



EPI Newsletter

Expanded Program on Immunization in the Americas

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IMMUNIZE AND PROTECT YOUR CHILD

December 1986

Polio in the Americas: Weeks 1-53, 1986

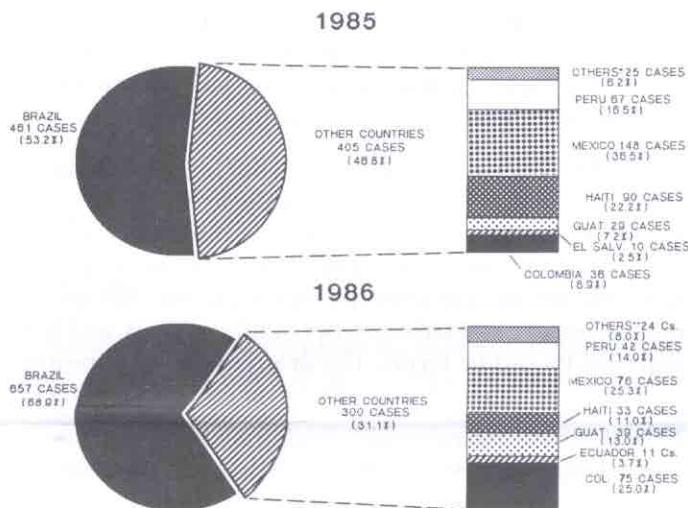
The distribution of 1986 and 1985 polio cases reported in the Americas is shown in Figure 1. Of the 13 countries reporting cases in 1986, five (Bolivia, Brazil, Colombia, Ecuador and Guatemala) show an increase in cases over 1985; seven (Dominican Republic, El Salvador, Haiti, Mexico, Peru, United States and Venezuela) reported fewer cases in 1986. Honduras reported the same number of cases in each year. The proportion of cases reported by Brazil rose due to increased surveillance activities in that

country and to decreased numbers of cases reported by other countries in the Region.

Figure 2 illustrates that during 1986 the number of cases reported by 4-week periods (957) was superior to the number reported for the same period in 1985 (866) except for weeks 37-44.

An examination of the polio morbidity rates for 1986 (Figure 3) shows that although Brazil had the highest number of cases, Haiti had the highest rate per 100,000.

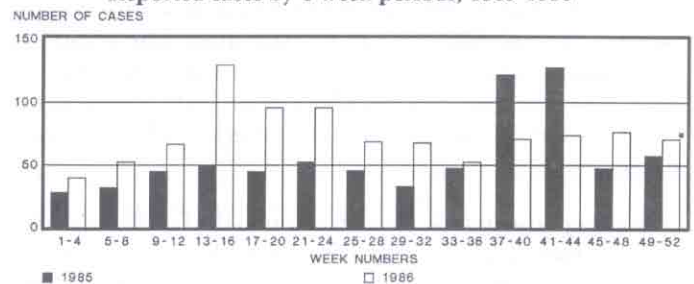
FIGURE 1. Distribution of Reported Polio Cases in the Americas, 1985-1986 (provisional data)



*Argentina (2), Canada (1), Dominican Republic (2), Honduras (4), Paraguay (3), USA (5), Venezuela (8),

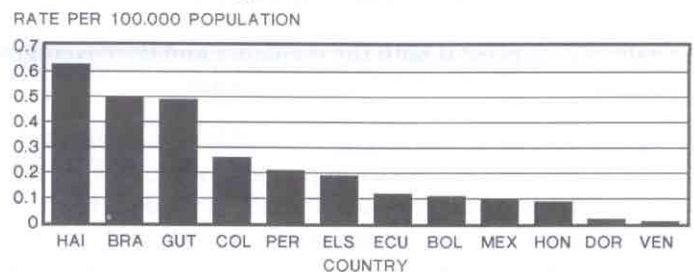
**Bolivia (7), Dominican Republic (1), El Salvador (9), Honduras (4), USA (1), Venezuela (2)

