EPI Newsletter

Expanded Program on Immunization in the Americas

Volume IX, Number 3 **IMMUNIZE AND PROTECT YOUR CHILD** *June 1987*

Current Status of Poliomyelitis in the Americas Weeks 1 to 29, 1987

A provisional total of 508 cases of polio have been reported from the Region of the Americas in the first 29 weeks of 1987. A total of 651 cases were reported during the same period in 1986 and 339 in 1985. A breakdown of cases by country is provided in Table 1. Although Brazil represents 42 percent of the cases reported, it also shows the largest reduction with respect to the cases reported in 1986.

The following countries were not included in the tables and figures because they did not contribute significant numbers of cases: Argentina (2 cases, 1985), Bolivia (1 case, 1987), Canada (1 case, 1985), Dominican Republic (2 cases, 1985; 1 case 1986), Paraguay (3 cases 1985), and the USA (5 cases, 1985; 2 cases 1986).

Figure 1 shows the curves of cumulative cases reported by week for the three years. The higher curve for 1986 reflects an improvement in the surveillance and reporting systems with respect to 1985, and 1987 shows a decrease in cases reported. Nevertheless, Figure 2 shows that the majority of the countries are reporting more cases in 1987 than they did in 1986.

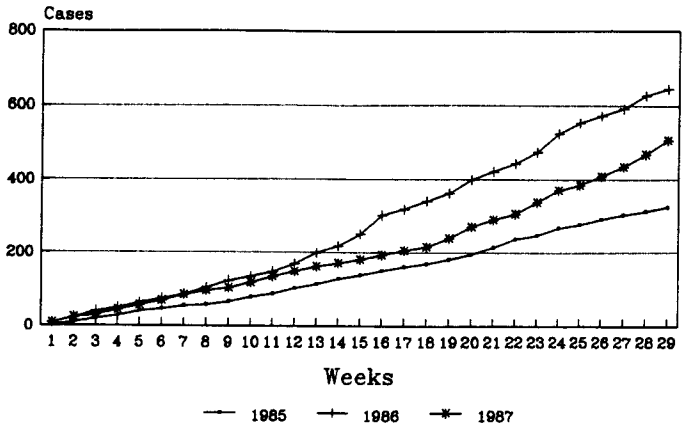
TABLE 1. Reported Polio Cases by Country Weeks 1-29, 1985-1987 Region of the Americas

Country	Cumulative Cases		
	1985	1986	1987
Brazil	112	442	211
Colombia	9	50	88
Ecuador	2	2	13
El Salvador	1	6	26
Guatemala	4	54	14
Haiti	67	20	10
Honduras	3	3	11
Mexico	90	51	76
Peru	34	19	23
Venezuela	4	1	35

Source: Weekly telexes to PAHO

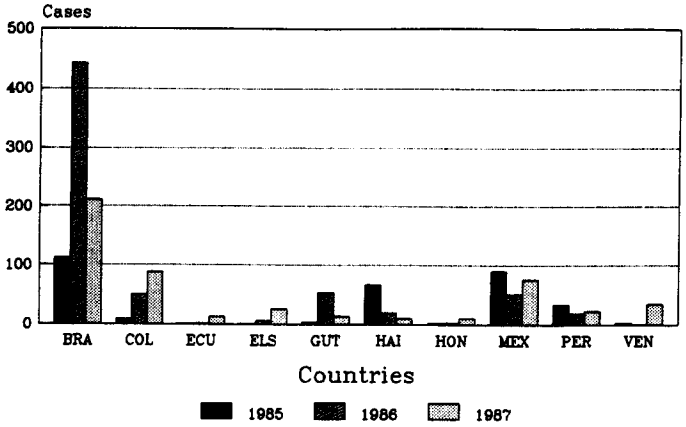
In this issue:

FIGURE 1. Cumulative Cases Reported by Week
Weeks 1-29, 1985-1987.
Region of the Americas



Source: Weekly telexes to PAHO

FIGURE 2. Polio Cases Reported by Country
Weeks 1-29, 1985-1987
Region of the Americas



Source: Weekly telexes to PAHO

Steam Sterilization in High Altitudes

The results of tests conducted with Prestige and Gruber Kaja Sterilizers in a low atmospheric pressure chamber indicate the following relationship between internal pressure and altitude:

Sterilizer:	Equivalent altitude: Mts.	Internal temperature: °C.
Prestige (1.035 bar)	0	121.0 - 124.0
	1000	118.0 - 121.0
	2000	116.5 - 120.5
	3000	113.0 - 116.0

In order to ensure inactivation of stearothermophilus spores to the EPI standard protocol it is necessary to achieve a minimum of +121°C for a total of 20 minutes, including 5 minutes venting time on high heat plus 15 minutes sterilization time on low heat. At sterilization temperatures between +115°C and 120°C the sterilization time should be prolonged to 35 minutes (5 venting + 30 sterilization).

