



EPI Newsletter

Expanded Program on Immunization in the Americas

Volume VIII, Number 4

IMMUNIZE AND PROTECT YOUR CHILD

August 1986

Polio Update: Weeks 1-34

For the first 34 weeks of 1987, 686 cases of poliomyelitis were reported to PAHO/WHO; for the same period in 1985, there were 352 cases. A comparison of cases per 4-week period (to week 32) in 1985 and 1986 is presented in Figure 1.

In week 34 Bolivia reported its first case of polio since 1983. Four countries which reported cases in 1985 (El Salvador, Honduras, Paraguay and the United States) have not notified any cases in 1986. As shown in Figure 2, Brazil and Mexico together account for the highest proportion of cases in both years.

It should be noted that these data are continuously being updated as a result of further case investigation and

laboratory analysis. Some cases may subsequently be discarded and the number of cases reported for a particular week will be correspondingly reduced.

FIGURE 1

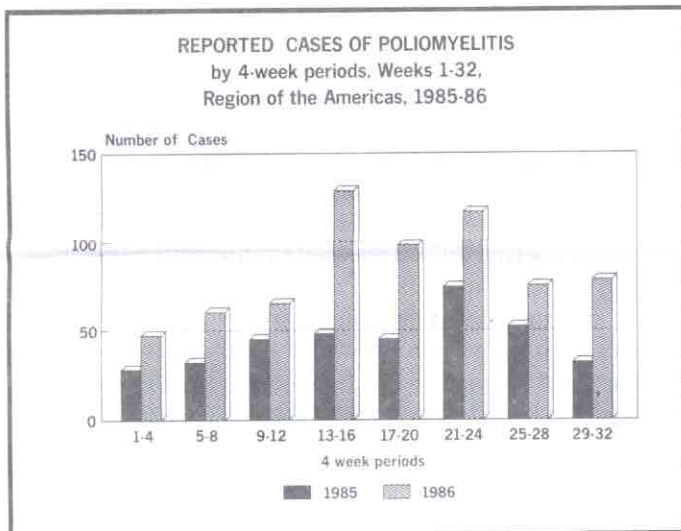
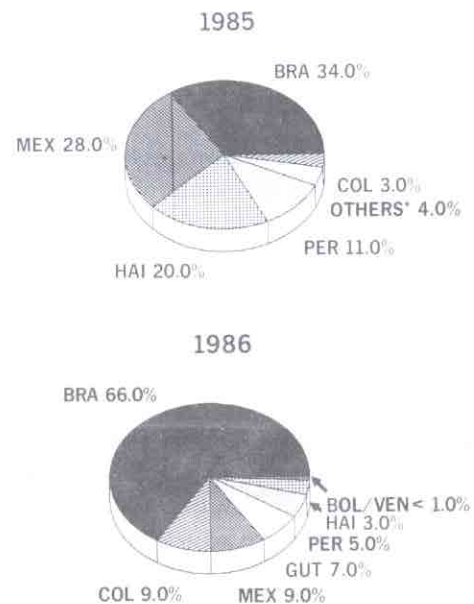


FIGURE 2

DISTRIBUTION OF POLIO CASES IN THE AMERICAS, BY COUNTRY Weeks 1-34, 1985 and 1986



* CAN, ELS, GUT, HON, PAR, USA, VEN.
SOURCE: Weekly telex reports to EPI/PAHO

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EPI Acceleration

The World Health Assembly has officially endorsed the seven EPI recommendations for program acceleration (1) with passage of its Resolution WHA 39.30 in May 1986. In accordance with the resolution, some specific activities to implement the recommendations at the national level are outlined below.

1. *Promote the achievement of the 1990 immunization goal at national and international levels through collaboration among ministries, organizations and individuals in both the public and private sectors.*

□ Ensure that WHO actively supports the government in coordinating multilateral, bilateral and non-governmental organization support to the national immunization program.

□ Identify coordinating mechanisms within the Ministry of Health (such as primary health care committees) and between the Ministry of Health and other Ministries (particularly Education, Internal Affairs, Community Affairs and Religious Affairs); send them relevant information on EPI; promote their involvement in implementing the program.

