served by CAREC have been submitting immunization coverage reports. All 19 countries routinely administer DPT and polio vaccine, with most countries reporting coverages in the 60-90 percent range.

BCG and measles immunizations have been introduced more recently in most national programs; by the end of 1982, ten countries were administering BCG and sixteen were giving measles vaccine. Coverages with these vac-

TABLE 1. 1985 immunization coverage targets and 1982 reported coverages (%) in children less than 1 year of age, Caribbean countries

Country	Immunization coverage (%)							
	DPT		Polio		Measles		BCG	
	1982	1985	1982	1985	1982	1985	1982	1985
Anguilla	89	95	86	95	72	95	65	95
Antigua and Barbuda	79	90	86	90	(a)	(b)	(a)	(b)
Bahamas	69	80	67	80	65	80	(a)	(b)
Barbados	62	75	63	75	53	65	(c)	(b)
Belize	50	60	52	60	43	50	75	75
Bermuda	53	(b,d)	53	(b,d)	60(e)	(b,d)	(a)	(b,d)
British Virgin Islands	83	95	94	95	86	95	(a)	(b)
Cayman Islands	90	95	91	95	98(e,f)	95(e,f)	68	95(g)
Dominica	100	(b)	73	(b)	43	(b)	48	(b)
Grenada	56	85	61	85	5	80	(a)	(b)
Guyana	53	75	73	75	68(g)	85(g)	78	85
Jamaica	34	65	72(h)	70	12	60	27	70
Montserrat	94	94	86	86	51(e)	51(e)	66	99(i)
Saint Lucia	79	100	81	100	43	(b)	60	(b)
St. Kitts-Nevis	92	>90	93	>90	(a)	80	(a)	75(j)
St. Vincent and the Grenadines	67	95	99	>90	40	75(j)	(a)	85
Suriname	61	90	58	90	17(k)	90(l)	(a)	(b)
Trinidad and Tobago	54	80	59	80	(a)	(b)	(a)	(b)
Turks and Caicos Islands	67	(b,d)	80	(b,d)	6	(b,d)	50	(b,d)

(a) Vaccine not included in national program in 1982.
(b) Immunization coverage target for 1985 not established.
(c) >5 years
(d) Did not attend Trinidad meeting.
(e) MMR vaccine used
(f) <15 months
(g) 1 year
(h) Attained by mass campaign following polio epidemic.
(i) 0-5 years
(j) <2 years
(k) 12-35 months
(l) 1-3 years

cines tend to be lower, ranging from 27 to 78 percent for BCG and from 5 to 98 percent for measles immunization in 1982.[3]

Immunization coverage has generally improved between 1980 and 1983, particularly in the 12 smaller countries of the subregion with populations of less than 130,000 (in order of ascending population size: Anguilla, Turks and Caicos Islands, British Virgin Islands, Montserrat, Cayman Islands, St. Kitts/Nevis, Bermuda, Antigua and Barbuda, Dominica, Grenada, St. Vincent and the Grenadines, and Saint Lucia). The seven larger countries (Belize, Bahamas, Barbados, Suriname, Guyana, Trinidad and Tobago, and Jamaica) have also improved their coverages, but none has yet reached levels greater than 80 percent with any vaccine.

If all countries meet their 1985 targets, immunization coverages for DPT and polio will range from 60 to 100 percent, with most countries attaining coverages of over 80 percent. For measles, 1985 targets range from 50 to 95 percent coverage, and for BCG, from 70 to 99 percent.

Editorial note: Most countries of the English-speaking Carribean are well on their way to achieving their immunization coverage targets. Another meeting of Caribbean EPI Managers is planned for the beginning of 1986, at which time progress made in achieving the 1985 targets will be evaluated and new ones will be set. It is hoped that these periodic meetings will continue to give immunization managers an opportunity to learn from and motivate each other by sharing knowledge and experiences, bringing each country closer to the 1990 goal of making immunization services available to 100 percent of their target populations.