FIGURE 2. Polio in the Americas Reported cases by 4-week periods, 1985-1986



* An additional 9 cases were reported for week 53 in 1986
Source: PAHO

FIGURE 3. Polio Morbidity Rates (per 100,000 population), 1986 Region of the Americas*



*Excludes single, imported case in USA
Source: PAHO

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Efficacy of Infant BCG Immunization

BCG immunization is widely practiced within the Expanded Program on Immunization (EPI). However, information on the efficacy of BCG in preventing childhood tuberculosis is scarce, and the policy has been challenged by the results of a large-scale controlled trial in South India. Recent studies, which have been designed to avoid the pitfalls of earlier trials, now confirm that BCG immunization of newborns and young children provides a significant level of protection against tuberculosis in childhood, especially against tuberculous meningitis where the protective effect may be as high as 95%. WHO continues to recommend BCG immunization for all newborns or young children in high-risk countries or areas.

In accordance with the recommendations of a WHO Study Group, the Organization initiated a program of evaluating BCG immunization of newborns and young children in developing countries using two techniques. The first is the case-control study, in which the immunization coverage is determined in patients and in matching controls so that the relative risk of the unimmunized child contracting tuberculosis can be estimated. The second is the contact study, in which the relative risk is determined from the incidence of tuberculosis in actively followed-up child contacts of newly detected patients with infectious tuberculosis.

Both techniques use stratification to deal with the problem of comparability, an issue which has frequently evoked justifiable criticism of studies other than controlled trials. In case-control studies the controls are matched with the cases for characteristics which could influence the incidence or the immunization coverage, such as sex, age, and socioeconomic status. In contact studies these characteristics are recorded, and stratified analysis is applied if both the incidence and the coverage are found to vary from stratum to stratum.

Since both techniques make it possible to include many cases at low cost and in a short period of time, they are far more efficient than controlled trials, provided that the BCG immunization coverage is not extremely high or low. The techniques can be used to advantage where an immunization program is already established in a country, and therefore controlled trials might not be justified ethically. Five such studies have been completed with support from WHO.

WHO-supported studies

In a case-control study in São Paulo, Brazil, 73 cases of tuberculous meningitis were traced that occurred in 1981-1983 in children up to 4 years of age admitted to two

hospitals. For each case, seven neighborhood controls and one hospital control were matched for age, sex, area and socioeconomic status. Fifty-two percent of cases had previously been immunized, compared with 90% of controls. The estimated protective effect was 90% or 87%, depending on whether the neighborhood or hospital controls were considered. Of the 73 hospital cases, 37 had died from meningitis, 19 had serious, and 4 mild neurological sequelae, 2 died later, and the remaining 11 appeared healthy. Therefore, as regards tuberculous meningitis alone, over 400 deaths and over 200 cases of serious sequelae have been prevented so far in the population in which the cases occurred.

A contact study carried out in Bangkok, Thailand in 1981-1984, included 1,507 child contacts, up to 5 years of age, of newly detected smear-positive cases of pulmonary tuberculosis. Of the 218 children diagnosed as having tuberculosis (mostly by X-ray), 158 were from the group of 1,253 who had been immunized and 60 from the group of 253 who were unimmunized. Detailed analysis showed a protective effect of 53% against all forms of the disease, indicating that in the study population 185 cases were probably prevented by the immunization. The protective effect was over 60% against multiple lesions and extrapulmonary tuberculosis, but lower for other forms.

Another contact study was carried out in Lomé, Togo in 1983-1985 in 1,421 child contacts up to 6 years of age, among whom 175 were found to suffer from tuberculosis: 62 cases among the 875 immunized, and 113 among the 546 non-immunized. The protective effect was over 80% for the more extensive and serious types of tuberculosis, and less than 50% for milder forms. The protective effect appeared to be reduced in children under 1 year and over 4 years of age.