□ Encourage national managers to identify and work with non-governmental organizations able to support EPI, to provide them with the appropriate documentation and, for those operationally active, to supply them with EPI vaccines.

□ Promote participation of non-governmental organizations in EPI training, program reviews, meetings, immunization days/weeks and publicity events. World Health Day, 7 April 1987, will have immunization as its theme and could provide a rich opportunity for collaboration with other ministries and private and non-governmental organizations.

2. *Adopt a mix of complementary strategies for program acceleration.*

□ The WHO/UNICEF joint statement on "Planning principles for accelerated immunization activities" provides a number of suggestions which might be pursued.

□ Use World Health Day as a vehicle for publicizing and promoting EPI:

- Organize special immunization events.
- Encourage the involvement of leading political, medical and entertainment figures in such events.
- As one such event, use the day (or week or month) to check the immunization status of children and women of child-bearing age and to refer eligibles for immunization; encourage national medical or pediatric associations to be sponsors.

□ Ensure that program reviews, national meetings and consultant visits address the question of program acceleration.

3. *Ensure that rapid increases in coverage can be sustained through mechanisms which strengthen the delivery of other primary health care interventions.* Continuing monitoring and evaluation will help to identify problems at an early stage and permit remedial actions to be initiated.

□ Fix dates for next program review or follow-up visit.

□ Maintain a current listing of recommendations made during previous reviews which have not yet been implemented; decide on actions required for implementation and establish a time schedule; revise at least quarterly.

4. *Provide immunization at every contact point.*

□ Enlist the cooperation of clinicians in university settings and in medical and pediatric associations to persuade curative care facilities to include immunization in their services. The prevention of diseases such as measles and diphtheria may have a marked impact on reducing hospital admissions in many areas.

□ Encourage the formation of hospital committees; encourage existing committees to promote immunizations in the hospital setting.

□ Promote close collaboration between the Ministry of Health and pediatric/medical societies on immunization issues.

5. *Reduce drop-out rates between first and last immunizations.* High drop-out rates are undoubtedly due to a mix of causes in most countries, but it may be useful to determine if the problem can largely be solved simply by reinforcing good management practices on the part of the health staff (clean facilities, friendly reception, courteous reliable service, short waiting times, adequate information/motivation provided to the mother, etc.) or whether an in-depth review of community beliefs/practices is required to uncover problems which would otherwise remain unrecognized.

□ Use tickler files or follow-up registers to identify dropouts.

□ Promote channelling strategies or use lay staff to identify and immunize eligibles.

6. *Improve immunization services to the disadvantaged in urban areas.* A special approach may be called for in countries where municipal health services are not the responsibility of the Ministry of Health. One idea might be to conduct urban program reviews in major cities (those with populations greater than one million, for example). Such reviews could be carried out independently of national program reviews and would take less time and

(1) See *EPI Newsletter* VIII-1, page 4, February 1986.

fewer resources. Follow-up procedures could be the same as those used for national reviews.

- Prepare a list of cities with more than one million people; indicate for each the infant immunization coverage; decide whether coverage evaluation surveys and/or program reviews are indicated.

- Search for immunization delivery strategies which are particularly appropriate to such major cities. For example, periodic immunization weeks (perhaps twice a year) could be used to "top up" the coverage being achieved by the routine services. They may be useful in catching new arrivals and help to prevent epidemics of diseases such as measles.

- Determine for each city in which part(s) services are deficient and decide on strategies to increase urban immunization coverage.

- Establish local area monitoring systems on EPI diseases.

7. Increase priority for the control of measles, poliomyelitis and neonatal tetanus.

- In appropriate countries develop and implement elimination programs for polio and/or neonatal tetanus.

- Introduce/strengthen the use of tetanus toxoid cards in adult women; further develop coverage evaluation methods for tetanus toxoid immunization.

- Organize neonatal tetanus surveys as required.

- Where neonatal or adult tetanus remain problems, promote the immunization of women of childbearing age with tetanus toxoid on the same level of priority as infant immunizations.

Source: EPI Geneva memo EPI/18/WHA/39 dated 26 May 1986.