[3] See "Country Operations in the English-speaking Caribbean, 1982" in *EPI Newsletter* V-6 (December 1983) for additional details on Caribbean immunization programs and disease incidence.

The EPI Vaccines: Indications and Contraindications

The first part of this article was published in **EPI Newsletter** *V-6 (December 1983) and dealt with the specific adverse reactions associated with BCG, DPT, measles and polio immunization, as well as the immunization of ill or malnourished children.*

National policies concerning contraindications to immunization: agreements and disagreements

Countries have adopted similar policies with respect to certain possible contraindications to immunization and different policies with respect to others. Policies are often based on theoretical concerns rather than acts; needed data frequently are lacking. There is general agreement that immunization should be deferred in the presence of a severe febrile illness. The reasons are to avoid the risk of superimposing possible adverse effects from the vaccine on the underlying febrile disease, and to avoid a manifestation of the illness being attributed to the immunization.

There is also a consensus that vaccines requiring multiple doses such as DPT should not be repeated if a severe reaction occurred after a previous dose. Such reactions include collapse or shock-like state, persistent screaming episodes, temperature above 40°C, convulsions, severe alterations in consciousness or other neurological symptoms, anaphylactic reactions, thrombocytopenia or hemolytic anemia. In the case of DPT, subsequent immunization with diphtheria and tetanus toxoid is recommended. Local reactions at the site of injection or mild fever do not by themselves preclude the further use of DPT or other vaccines.

Also, live vaccines should not be administered to persons with immune deficiency diseases or to persons whose immune response may be suppressed because of leukemia, lymphoma, generalized malignancy or therapy with corticosteroids, alkylating agents, antimetabolic agents or radiation.

There is disagreement about other issues. For simplicity a few examples have been selected from two English-speaking countries, the United Kingdom and the United States, both of which have well developed immunization services and both of which have clear national recommendations concerning the indications for immunization. In the United Kingdom, the Department of Health and Social Security includes untreated tuberculosis as a contraindication to measles immunization, and recommends that children with a history of convulsions, epilepsy, chronic heart or lung disease or who are seriously underdeveloped, be given measles vaccine only with the simultaneous administration of human immunoglobulin. The United States Public Health Service Advisory Committee on Immunization Practices (ACIP), on the other hand, finds no convincing evidence that measles immunization exacerbates tuberculosis and concludes that the benefit of measles immunization far outweighs the theoretical risk of exacerbation of tuberculosis. The ACIP recommends that measles vaccine should never be administered simultaneously with immunoglobulin and does not recognize any neurological contraindications to measles immunization.

In the United Kingdom gastro-intestinal disturbances, including diarrhoea, are considered contraindications to oral poliomyelitis immunization, but not in the United States. In the United Kingdom, a family history of neurologic disease and developmental defects are contraindications to DPT immunization, but not in the United States. In the United States an evolving neurologic disorder is considered a contraindication, but not a static neurologic disorder such as cerebral palsy or a family history of neurologic disease.

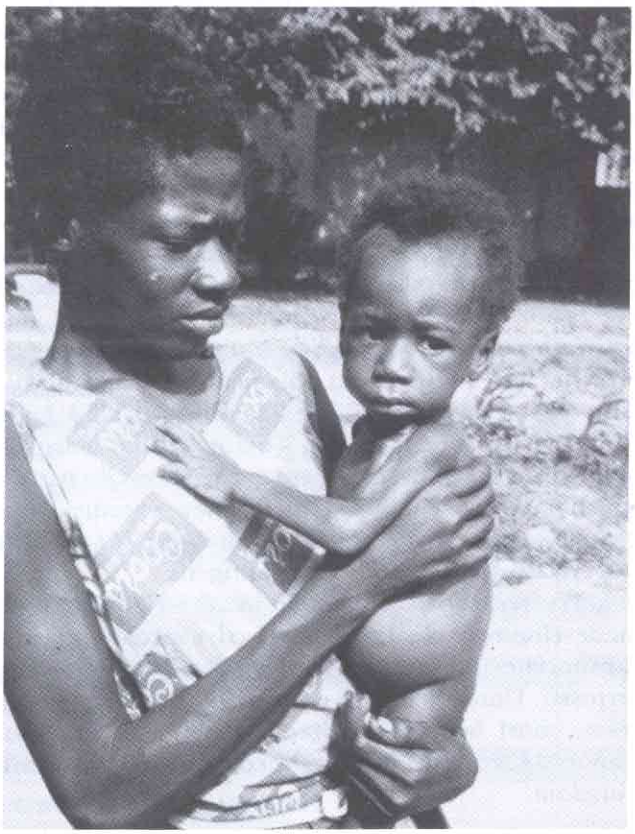
Recommendations of the Expanded Program on Immunization