In Rangoon, Burma, a hospital-based case-control study was carried out in children up to 5 years of age in 1982-1985 comprising 311 cases, each with 5 controls matched for age, sex and township. The immunization coverage was 52% among the cases and 64% among the controls. The protective effect was 39%, with 95% confidence limits of 22% and 52%. Protection was only 20% among 89 cases classified as primary complex, and apparently there was no protection against abdominal and bone tuberculosis. Protection was about 50% for tuberculous pneumonia, lymphadenitis and meningitis, and 80% for disseminated tuberculosis. Protection decreased with increasing age.

A similar study carried out in Buenos Aires, Argentina, comprised 175 cases up to 5 years of age and 875 controls matched for age, sex, socioeconomic status and district.

Immunization coverage among the cases was 29% and among the controls 59%. Stratified analysis shows an overall protective effect of 74% (with 95% confidence limits of 82% and 62%). In this study, protection apparently increased with age from around 50% in children under 1, to more than 80% in children of 3 years of age and over.

Other retrospective studies

A few retrospective studies have been reported in industrialized countries that refer to the efficacy of BCG immunization in newborns. The incidence of tuberculosis among unimmunized children was found to be four times higher than that of immunized children in a study carried out in Manchester, United Kingdom, where BCG immunization was offered to newborns. A study from 1956 to 1979 in Israel showed that BCG immunization at birth had an overall protective effect of 38% in children 0-12 years, of 24% for pulmonary and 64% for extra-pulmonary disease. In Japan in 1979, 30 cases of tuberculous meningitis were reported in children aged 0-4 years. Only 3 of the children had been immunized, whereas the estimated coverage in this group was 69%. The data are compatible with a protective effect against meningitis of about 95%. In Sweden, BCG immunization of the newborn was discontinued in 1975. The incidence of the disease in children born in 1969-1974 was compared with the incidence in children born in 1975-1980. For pulmonary, miliary and meningeal tuberculosis there were 5 and 23 cases in the respective periods and for lymphadenopathy 1 and 13 cases. Furthermore, 78 cases of mycobacteriosis (mainly with *M. avium-intracellulare*) occurred after BCG immunization was discontinued, whereas only 1 such case had been observed in the previous period.

Conclusion

Although the results appear much less ambiguous than those of the controlled trials, estimates of protection still vary widely. Such variations, however, occur within studies as well as between them. The estimated immunization efficacy may have been reduced in several ways. Probably protection against the more serious forms is likely to have been estimated accurately, as serious forms of tuberculosis

stand out and are easier to diagnose than mild ones. In milder forms, evidence limited to hilar lymphadenopathy on X-ray may merely be indicative of recent infection. If these are counted as positive cases, "mild cases" will be over-estimated and will distort the data so that the protective effect of immunization appears to be lower.

A cause of diminished protection may lie in re-infection. Young children almost always contract infection through intrafamilial transmission, associated with an increased risk of disease, probably because the infectious load is larger or infection occurs repeatedly. In the latter case BCG may not show protection since the first infection will have induced immunity, whether or not BCG immunization was carried out.

Finally, the reduced protection observed in the youngest children may be explained by the possibility that the index case already existed (undetected) when the child was born so that infection may have occurred before BCG had induced immunity.

Although the foregoing factors may explain, to some extent, the variations in protection, a more important issue is probably the quality of the immunizations. Although it is not possible to tell whether a particular vaccine is more effective than another, there seems to be ample room for technical improvement in vaccine administration. Tuberculin testing carried out in the contact studies revealed that even those who received BCG vaccine often showed little or no skin reaction, suggesting that immunization had induced very little lasting sensitivity. Notwithstanding the fact that the response in the newborn is known to be reduced, it appears that the dose of vaccine administered is sometimes too small.