Polio in Brazil's Northeast - Study Suggests Low Vaccine Efficacy

Over 80 percent of the 1986 cases of poliomyelitis reported in Brazil have come from the Northeast Region. Disease activity persists in spite of continued efforts to block transmission, including local vaccination programs and a special regional vaccination day on 19 April, in addition to the regular national campaign day on 14 June.

No significant changes have been detected in the age distribution, vaccination history or urban/rural distribution of cases as compared to previous years. Of note, however, is the predominance of poliovirus type 3 (P3) which is responsible for 71 percent of the cases for which laboratory data are available (Figure 1). P3 also predominated in 1981, although in smaller proportions, which was attributed to the impact that the first national vaccination days had on type 1 poliovirus.

In order to identify factors affecting the current polio situation in Brazil's Northeast Region, a detailed analysis of data available at national level was carried out, concentrating on the following areas:

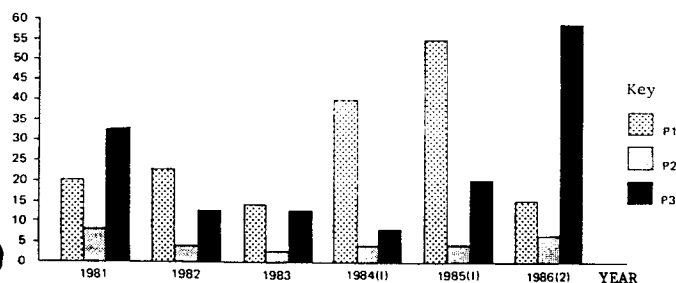
- determination of the vaccine efficacy in 1985 and 1986, based on estimations of vaccination coverage with three or more doses of vaccine, by 1-year age group, and data on disease occurrence in vaccinated children.

- comparison of antibody titers against the three types of poliovirus in 35 cases selected from those reported in the Northeast in 1986; the first sample was taken at 7 days after disease onset and the virus isolation tests were negative, thus reducing the possibility that wild poliovirus infections would interfere with the results.

Results of the analysis suggest low vaccine efficacy in 1986, especially for children under 2 years of age (40 percent). Considering that this did not occur in 1985 when type 1 predominated, it was concluded that the low efficacy might be due to the type 3 component of the vaccine. This was corroborated by the analysis of serologic data which consistently indicated that type 3 titers were always lower than those for type 1 or type 2, regardless of the number of doses received. The hypothesis of insufficient P3 immunization is also supported by the fact that, of at least six cases studied in vaccinees with three or more doses, none had detectable P3 titers.

These data suggest that the intensive and extensive circulation of type 3 poliovirus in the Northeast is associated with low vaccine efficacy, though this is not the only determining factor. This low efficacy could be due to the low concentration of P3 in the vaccine, or to the fact that

FIGURE 1. Number of poliomyelitis cases according to type of poliovirus isolated, Brazil, 1981-1986



(1) Provisional data

(2) Data to 2 July (week 27)

three doses of vaccine are not sufficient to provoke a satisfactory immunological response.

The Ministry of Health is studying the use of two special polio vaccines for use in selected areas during the next national vaccination day on 16 August—one monovalent type 3 vaccine with the usual titer (300,000 TCID₅₀) and a trivalent vaccine containing double the titer for type 3

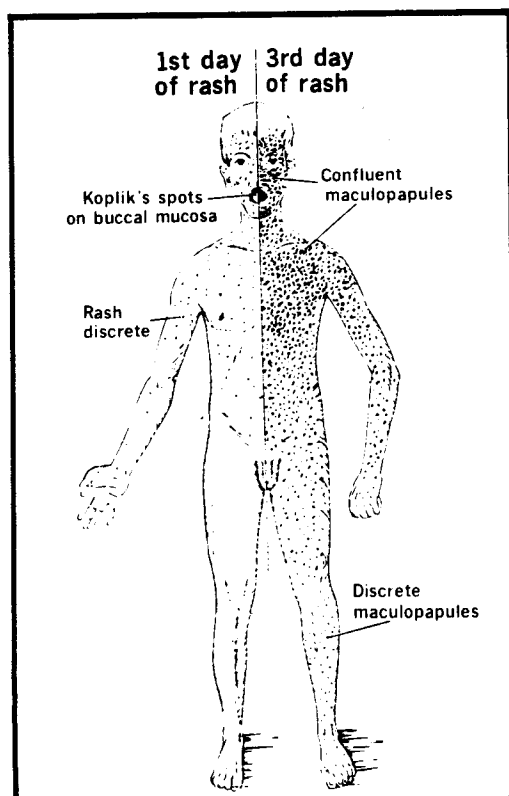
(600,000 TCID₅₀). A clinical-serological trial is being carried out to evaluate the advantages of these preparations in relation to the one currently being used. Results of the study should be available in early October.