Prestige has developed a pressure valve which has yielded the following test results:

Sterilizer:	Equivalent altitude: Mts.	Internal temperature: °C.
Prestige (1.31 bar)	0	125.0 +/-1°C
	1000	123.5 +/-1°C
	2000	122.0 +/-1°C
	2500	121.0 +/-1°C
	3000	120.4 +/-1°C
	7000	115.6 +/-1°C

This pressure valve, when used at sea level, reduces the safety factor between the operating pressure and the bursting pressure from six to five times. This ratio remains well within British and European standards for pressure sterilization vessels which call for a bursting pressure not less than three times the operating pressure.

Recommendation

At altitudes from 0 to 2,500 meters, steam sterilizers employing a 1.31 bar valve should continue to be operated on a cycle of 5 minutes venting at high heat plus 15 minutes sterilization at low heat.

At altitudes from 2,500 to 7,000 meters, steam sterilizers employing a 1.31 bar valve should be operated on a cycle of 5 minutes venting at high heat plus 30 minutes sterilization at low heat. At altitudes above 7,000 meters, the manufacturer should be consulted directly in order to produce special steam valves for these circumstances.

The sterilizers currently in the field employing a 1.035 bar valve will operate at full sterilizing performance at altitudes up to 1,000 meters. Between altitudes of 1,000 and 2,000 meters, full sterilization performance can be assured by extending the sterilization time to 5+30 minutes. At higher altitudes, the inactivation rate of the spore form of bacilli will be reduced but will be considerably better than that achieved by open boiling. This also applies to sterilization for 5+15 minutes at altitudes between 1,000 and 2,000 meters using the current sterilizers.

Collection, Storage and Shipping of Specimens for Poliovirus/Enterovirus Studies

Several types of specimens may be used in attempts to isolate polioviruses or enteroviruses. In addition, acute and convalescent sera should be obtained for serological studies. Collection of the appropriate specimens and use of the proper conditions for storage and shipping are vital to the success of laboratory studies. Specimens for viral isolation must be collected as early in the course of the illness as possible, since excretion of the infecting virus is maximal at this time. An acute serum must likewise be collected as early in the illness as possible to provide a baseline specimen before antibody levels have risen appreciably (with a convalescent serum taken at a later designated time). Autopsy specimens must be taken as soon after death as possible. Otherwise, any virus present may become non-viable because of post mortem changes in the tissues. All specimens for viral isolation must be taken with care to exclude contamination from other types of specimens or with material from other patients. Particular care must be taken to obtain autopsy specimens of tissues without contamination from the intestinal tract. Suitable containers with secure types of closures must be used for all specimens. Finally, all specimens must be clearly labelled with adequate information.

Collection of specimens

1. Feces—collect 4-8 grams in a clean, leak-proof container. Screw-capped plastic containers are very useful for this purpose. Two samples 1-2 days apart are recommended.
2. Rectal swabs—insert a moistened, sterile swab well into the rectum and rub the mucosa until fecal material adheres to the swab. Place the swab in a tube containing 1-2 ml of virus transport medium.
3. Throat swabs—rub the posterior pharynx well with 1 or 2 sterile swabs. Place the swab(s) in a tube containing 1-2 ml of virus transport medium.
4. Cerebrospinal fluid (CSF)—collect 3-5 ml of CSF aseptically into a sterile tube.
5. Autopsy specimens—take specimens from the central nervous system first. Samples of medulla, pons, cervical and lumbar spinal cord should be collected with separate sets of sterile instruments and placed in separate sterile containers (for example, 1 ounce, screw-capped jars). Obtain a portion of the descending colon with fecal contents last and place in a screw-capped plastic container as used for stools.
6. Acute and convalescent blood—collect 5-10 ml of venous blood aseptically and place in a sterile tube without anticoagulants. The convalescent sample should be collected 3-4 weeks after the acute specimen.