In view of the importance of intra-familial transmission of childhood tuberculosis, WHO recommends that in high-risk countries and areas, immunization of infants should continue to be carried out, within the EPI, as early in life as possible. Although the response to BCG may be reduced at this age, studies have shown that there is significant protection provided in childhood by BCG immunization against all forms of tuberculosis, but especially for the more serious forms, such as tuberculous meningitis.

Source: *Weekly Epidemiological Record* 61(28):216-218, 11 July 1986.

Nosocomial measles

Although nosocomial transmission of measles among children attending pediatric clinics is well known, no quantitative study including a control group has been reported.

In 1985, a study of this kind was carried out in a maternal and child health clinic on the outskirts of Abidjan (Ivory Coast) where 11,000 children are seen each month. The clinical criteria for identifying measles patients were:

oculo-respiratory catarrh with Koplik's spots or typical rash. Patients with measles were paired with patients of the same age selected from other children attending the clinic for an illness other than measles. In the measles patients the probable date of infection was determined by the stage of the rash at the time of examination, on the basis of predefined criteria.

Measles patients who attended the clinic on a date compatible with the probable date of their infection, together with those controls who had attended the clinic 8-21 days earlier, were considered to have been exposed.

The statistical analysis was performed for (a) the entire population; (b) the immunized population; (c) the unimmunized population and each of 3 age groups (<9 months, 9-11 months, ≥12 months). The relationship between measles and exposure was studied by means of the χ^2 test when the expected cell sizes were sufficiently large or by the Fisher exact test. The relative risk (RR) was estimated from the odds ratio (Ψ); the confidence interval for the RR was estimated by Cornfield's method. The attributable risk of measles to attending the health unit was calculated in the light of the frequency of the disease among the patients attending the clinic.

Results

A total of 140 children were included in the study (70 with measles and 70 controls). Of the 70 measles patients, 55 had visited the clinic 8-21 days earlier (Table 1), and 50

were considered to have been exposed during that visit. Twenty-four controls out of 70 had a history of measles and were therefore excluded from the study; of the remaining 46, 3 had attended the clinic 8-21 days earlier (Table 2). The proportion of clinic attendees is significantly lower among the controls than among measles patients (3 out of 46 as against 50 out of 70; $\chi^2 = 47.1$, $p < 10^{-8}$). The relative risk is estimated at 30.6 (9.2 to 102 at 5% risk). In view of the frequency of the disease among clinic attendees (10% during an outbreak), the proportion of clinic patients exposed can be estimated to be 13%, on the basis of the study findings. The corresponding attributable risk is 67%.

The estimates are similar for unimmunized subjects (64 with measles and 21 controls). The age distribution of the 2 groups does not differ significantly. The frequency of exposure is significantly lower among the controls than among the measles patients (0 out of 21 as against 46 out of 64; $\chi^2 = 39.2$, $p < 10^{-6}$). The odds ratio was not calculated since no controls were exposed. In view of the proportion of clinic patients exposed (13%), the attributable risk is 81%.

TABLE 1. Measles transmission through attending a health unit, relationship between time elapsed since last clinic consultation and stage of measles, Ivory Coast, 1985^a

Stage of measles	Time in days since last consultation											Total exposed
	11	12	13	14	15	16	17	18	19	20	>30	
Koplik spots	4	1	3								(3)	8/11
Head	1		2	3		1	1		(1)	(1)	(5)	8/15
Neck-shoulders			4	3	2	2					(3)	11/14
Abdomen		(2)	2	4	4	5	1	1		(1)	(2)	17/22
General				3		1					(2)	5/7
Desquamation										1	-	1/1
TOTAL						55					(15)	50/70

^a Figures in parenthesis: subjects not exposed

TABLE 2. Attributable risk to attending health unit, measles patients and controls, by age and immunization status Ivory Coast, 1985