Source: *Poliomielite Informe Semanal* 1(29), Ministry of Health, Brazil, 19 July 1986.

Why is there Measles in Panama?

Measles is an acute, highly contagious, viral disease characterized by fever, conjunctivitis, cough, and spots on the mucous membranes of the mouth (Koplik's spots) followed by a generalized maculopapular eruption, which usually appears on the fourth day of the disease (Figure 1). The rash and accompanying illness reach a climax on about the sixth day, subsiding a few days later, followed by complete recovery in most cases. The disease is most serious in nursing infants and adults. Complications such as pneumonia, otitis media, and encephalitis can arise. Pneumonia is the main cause of death in children with measles, mainly those under 2 years of age.

FIGURE 1. The development and distribution of measles rash



An effective vaccine against measles has been available since 1963. It prevents the disease in about 95% of the persons vaccinated. The vaccine is stocked and administered free of charge at health institutions around the country.

Current situation

In 1985, 1,286 children were treated for measles at the Hospital del Niño (Table 1). Of these, 379 had to be hospitalized and 6 died. Judging by the trend of the case curve, an estimated 322 additional children with measles will seek health care at the Hospital del Niño before the end of this epidemic. Based on the average cost of emergency room care (equivalent to approximately US\$10) and the daily hospitalization rate (\$50), and on an average length of stay of 4.8 days per measles patient in 1985, the measles epidemic will ultimately cost the Hospital del Niño more than \$130,000. To this should be added the cost of care at other health care centers in the country and the direct and indirect costs to the families of these children, not to mention the incalculable cost of the suffering and death of Panamanian children.

Vaccine efficacy and age of vaccination

Mathematical models have established that between 93.5% and 96% of the population must be immunized in order to completely eliminate measles transmission. Since the effectiveness of the vaccine is about 95%, it would be necessary to vaccinate virtually 100% of the susceptible population, in keeping with the goals of the World Health Organization.

In order to better understand the epidemiology of the outbreak, it was decided to look at vaccine efficacy and age of vaccination in order to improve control strategies. Based on reports from the Metropolitan Region Epidemiology Department of measles cases and vaccination history, and using the formula to calculate vaccine efficacy (the attack rate in the unvaccinated minus the attack rate in the vaccinated divided by the attack rate in the unvacci-

TABLE 1. Measles cases reported to the Hospital del Niño, by type of care received, and by age of occurrence, 1985

Type of care	Age								Total
	0-5 mo.	6-11 mo.	1 yr.	2 yr.	3 yr.	4 yr.	5-9 yr.	10-14 yr.	
Outpatient	75	199	181	69	58	54	171	100	907
Hospital	35	118	98	42	23	12	24	27	379
Total	110	317	279	111	81	66	195	127	1286

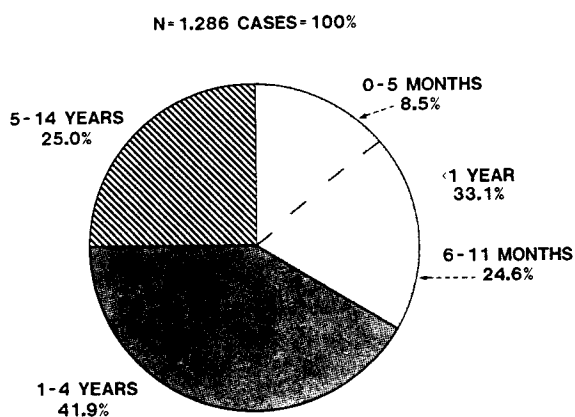
Source: Administration and Finance Division; Statistics and Records Department, Hospital del Niño.

nated), the effectiveness of the vaccine was estimated at 90%. This level is at the lower end of the normal limits for measles vaccine efficacy (90% to 98%).