It does not seem feasible nor desirable to formulate a universal set of recommendations for immunization of children. Each country should formulate its own policies reflecting local appraisal of risks and benefits, operational feasibility and socio-cultural acceptability of the specific recommendations. The national health authorities responsible for providing immunization services should play an active role in formulating the policies.

Whatever specific policies are adopted, health workers should know that the benefits of routine childhood immunization are great, and the risks of serious adverse reactions are very low. Absolute contraindications to immunization with the EPI vaccines are very few and, in general, children should not be denied immunization without good reason. Health workers should use every opportunity to immunize all eligible children, including ill or malnourished children. It is particularly important to immunize ill or malnourished children under the following circumstances:

- where there is a high incidence or an increased severity of the EPI target diseases, especially in children less than 18 months old;
- where access to health services is limited, where prompt follow-up is difficult and where immunizations are not likely to be completed if postponed;
- where immunization coverage is low;

- where children are most likely to visit the health services only when they are ill;
- where admission to hospital or attendance at health facilities is, in itself, an important factor in the spread of infectious diseases of childhood, particularly measles;



Immunization of malnourished children with the EPI vaccines has been shown to be safe and effective *(Photo: C. de Ville, PAHO)*

- where refusal to immunize is likely to result in the child not being brought back for further immunizations.

Health workers will inevitably be faced with using their own best judgment when considering the immunization of an individual child. Often they have little time for screening, and need some simple and clear guidelines. The following are proposed:

- Every child visiting a health facility should be screened to determine immunization status, and eligible children should be immunized.
- Children with malnutrition, low grade or moderate fever, respiratory infection, diarrhoea or other minor illnesses should be immunized. Immunization of children so ill as to require hospitalization should be deferred for decision by the hospital authorities.
- Hospitalized children should be immunized before discharge and in some cases upon admission—for example, where there is a risk of hospital-acquired measles.
- A DPT series should be completed unless a child suffered a severe adverse reaction to a previous dose. If so, diphtheria and tetanus (Td or DT) vaccine without pertussis antigen should be given instead.
- Children with diarrhoea should be offered oral polio vaccine. However, this dose should not be counted as part of the full series and the child should be given another dose at the first available opportunity.

Source: *Immunization of children: Indications and contraindications for vaccines used in the Expanded Program on Immunization.* WHO working paper EPI/GAG/82/WP.8/Rev. 3 (complete copy including all bibliographic references available on request to the editor).

Statement on Pertussis Vaccine

The introduction of pertussis vaccination in the United States in the 1940s and the subsequent decrease in cases of whooping cough (pertussis) represent an important example of the practical application of microbiology in disease prevention. In 1981, 1,248 cases of pertussis were reported to the U.S. Public Health Service, a remarkable decrease from the more than 250,000 cases per year experienced before the introduction of vaccination.

Although it is clearly an effective immunizing agent, the vaccine is associated with a high rate of undesirable side effects. The majority of these are local soreness or mild systemic reactions, such as fever, that are annoying but of no real consequence. Rarely, neurological reactions have been associated with vaccine administration. Despite these reactions, most public health scientists and clinicians in the United States agree that the benefits of pertussis vaccination outweigh the risks of its administration. The assumption is that it is more reasonable to accept the probability of some discomfort and the rare possibility of a serious untoward reaction than to risk the certainty of pertussis disease with its high morbidity and possible mortality.