Storage and handling of specimens

1. All specimens for viral isolation studies should be stored frozen (-20°C or lower) until they are sent to the testing laboratory. If the specimens are to be hand-carried to the laboratory on the day of collection, they may be placed in a refrigerator at 4°C or in an insulated container with wet ice awaiting transportation to the laboratory.
2. Blood samples should be allowed to clot at room temperature for 1-2 hours. If possible, after clotting, centrifuge the blood at 1,500 rpm in a refrigerated centrifuge for 15 minutes to separate the clot from the serum. Remove the serum to a sterile vial with a sterile capillary pipette. If a centrifuge is not available, serum can be carefully removed with a sterile capillary pipette after retraction of the clot. Care must be used in separation of the serum to avoid mixture with red blood cells. Residual red cells would hemolyze during later storage and could interfere with serological tests. It is necessary that aseptic technique and sterile glassware be used in drawing the blood and separating the serum. Bacterial or fungal contamination of the serum can destroy antibodies and interfere with both the neutralization and complement fixation tests. The serum should be frozen at -20°C until it can be sent to the testing laboratory.

Shipment of specimens

1. Specimens for both isolation and serological studies should be shipped to the testing laboratory frozen with dry ice.
2. All containers must be tightly closed with the caps held securely in place by a piece of adhesive tape.
3. Each type of specimen should be placed in a well-sealed plastic bag to prevent contamination of other specimens if leakage should occur. It is advisable to wrap the individual tubes in a piece of paper towel or similar material held in place by tape to provide protection against breakage.
4. All specimens should be placed in an insulated box with sufficient dry ice to maintain the specimens frozen during shipment. Allow 2.5 kilograms (5 pounds) for every 24 hours of transit time.
5. Fill any remaining space in the box with crumpled newspapers or similar material to serve as further padding for the specimens.
6. If dry ice is not available, the specimens must be shipped with wet ice (or possibly frozen "cold packs").

Wet ice must be placed in a separate, well-sealed plastic bag to prevent leakage of water into the box. Specimens again should be placed in well-sealed plastic bags. This serves both to prevent contamination of other specimens should leakage occur and to prevent seepage of water into the specimens if the ice bag leaks. Extra care must be taken to be sure that the caps of all specimen containers are tight and securely held in place with tape, since the specimens will be in the fluid state during shipment and subject to leakage.

7. Serum specimens may be placed in sterile vaccine-type containers with rubber caps, if such containers are available. Caps should be held in place with adhesive tape.
8. The receiving laboratory should be notified of the arrival time of the shipment, the flight number and the airline. It is desirable for the receiving laboratory to confirm receipt of the specimens with the sender.
9. All specimen containers must be clearly labelled with the name of the patient, the type of specimen, and the date of collection. Adhesive tape serves well for this purpose. The label should be printed with a marking device such that the printing remains legible even if it becomes wet.
10. After receipt in the testing laboratory, all specimens should be stored frozen (-20°C or lower) until they are tested. CSF and autopsy specimens should be stored frozen at -70°C if possible.

Eleven Plans of Action Approved

The national plan of action is the basic instrument of coordination between the governments, the Inter-agency Coordinating Committee (ICC) and the other agencies which support EPI and polio eradication (see EPI Newsletter, Vol IX, No. 1). Eleven plans have been reviewed and approved in the first half of 1987.

The table below shows a breakdown of the external and national funds which have been preliminarily committed in support of the implementation of the national plan of action for each country.