There is disagreement about the ideal age for vaccination. PAHO/WHO, based on studies in Africa, Chile, Brazil, Ecuador, Costa Rica, and Haiti, recommends vaccination at 9 months, whereas the United States has concluded that vaccination should be performed at 15 months of age. Panama has taken an intermediate position by vaccinating at 9 months and revaccinating at 15 months. Also controversial is whether revaccination at 15 months is effective in children vaccinated before one year of age.

The age issue is important in Panama since, despite the considerable effort being made and the policy decision to hold national vaccination days, measles remains out of control. Several technical issues are also involved: (1) Considerable material and human effort is required to administer two doses of measles vaccine, one at 9 and the other at 15 months; (2) Coverage levels are approaching the 100% necessary to interrupt transmission; (3) About one third of the cases occur in infants under one year of age, when the complications of measles are most severe, and (4) About one fourth of the cases occur in schoolchildren between 5 and 14 years of age (Figure 2). Cases in the latter age group are particularly important due to the possibility of transmitting the disease to younger children.

FIGURE 2. Measles Cases treated at the Hospital del Niño, by age group, 1985



Recommendations

Based on the previous analysis, the following steps were recommended to the Ministry of Health:

1. *Take advantage of all opportunities to vaccinate susceptible children*, in the absence of formal contraindications as defined by the Vaccination Norms. This means asking systematically about the measles and vaccination histories of hospitalized children or those seeking medical care. Every susceptible child whose health status does not constitute a formal contraindication to the procedure should be vaccinated, and the fact recorded on his/her vaccination card together with precise instructions that the child is to be taken to the appropriate health center or polyclinic for vaccination followup.
2. *Encourage presentation of the vaccination card when requesting medical care at a health establishment*, as part of a campaign to promote vaccination and to support the preceding recommendation.
3. *Vaccinate all children, regardless of age, who have not been vaccinated and have not had measles*, in accordance with the Immunization Manual of the Panamanian Health Ministry.
4. *Thoroughly review the existing norms and strategies for vaccination*. As part of this review, the following recommendations are made:

4.1 *Evaluate the results of national vaccination days in terms of cost-effectiveness* (what is the average cost of each vaccination performed on a national vaccination day?) and the epidemiological impact of these days on the control of vaccine-preventable diseases. These evaluations should be done by region and by area, since the strategy might be valid in some areas and regions but not in others.

4.2 *Considering the importance of schoolchildren as a source of transmission to younger children, and given the logistical advantages of this captive population, the strategy of systematically requiring a vaccination card for school enrollment should be strengthened*. If all public and private schools throughout the country had such a requirement, in 10 years virtually all schoolchildren between 5 and 14 years of age would be vaccinated against measles, and transmission of the disease in Panama would be greatly limited.

4.3 It is important to keep in mind the future of children who are now between 5 and 14 years of age and who have not had measles or been vaccinated against it. Most will probably grow up without immunity. Later on, there may be outbreaks in universities and workplaces with serious consequences, including death.

The current epidemic yields disquieting data on the number of children with measles who are under 6 months of age. Several newborns have contracted measles within a few days of birth; some of them were born to women who had contracted measles during pregnancy. Nearly 10% of the cases treated at the Hospital del Niño were children under 6 months of age. The occurrence of measles in a normal child under the age of 6 months means that the mother had no immunity against measles. This represents a change from the situation in earlier years, when cases of measles in newborns were rare, except in Indian communities which had been shielded from measles by their isolation, so that when measles did strike, it hit adults and children alike.

Consequently, it is recommended to consider and *evaluate the strategy of mass vaccination in the schools of all schoolchildren between the ages of 5 and 14 who do not produce documentary proof of having been vaccinated against measles or of having had the disease.* Considering the benefits of vaccination, its safety, and the lower cost of the vaccine in 10-dose vials, it would be preferable to vaccinate some children who are already immune rather than to fail to vaccinate a susceptible child.