	Measles patients				Controls		χ^2	p	OR	CI	AR
	E		NE		E	NE					
	(1)	(2)	(1)	(2)							
Immunized	4	2	3	22	-	-	10 ⁻²	11.6	(1.7-78.3)	0.52	
Unimmunized	46	18	-	21	39.2	-	10 ⁻⁶	-	-	0.81	
<9 months	18	5	-	16	23.3	-	10 ⁻⁵	-	-	0.84	
9-11 months	12	4	1	9	10.4	-	10 ⁻²	17.6	(2.3-134)	0.65	
≥12 months	20	11	2	18	14.7	-	10 ⁻³	13.2	(2.9-59.4)	0.54	
TOTAL	50	20	3	43	47.1	-	10 ⁻⁸	30.6	(9.2-102)	0.67	

(1) Exposed (2) Not exposed
 (3) χ^2 test, or Fisher exact test
 (4) Odds ratio: OR = ad/bc

(5) Confidence interval: $\text{Log}(CI_1, CI_2)$
 = $\text{Log OR} \pm 1.96 (1/a+1/b+1/c+1/d)^{1/2}$
 (6) Attributable risk: AR = p (E) (RR-1)+1.

The reason for the previous visit was recalled by 111 of the mothers (68 mothers of measles patients and 43 mothers of controls) (Table 3). This information gives an indication of the profiles of the patients most exposed to the risk of measles of nosocomial origin. The frequency of routine visits was significantly lower among measles patients than among controls (5 out of 68 as against 13 out of 43; $\chi^2 = 10.2$, $p < 0.01$).

TABLE 3. Reason for previous consultation by measles patients and controls, Ivory Coast, 1985

Reason for previous consultation	Measles patients	Controls	Total
Routine visit	5	13	18
Acute disease ^a	63	30	93
TOTAL	68	43	111

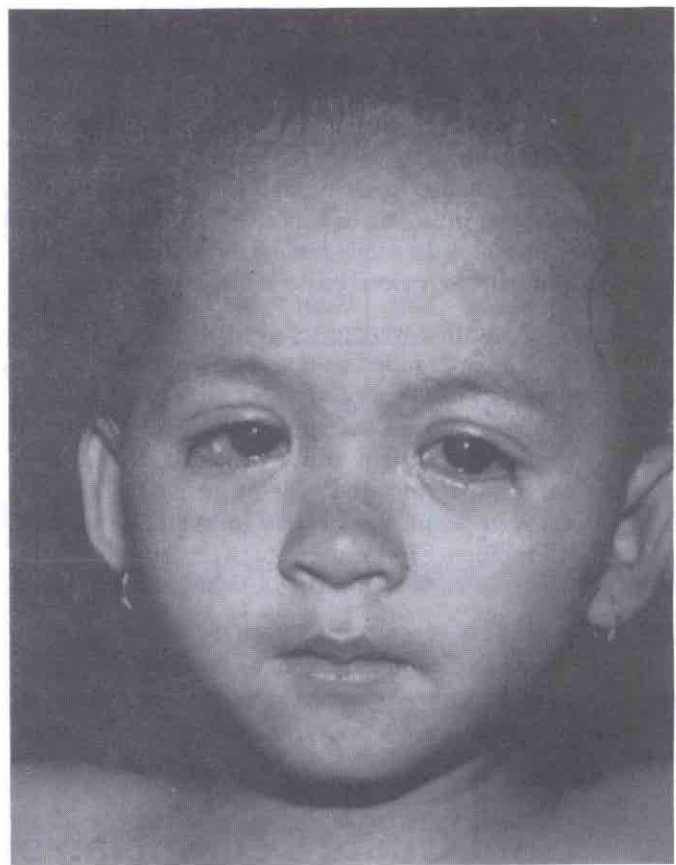
^a Malaria: 24 measles patients, 16 controls
 Pneumopathy: 13 measles patients, 3 controls
 Diarrhea: 17 measles patients, 7 controls
 Other: measles patients, 4 controls

Analysis of the findings

Although the survey was carried out at the end of an epidemic, the results showed that two-thirds of the measles cases treated in this clinic were of nosocomial origin.