Vaccination is the only method of proven effectiveness for the control of whooping cough. Chemotherapeutic agents are of limited value and only if given during the prodromal stages of disease, although they may have some value for the treatment of bacterial infections secondary to pertussis.

Passive immunization is not of proven effectiveness and in any case is not suitable for widespread application.

With the decline in the incidence of pertussis, there is concern that the use of pertussis vaccine may constitute a greater risk than the disease, and the appropriateness of continuing routine vaccination has been challenged. Experience has shown, however, that the causative agent is widely present in the population and can serve as a source of epidemic disease. Therefore, if pertussis vaccination programs were cancelled, large numbers of nonimmune infants would be at risk.

Recent British experience provides a dramatic illustration of the result of a decrease in vaccination. In 1974, after reports in the media of brain damage alleged to be caused by immunization with pertussis vaccine, the acceptance levels for vaccine in England fell from 79 percent in 1973 to 31 percent in 1978. The British Joint Committee on Vaccination and Immunization, anticipating an increase in the number of susceptible children, predicted an epidemic of pertussis in 1977. The epidemic did indeed start in late 1977. More than 102,500 cases of pertussis and 36 deaths were reported in England and Wales from the last quarter of 1977 through 1980. During the winter of 1981-82, approximately 1,400 cases of pertussis per week were reported. There have been 49,543 notifications recorded for the first nine months of 1982, with 2,067 new cases for the week ending 8 October.

Extrapolating this to the United States would mean that about 10,000 cases per week would be expected during an epidemic. The British experience demonstrates the value of pertussis vaccine prophylaxis and documents its effectiveness in controlling the disease.

Recent studies on the efficacy of pertussis vaccine have shown that there is a loss of vaccine protection with time, and pertussis infections have been reported in older children and adults. Estimates of vaccine efficacy range from 80 to 95 percent. These observations indicate the limitations of the vaccine and emphasize the need for research to improve it. Several studies have confirmed the effectiveness of the vaccine in protecting close contacts of cases and have shown that the attack rate of pertussis was significantly lower and the disease milder in vaccinated than in nonvaccinated case contacts. The fact remains that the proper use of pertussis vaccine effectively controls widespread disease and prevents serious infection and mortality in young children.

The reaction rate also has been reexamined recently. Local reactions and mild systemic reactions are complications of the vaccine. A study, reported in 1981, of over 15,000 children in the United States showed that these reactions occur with currently licensed vaccines. Serious reactions were rare, and there were no long-term adverse effects among the 15,000 subjects. In the United Kingdom, the role of pertussis vaccine as a cause of neurological disease was assessed by studying all children hospitalized for neurological diseases. Again, the study suggested that there is a risk, but less than had been suggested by some opponents of the vaccine. The report of the National Childhood Encephalopathy Study estimated that the attributable risk of persistent neurological damage one year after pertussis vaccination was 1 in 310,000 immunizations (95 percent confidence limits, 1 in 5,310,000 to 1 in 54,000 immunizations).

Pertussis vaccine is effective, but it has a reaction rate that is much higher than is exhibited by other vaccines in general use. There has been no significant change in the vaccine since its original formulation in the 1940s. Clearly we need an effective vaccine with fewer side effects, and modern technology should make this possible. Recent studies of host-parasite interactions in pertussis and on the immunochemistry of *Bordetella pertussis* have identified two potential immunogens, as well as several other components of *B. pertussis* that are candidates for inclusion in a new acellular pertussis vaccine. The new acellular pertussis vaccines probably will contain lymphocytosis-promoting toxin (also known as lymphocytosis-promoting factor, lymphocytosis-promoting factor-hemagglutinin, histamine-sensitizing factor, islet-activating protein, and pertussigen), filamentous hemagglutinin (also known as fimbrial hemagglutinin), and greatly reduced levels of endotoxin. Toxins will be inactivated with formalin. The other components of *B. pertussis* which might be included in the new vaccines would include tracheal cytotoxin, dermonecrotic toxin, adenylate cyclase, and certain surface antigens.