4.4 *Vaccination norms should be reviewed, particularly with regard to the age for measles vaccination.* Particularly disquieting is the possibility that revaccination has little effect on children who did not respond to the first dose. This requires a serious examination of the benefits and drawbacks of lowering the vaccination age to 6 months, despite the large number of cases in this age group. A good alternative would be to investigate how, where, and from whom infants under one year are infected, so as to direct vaccination at the sources of transmission. This would provide the protection needed by infants under one year until they reach an age at which they will be sure to respond adequately to the vaccine.

Moreover, during intervals between epidemics the risk of contracting measles for infants under one year of age is minimal, and the opportunity offered by those intervals should be used to vaccinate all children at the right age for vaccination, not at 6 months.

5. All these recommendations should be considered in light of the awareness, desires, and motivations of the community.

Source: Based on article by Dr. Claude D. Betts, *Boletín Epidemiológico*, Hospital del Niño, Republic of Panama, Vol. 1, No. 2, Nov-Dec, 1985.

Editorial note: Studies such as the one described above are useful for policy makers considering whether to recommend a different vaccination schedule in light of changing disease epidemiology. In the United States, measles vaccination is routinely performed at 15 months of age because measles infection during the first year of life is unusual, and studies have shown that vaccination at earlier ages does not yield as high a rate of seroconversion in U.S. children as it does in children from the rest of the world (1). In many African countries, on the other hand, substantial measles morbidity and mortality have been found in children younger than 9 months.

A PAHO/WHO collaborative study in several Latin American countries suggests that 90% seroconversion can be attained if initial vaccination is given at 9 to 11 months of age (2). Consequently, PAHO continues to recommend that most countries vaccinate at 9 months of age, concentrating their resources on achieving as close as possible to 100% coverage with one dose before the first birthday.

(1) Hinman, A.R., Kirby, C.D., et al. Elimination of Indigenous Measles from the United States. in *Reviews of Infectious Diseases* 5(3):5-12, May-June 1983.

(2) Ministries of Health of Brazil, Chile, Costa Rica, and Ecuador and the Pan American Health Organization. Seroconversion Rates and Measles Antibody Titers Induced by Measles Vaccination in Latin American Children 6 to 12 Months of Age. in *Reviews of Infectious Diseases* 5(3):590-605, May-June 1983.

Cold Chain Refrigerator Repair Course for Caribbean

A vaccine refrigerator repair course will be held in Puerto Rico from 8 to 26 September to train technicians from seven Caribbean countries in basic refrigeration concepts and repair techniques. The 14 participants come from Belize, Guyana, Jamaica, Saint Lucia, St. Kitts, Suriname, and Trinidad.

The course is divided into a theoretical part, covering

general concepts in refrigerator operations, and a series of practical sessions devoted to problem diagnosis and the use of tools in refrigerator maintenance and repair.

PAHO/WHO is providing funds and two course coordinators for the course, while the Puerto Rican Department of Public Instruction will provide the laboratory space, a national coordinator, and organizational support.