It might be expected that in epidemic periods, measles would spread even more among clinic patients. Because of the way out-patient care is organized, infants are all exposed to the virus in the waiting-room. However, evaluation of immunization coverage among this population showed that 64% were immunized against measles. The Ivory Coast was one of the first countries to perform routine immunization of moderately febrile children, in accordance with WHO recommendations.

Some clinic attendees still go unimmunized and are particularly at risk: infants under 9 months, and children visiting the clinic occasionally who had a temperature of over 39°C on the immunization day.



Measles is a highly transmissible disease, especially in hospital wards, where the increase in disease burden may result in further deterioration of health status.

Recommendations

Routine immunization of clinic patients, including those with fever, would reduce the frequency of nosocomial transmission of measles.

Research on a measles vaccine that could be administered before the age of 9 months should be promoted.

Wherever possible the clinic's reception procedures should be improved, so that measles patients are quickly identified and kept away from the waiting rooms.

Source: Weekly Epidemiological Record (61)44:338-340, 31 October 1986. (Article based on a report scheduled for publication in WHO Bulletin, Vol. 65 (1987).)

Sudden Infant Death and DPT/IPV Immunization

Between 9 and 28 March 1986, five deaths occurred in France within 24 hours following the injection of a combined quadruple vaccine (DPT combined with inactivated poliomyelitis vaccine). In two cases, death occurred within less than one hour following immunization. There were four girls and one boy, ranging in age from 3 to 18 months. The vaccine had been administered subcutaneously. In

four of the five deaths the injection was the first dose of the combined DPT/IPV vaccine. All the deaths occurred in different departments of the country.

The health authorities conducted inquiries which included clinical analysis of the deaths, testing of the vaccine and epidemiological investigations. Autopsy records were available for three infants.

It was found that three of the five infants had evidence of an infectious process, probably of viral origin, responsible for lesions resembling those habitually found in many sudden infant deaths in wintertime: a focus of inflammation in the bronchi and the bronchioles, a case of very extensive acute pneumopathy, and a case of pharyngitis-tracheitis. Furthermore, three infants were found to have gastro-esophageal reflux, one had chronic nasal obstruction and two had their sleep pattern disturbed.

The vaccine samples were tested at the National Health Laboratory. The tests failed to reveal any toxicity or any other abnormality of the vaccine.

Epidemiological data have shown that sudden infant death is the most frequent cause of death in children between one month and one year of age: 90% of these deaths occur before the age of six months. The sudden infant death incidence in France is between one and three per 1,000 live births, which represents about 1,500 cases each year.

Taking into account the frequency of this syndrome in infants under six months of age and the frequency of DPT/IPV immunizations performed at that age, namely

three doses to be given at three, four, and five months respectively, one can expect that purely by chance some cases of sudden infant death will occur within 24 hours following vaccine administration.

Moreover, the results of clinical and pathological examinations, vaccine testing and analysis of epidemiological data suggest that the occurrence of five sudden infant deaths following immunization with the combined quadruple vaccine is in all likelihood a coincidence.

This is being further investigated in a case control study which has been initiated in order to determine whether there are any differences between the immunization schedule of victims of the sudden infant death syndrome and that of other infants. This investigation, which covers all infants who died suddenly at the eligible age for DPT/IPV immunization (3-12 months) between 1 January and 31 March 1986, is taking place in the context of an ongoing nationwide study on sudden infant death syndrome.

Source: Weekly Epidemiological Record 61(35):265-266, 29 August 1986. (Article based on Bulletin épidémiologique hebdomadaire, No. 24, 1986; Direction générale de la Santé.)