EPI FINANCIAL SUMMARY BY COUNTRY*
1987 - 1991

COUNTRY	EXTERNAL FUNDS										NATIONAL FUNDS		TOTAL
	PAHO[1]				USAID	ROTARY	UNICEF	OTHER	TOTAL	%	TOTAL	%	
	REG	AID	IDB	TOTAL									
Bolivia	198.0	189.8	159.0	546.8	4 240.7	223.0	1 231.0	0.0	6 241.5	50.0	6 497.0	50.0	12 738.5
Colombia	122.0	410.0	110.0	642.0	100.0	762.0	712.3	0.0	2 216.3	23.0	7 377.6	77.0	9 593.9
Costa Rica	82.0	345.8	104.5	532.3	0.0	170.5	369.5	0.0	1 072.3	10.0	8 776.5	90.0	9 848.8
Dominican Rep.	74.5	562.0	229.0	865.5	700.0	492.0	879.4	850.0[2]	3 786.9	30.0	10 581.8	70.0	14 368.7
Ecuador	23.5	393.8	225.5	642.8	1 437.2	392.0	224.5	0.0	2 696.5	20.0	12 070.8	80.0	14 767.3
El Salvador	134.0	892.7	175.5	1 202.2	1 250.5	413.0	1 655.0	0.0	4 520.7	20.0	16 089.7	80.0	20 610.4
Guatemala	153.0	961.8	271.0	1 385.8	4 883.0	149.0	1 853.1	0.0	8 270.9	40.0	14 692.9	60.0	22 963.8
Haiti	653.7	318.0	214.7	1 186.4	1 321.7	859.6	1 798.6	102.0[3]	5 268.3	46.0	6 299.6[4]	54.0	11 567.9
Honduras	121.4	996.2	328.5	1 446.1	3 773.5	433.4	1 119.9	0.0	6 772.9	30.0	19 760.0	70.0	26 532.9
Jamaica	120.9	112.7	60.0	293.6	0.0	72.0	402.3	300.0[3]	1 067.9	7.0	14 249.1	93.0	15 317.0
Peru	153.0	220.0	211.0	584.0	3 663.0	854.0	594.0	0.0	5 695.0	30.0	13 389.0	70.0	19 084.0
TOTAL	1 836	5 403	2 089	9 327.5	21 369.6	4 820.5	10 839.6	1 252.0	47 609.2		129 784.0		177 393.2

* Provisional data
1 Includes regular budget and grants with AID and IDB
2 IDB-680
3 CIDA
4 Title III: 1,875.7
Source: National Plans of Action

Outbreak of Poliomyelitis in Ecuador

Background

The incidence of poliomyelitis in Ecuador during the period 1972-1985 showed such a marked downward trend that during 1984 and 1985 not a single case was reported through the regular epidemiological surveillance system (Figure 1). This situation remained unchanged during the first eight months of 1986.

Although this situation could be attributed to a gradual but slow increase in vaccination coverages in children under one year, the fact that coverage fluctuated around 40% of these children with three doses raised fears of a recrudescence of the disease due to reactivation of the wild poliovirus. Moreover, cases of paralytic poliomyelitis may have occurred in the country in recent years that were not reported owing to underreporting of notifiable communicable diseases in general. This assertion is supported by the fact that neighboring countries such as Colombia and Peru reported a large number of cases during the two years in which Ecuador reported none.

In 1986, Ecuador made a commitment as a member of the Pan American Health Organization to eradicate the transmission of wild poliovirus by 1990. The recommendation was made that the provincial health directorates strengthen their activities for the epidemiological surveillance of polio while increasing overall vaccination coverages so that all suspected cases could be reported promptly —an essential prerequisite for attaining the erradication goal.

As can be seen in Figure 2, the third dose coverage of children under one year rose gradually from less than 10% in 1978 to 43% in 1986.

There is also wide disparity between the coverages of the first, second and especially the third doses, which persists throughout the period considered. In 1986 this drop-out rate reached 50%, one of the highest in Latin America.

Analysis of cumulative coverages in children shows that as of 31 December 1986, 77% of children from one to four years of age had received three doses of polio vaccine.

Epidemiological Investigation of the Outbreak

Suspected new cases of poliomyelitis began to be reported from the city of Guayaquil in September 1986. These cases were reported just a few weeks after the National Directorate for Epidemiological Control and Surveillance began to strengthen its activities for the detection and prompt reporting of all suspected cases of paralytic poliomyelitis from the provinces.

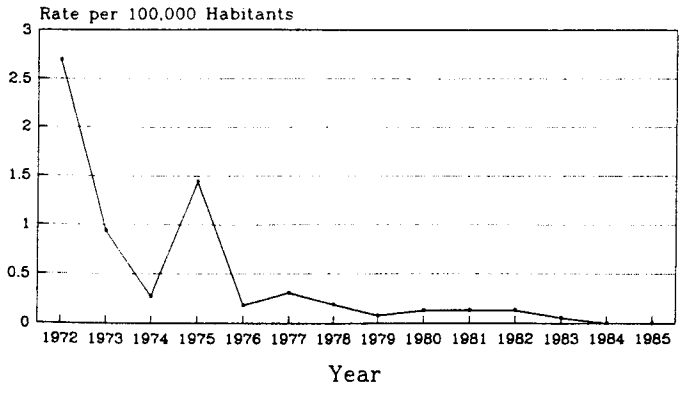
Upon the detection, case histories were immediately taken, and cases were followed-up until they could be confirmed or discarded using the epidemiological investigation form.