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	Report for week ending	Measles		Polio-myelitis§		Tetanus				Diphtheria		Whooping Cough	
						Non-neonatal		Neonatal					
		1986	1985	1986	1985	1986	1985	1986	1985	1986	1985	1986	1985
NORTHERN AMERICA													
Canada	14 Jun.	12,194	956	—	—	2**	—**	...	...	2	3	920	617
United States	09 Aug.	4,847	2,192	—	3	36**	38**	...	...	—	1	1,746	1,170
CARIBBEAN													
Antigua & Barbuda	19 Apr.	—	1	—	—	—	—	—	1	—	—	1	—
Bahamas	14 Jun.	21	16	—	—	—	4	—	—	—	—	—	1
Barbados	19 Apr.	—	1	—	—	1	—	—	—	—	—	—	—
Cuba	*	...	...	—	—	...	...	...	...	...	...	...	...
Dominica	14 Jun.	29	40	—	—	—	—	—	—	—	—	—	—
Dominican Republic	*	...	...	—	—	...	...	...	...	...	...	...	...
Grenada	14 Jun.	5	6	—	—	—	—	—	—	—	—	7	—
Haiti	*	...	...	22	70	...	...	...	...	...	...	...	...
Jamaica	25 Jan.	6	...	—	—	—	...	—	...	—	...	—	...
St. Christopher/Nevis	17 May	10	22	—	—	—	—	—	—	—	—	—	—
Saint Lucia	22 Feb.	1	3	—	—	—	—	—	—	—	—	—	—
St. Vincent and the Grenadines	*	...	...	—	—	...	...	...	...	...	...	...	...
Trinidad & Tobago	19 Apr.	1,497	...	—	—	1	...	—	...	—	...	4	...
CONTINENTAL MID AMERICA													
Belize	14 Jun.	15	4	—	—	—	2	—	—	—	—	7	28
Costa Rica	*	...	...	—	—	...	...	...	...	...	...	...	...
El Salvador	22 Feb.	38	636	—	1	5	12	3	5	—	...	63	31
Guatemala	19 Apr.	651	...	51	5	15	...	1	...	...	...	189	...
Honduras	14 Jun.	347	4,045	—	3	6	4	4	3	—	—	79	108
Mexico	*	...	...	64	83	...	...	...	...	...	...	...	...
Nicaragua	19 Apr.	668	...	—	—	...	...	...	...	—	...	115	...
Panama	*	...	...	—	—	...	...	...	...	...	...	...	...
TROPICAL SOUTH AMERICA													
Bolivia	22 Mar.	25	73	1	—	...	5	5	—	5	9	113	331
Brazil	17 May.	20,581	17,086	453	129	713	586	182	197	682	723	8,383	5,551
Colombia	*	...	...	59	11	...	...	...	...	...	...	...	...
Ecuador	17 May	333	...	—	—	...	...	29	...	10	...	449	...
Guyana	22 Feb.	2	13	—	—	1	1	...	**	—	—	—	—
Paraguay	19 Apr.	132	...	—	3	13	...	14	...	9	...	57	...
Peru	22 Feb.	7	...	34	38	—	...	3	...	1	...	14	...
Suriname	*	...	...	—	—	...	...	...	...	...	...	...	...
Venezuela	19 Apr.	4,242	10,840	2	6	—	—	—	—	—	3	859	508
TEMPERATE SOUTH AMERICA													
Argentina	22 Mar.	896	2,425	—	—	21**	29**	...	...	7	1	540	2,055
Chile	17 May.	3,387	1,471	—	—	10	12	—	—	68	47	11	539
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 34 (ending 23 August).

— No Cases

... Data not available

Third TAG Meeting to Take Place in Brasilia

The third meeting of the Technical Advisory Group on polio eradication (TAG) will take place in Brasilia on 10-12 September.

The purpose of the meeting is to review national progress to date, particularly in Brazil and Mexico, with regard to polio surveillance activities and control strategies. The group will make recommendations on the most appropriate actions which need to be taken in order to reach the polio eradication goal. In addition, they will review the draft field guide which is being prepared for distribution to all health workers involved in immunization activities.

Representatives from other international organizations involved in the polio effort—AID, Rotary, and UNICEF—as well as various experts in the field of polio control will also attend the meeting.

The TAG was created to advise PAHO on the strategies and activities needed to achieve the goal of interrupting the indigenous transmission of wild poliovirus in the American hemisphere by 1990. The group has previously met in Washington DC (July 1985) and Mexico City (June 1986).

Laboratory Course on Polio Diagnosis Scheduled for September in Rio de Janeiro

An international course on polio diagnostic tests and procedures will be held on 8-16 September at the Oswaldo Cruz Foundation (FIOCRUZ) in Rio de Janeiro. Laboratory personnel from 14 countries have been selected to attend the training. Topics covered will include virus isolation, identification methods, polio serology and other laboratory techniques related to virology.

The Pan American Health Organization is funding and

organizing the course in cooperation with the FIOCRUZ Department of Virology.

Editorial note: This course is one of the principal laboratory support activities recommended in the polio Plan of Action to develop a network of reference laboratories in the Region. The capabilities developed as a result of this training will not only serve the polio eradication effort, but will also strengthen laboratory support for other components of national immunization programs.

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