Cold Chain Technician's Course Held in Puerto Rico

An Expanded Program on Immunization (EPI) cold chain technician's course was held in Puerto Rico from 8 to 26 September, 1986. It was sponsored by PAHO/WHO in collaboration with the Office of International Exchange and Technical Cooperation, Commonwealth of Puerto Rico, State Department, who provided the venue and administrative assistance. There were 12 participants from 6 countries: Belize, Guyana, Suriname, Trinidad and Tobago, St. Christopher/Nevis, and Saint Lucia. The tutors were two WHO consultant engineers from England and Finland.



Participants in EPI cold chain technician's course perfect their skills in refrigerator repair and maintenance.

The course was designed for technicians who already work in health service refrigeration maintenance and repair. The objectives of the course were to provide the technicians with additional skills in preventive maintenance and to further their abilities to identify and assess problems as well as effect necessary repairs.

At the end of the course, the participants returned to their respective countries to assist in providing better maintenance and repair to the EPI cold chain system. By storing vaccines at their optimal recommended temperatures, in efficiently operating refrigerators and freezers, it is expected that they will preserve their efficacy. In addition to practical repair and maintenance, the course included a brief theory on the principle of refrigeration, the EPI diseases preventable through immunization and the current vaccines in use.

The procedures followed were those found in the WHO Handbook, Task Sheets and Manuals especially provided for this purpose. Participants read the materials which guided them systematically through the essential features of the electrical and cooling systems of refrigerators. After acquiring a clear understanding of the systems and how they work, tasks were set in the text for participants to perform in order to demonstrate that they understood and could correct the problems. Participants were divided into teams of two; each team had a refrigerator and the necessary tools and supplies with which to perform repair and maintenance measures. At the end of the course, the tools were given to the participants for their governments. It is

Reported Cases of EPI Diseases

Number of reported cases of measles, poliomyelitis, tetanus, diphtheria and whooping cough, from 1 January 1986 to date of last report, and for same epidemiological period in 1985, by country

Subregion and Country	Date of last report	Measles		Poliomyelitis§		Tetanus				Diphtheria		Whooping Cough	
		1986	1985	1986	1985	Non-neonatal		Neonatal		1986	1985	1986	1985
						1986	1985	1986	1985				
NORTHERN AMERICA													
Canada	01 Nov.	14,585	2,189	—	1	4**	6**	...	...	4	6	1,827	1,590
United States	29 Nov.	5,914	2,704	1	5	59**	67**	...	...	—	2	3,943	3,275
CARIBBEAN													
Antigua & Barbuda	04 Oct.	1	1	—	—	...	—	—	1	—	—	—	—
Bahamas	01 Nov.	68	23	—	—	—	6	—	—	—	—	—	—
Barbados	01 Nov.	2	2	—	—	2	—	—	—	—	—	—	13
Cuba	06 Sept.	2,810	2,359	—	—	13**	5**	...	...	...	...	293	100
Dominica	01 Nov.	60	60	—	—	—	—	—	—	—	—	—	—
Dominican Republic	22 Mar.	241	...	1	2	18	...	5	...	20	...	74	...
Grenada	01 Nov.	16	7	—	—	—	—	—	—	1	—	7	—
Haiti	14 Jun.	93	...	33	90	48	...	78	...	3	...	300	...
Jamaica	01 Nov.	29	64	—	—	1	2	—	—	2	—	1	1
St. Christopher/Nevis	04 Oct.	24	24	—	—	—	—	—	—	—	—	—	—
Saint Lucia	01 Nov.	7	9	—	—	—	2	—	—	—	—	—	—
St. Vincent and the Grenadines	01 Nov.	5	...	—	—	—	...	...	...	—	...	—	...
Trinidad & Tobago	25 Oct.	2,576	...	—	—	—	...	—	...	12	...	12	...
CONTINENTAL MID AMERICA													
Belize	01 Nov.	49	6	—	—	—	2	—	—	—	...	7	35
Costa Rica	01 Nov.	2,065	1	—	—	2**	5**	...	...	—	...	104	110
El Salvador	31 May	128	...	9	10	12	...	13	...	—	...	168	...
Guatemala	19 Apr.	651	...	39	29	15	...	1	...	...	...	189	...
Honduras	01 Nov.	454	5,883	1	4	44	16	12	5	—	—	180	221
Mexico	29 Nov.	8,060	18,949	76	148	246**	293**	...	...	21	4	1,086	2,052
Nicaragua	19 Apr.	668	...	—	—	...	...	...	...	—	...	115	...
Panama	04 Oct.	2,967	1,560	—	—	3	1	2	6	—	—	28	87
TROPICAL SOUTH AMERICA													
Bolivia	22 Mar.	25	73	7	—	...	5**	5	...	5	9	113	331
Brazil	01 Nov.	84,211	62,749	657	461	1,638	1,697	388	521	1,541	1,825	18,695	18,162
Colombia	*	...	...	75	36	...	...	...	...	...	...	...	...
Ecuador	26 Jul.	459	...	11	—	52	...	46	...	10	...	548	...
Guyana	09 Aug.	13	76	—	—	2	6	...	—	...	—	...	1
Paraguay	01 Nov.	282	464	—	3	68	53	...	59	16	17	98	288
Peru	01 Nov.	2,093	4,401	43	67	67	100	94	30	24	44	811	3,885
Suriname	09 Aug.	35	...	—	—	1	...	...	...	—	...	—	...
Venezuela	27 Sep.	10,093	...	2	8	73	...	12	...	3	...	2,508	...
TEMPERATE SOUTH AMERICA													
Argentina	26 Jul.	1,764	4,932	—	2	39**	52**	...	...	10	7	986	3,138
Chile	01 Nov.	9,925	9,608	—	—	15**	20**	...	...	209	165	31	611
Uruguay	*	...	...	—	—	...	...	...	...	...	...	...	...