There is reason to believe that we are well on our way to the development of safer, more effective vaccines, given the appropriate support of laboratory and clinical research on pertussis. Until then, active pertussis immunization programs must be continued to prevent a resurgence of whooping cough, such as occurred in the United Kingdom.

Source: Calvin C. Linnemann, Jr., Frederick C. Robbins, and Charles R. Manclark, *ASM News* 49(12):580-581, 1983.

Editorial note: As yet there is no vaccine that is 100 percent safe and protective. The issue of disease versus adverse reactions will be a continuing controversy as long as ideal vaccines are not available.

It has been shown that the risks involved in the use of all the EPI vaccines are minimal as compared to the effects of the diseases they prevent.[1] Community education activities should be continued to convince the public of the importance of maintaining high immunization coverage levels, particularly when a successful program has resulted in reducing the number of cases of a disease to such an extent that it is no longer perceived as a threat to the community. At the same time, research and development efforts in the search for new and improved vaccines should be supported so that the incidence of vaccine-related illness can be reduced to the absolute minimum.

[1] See "The EPI Vaccines: Indications and Contraindications" in *EPI Newsletter* V-6 and this issue, page 4.

Reported Cases of EPI Diseases

Number of reported cases of measles, poliomyelitis, tetanus, diphtheria and whooping cough, from 1 January 1983 to date of last report, and for same epidemiological period in 1982, by country

Sub-Region and Country	Date of last report	Measles		Poliomyelitis		Tetanus				Diphtheria		Whooping Cough	
						Non-neonatorum		Neonatorum					
		1983	1982	1983	1982	1983	1982	1983	1982	1983	1982	1983	1982
NORTHERN AMERICA													
Canada	24 Dec.	915	1,064	—	—	5	10	...	...	12	11	2,198	2,314
United States	31 Dec.	1,436	1,728	8	7	75	81	...	...	5	3	2,258	1,882
CARIBBEAN													
Antigua and Barbuda	5 Nov.	7	—	—	—	1	—	—	—	—	—	—	—
Bahamas	31 Dec.	2,868	50	—	—	—	2	—	—	—	—	8	8
Barbados	24 Dec.	6	6	—	—	6	5	—	—	—	2	—	12
Belize	28 Dec.	11	6	...	...	1	4	—	5	—	4	1	—
Cuba	19 Nov.	2,914	22,931	—	—	20	17	—	—	—	—	268	877
Dominica	26 Nov.	1	2	—	—	1	—	1	—	2	—	11	6
Dominican Republic	30 Sep.	2,326	2,656	7	122	78	63	16	5	77	102	225	182
Grenada	31 Dec.	295	1,713	—	—	—	3	—	—	—	—	—	—
Haiti	26 Nov.	652	936	62	33	162	202	30	47	23	26	392	1,461
Jamaica	1 Oct.	1,051	2,567	—	58	1	11	2	—	9	13	60	324
Saint Lucia	29 Oct.	70	1,211	—	—	1	6	...	...	—	—	—	8
St. Vincent and the Grenadines	1 Oct.	63	747	—	—	...	—	...	—	—	—	...	—
Trinidad and Tobago	13 Aug.	1,794	913	—	—	10	9	—	—	—	2	—	1
CONTINENTAL MIDDLE AMERICA													
Costa Rica	17 Dec.	37	162	—	—	5	14	2	2	—	—	50	58
El Salvador	29 Oct.	2,070	3,480	74	16	41	43	31	76	13	13	410	1,671
Guatemala	8 Oct.	2,356	3,630	136	32	70	56	...	...	11	13	1,018	1,225
Honduras	31 Dec.	1,181	2,446	9	8	24	29	—	2	—	—	544	1,313
Mexico	*	...	...	...	...	...	...	...	...	...	...	...	...
Nicaragua	31 May	57	131	—	—	66	...	...	...	3	—	36	271
Panama	1 Oct.	509	3,642	—	—	5	4	9	13	—	—	149	58
TROPICAL SOUTH AMERICA													
Bolivia	8 Oct.	1,029	1,145	6	5	86	72	...	...	46	13	1,007	1,145
Brazil	19 Nov.	47,521	34,252	27	64	1,160	1,531	444	406	3,385	3,075	22,744	48,148
Colombia	19 Jun.	4,221	4,393	58	40	196	273	160	...	46	40	2,390	2,483
Ecuador	3 Sep.	973	1,194	5	8	58	45	49	49	18	28	664	1,217
Guyana	24 Sep.	—	13	...	...	—	1	...	...	—	—	—	—
Paraguay	17 Dec.	1,077	756	11	68	72	65	130	113	4	16	269	515
Peru	26 Jun.	211	1,087	6	91	18	29	—	...	1	4	276	912
Suriname	6 Nov.	14	33	—	1	...	...	...	...	1	2	—	12
Venezuela	1 Oct.	8,327	10,069	—	12	—	—	—	—	—	2	2,459	2,382
TEMPERATE SOUTH AMERICA													
Argentina	9 Nov.	3,911	3,574	...	—	114	...	...	...	39	35	2,818	5,692
Chile	31 Dec.	6,750	9,522	—	...	32	34	1	...	81	128	149	394
Uruguay	24 Dec.	8	149	—	—	4	16	—	1	—	—	205	598