* No 1986 reports received.

** Tetanus data not reported separately for neonatal and non-neonatal cases.

Total tetanus data is reported in non-neonatal column.

§ Data for polio is through week 53 (ending 3 January 1987).

— No Cases

... Data not available

expected that the participants will use the tools in their respective countries to maintain the EPI cold chain refrigerators more efficiently than in the past. In addition, it should be emphasized that the tools are the property of the respective governments and not the individuals.

In order to achieve effective immunization for all children of the world by the year 1990, it is imperative that the cold chain be efficiently monitored and maintained in all

countries. Continuing education courses such as the EPI cold chain technician's course will assure that a core of technically trained individuals are available to monitor and provide preventive maintenance as well as repairs to the national cold chain system.

Source: Reported by Henry C. Smith, Immunization Officer, PAHO/WHO.

V Congress of World Federation of Public Health Associations to be held in Mexico City

The V Congress of the World Federation of Public Health Associations will be held in Mexico City, Mexico from March 22-27, 1987. The theme of the Congress will be "International Public Health in an Era of Economic Constraints—The Challenge." Speakers at the Congress include Dr. Guillermo Soberón Acevedo, Secretary of Health for Mexico, Mr. James Grant, Executive Director, UNICEF, Dr. Carlyle Guerra de Macedo, Director, Pan American Health Organization and Dr. Abraham Horwitz, Director-Emeritus, Pan American Health Organization. The major presentations will cover the top-

ics of Economic Considerations for Primary Health Care and Child Survival, Cost Containment Through Appropriate Use of Technology, Manpower, and Cost-Effective Interventions, International Economic Cooperation in Strengthening Health Programs, Interrelationships Between Health and Economic Development, Women and Health: Social and Economic Perspectives, Confronting Special Problems: Population Growth, Natural Disasters, Famine, AIDS, and Aging.

A special session will be held dealing with the prevention of nuclear war, field visits to health programs in Mexico City and rural areas will be conducted.

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