* No 1983 reports received, therefore 1982 data not shown.

— No cases
... Data not available

Meetings

Fourth International Symposium on Pertussis

The Fourth International Symposium on Pertussis will be held on 25-27 September 1984 in Geneva, Switzerland. The Symposium is sponsored by the International Association of Biological Standardization and the World Health Organization. Those interested in microbiology, immunology, vaccine research and development in general, and pertussis vaccine in particular, are invited to attend.

For additional information, contact Dr. Charles R. Manclark, National Center for Drugs and Biologics, 8800 Rockville Pike, Bethesda, Maryland 20205 (USA).

Second Regional Meeting for Latin American EPI Managers

EPI Managers from Latin America will meet on 5-9 March 1984 in Lima, Peru, to set their 1985 targets for immunization coverage and disease reduction. Participants will have an opportunity to assess progress made since the first regional meeting in Quito, Ecuador, in 1981, and to discuss their new work plans for 1984-1985.

The meeting will follow the same general format as the one held in Trinidad in November 1983 for EPI Program Managers from the English-speaking Caribbean and Suriname (see article on page 1).

Symposium on Prevention of Congenital Rubella Infection

A Symposium on the Prevention of Congenital Rubella Infection will take place on 13-15 March 1984 at the Pan American Health Organization's headquarters in Washington, D.C. The meeting will be divided into seven sessions, covering the following topics: definition of the problem, epidemiology of rubella and congenital rubella infection, rubella vaccines, use of the laboratory, research needs, immunization strategies, and conclusions and recommendations.

Over 200 persons are expected to attend, including research scientists, epidemiologists, public health officials, representatives of national and international organizations, and participants from the corporate sector.

Information on preregistration can be obtained by writing to: Chief, International Studies Branch, Fogarty International Center, Building 16A, Room 205, National Institutes of Health, Bethesda, Maryland 20205 (USA).

New Publication: Recent Advances in Immunization

What is the optimal age for measles vaccination? How effective is each of the three recommended doses of oral polio vaccine? What is the protective effect of combined diphtheria and tetanus toxoids and pertussis vaccine? What are the effects of malnutrition and parasitic infections on the immune response? These and other questions are discussed in *Recent Advances in Immunization: A Bibliographic Review* (PAHO Scientific Publication No. 451), a comprehensive review of the literature which attempts to answer many of the most common questions posed by health professionals involved with program implementation.

The publication is available in English and Spanish from the Pan American Health Organization at a cost of US$7.00. English copies may be obtained by writing to Distribution and Sales, Pan American Health Organization, 525 Twenty-third St., N.W., Washington, D.C. 20037 (USA). For Spanish copies, write to Servicio de Publicaciones y Documentación de la OPS/OMS, Apartado Postal 105-50, 11570 México, D.F., México.

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