The provincial teams followed the appropriate control measures in all probable cases (search, identification and control of contacts, containment vaccinations, etc.). In the cities of Guayaquil (Tarqui and Ximena parishes), Quevedo and Riobamba, these control measures included mass polio vaccination campaigns for children under five years.

Laboratory confirmation tests were carried out in the Leopoldo Izquieta Perez National Health Institute in Guayaquil, which analyzes samples of all probable cases occurring in the provinces.

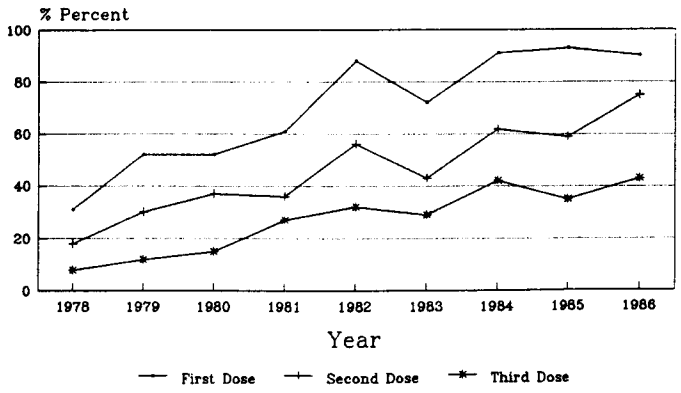
On the basis of clinical and laboratory criteria, 20 cases had been confirmed as of 31 December 1986: 10 by the presence of sequelae and 10 by laboratory examination

FIGURE 1. Poliomyelitis Incidence
Ecuador 1972-1985



Source: National Directorate for Epidemiological Surveillance and Control, Ecuador

FIGURE 2. Coverage with Polio Vaccine
in Children under One Year of Age
Ecuador 1978-1986



Source: National Directorate for Epidemiological Surveillance and Control, Ecuador

(which also presented residual paralysis); seropositive findings could be obtained in only two of the latter cases.

The 20 cases occurred between August and December of 1986. It is important to note that of the 10 cases confirmed by laboratory examination, nine corresponded to poliovirus type 3 and only one to poliovirus type 1. In the first case, which could be considered as the "index case," the symptoms began on 24 August 1986 (the 35th week). The first five cases ocurred between the 35th and 38th weeks, the following eight between the 43rd and 46th weeks, and five from the 49th to the 51st week. The only cases of polio reported from the provinces of Pichincha and Cañar ocurred in weeks 40 and 53.

The cases were distributed among five provinces, the largest number occurring in the province of Guayas (11 or 55% of the total) followed by four cases in Los Ríos (20%) and three in Chimborazo (15%). Pichincha and Cañar had one case each.

Twelve cases (60%), occurred in urban-fringe areas, while four occurred in urban areas and four in rural areas.

Eighty-five percent of cases were in children under five years of age, of which seven occurred in children under one year and 10 in children one to four years. Thus incidence was highest among children under one year with a rate of 2.34 per 100,000, followed by those between one and four years of age, with a rate of 0.82 per 100,000 inhabitants (Table 1).

Sixty percent (12 cases) were female, 40% (8 cases) male.

Cases According to Vaccination Status

Seven of the cases (35%) had not received any doses of polio vaccine. The vaccination status of eight patients (40%) is unknown; and five cases (25%) had received a complete series of shots, including in one case a booster shot. It was not possible to obtain data on the quality of vaccine used.

TABLE 1. Distribution of Confirmed Poliomyelitis Cases and Incidence Rates by Age Group Ecuador 1986

AGE GROUPS	No. Cases	%	Rate per 100,000
Less than 1 year	7	35	2.34
1 - 4 Years	10	50	0.82
5 - 9 Years	1	5	0.07
10-14 Years	2	10	0.16
TOTAL	20	100	0.2

Source: National Directorate for Epidemiological Surveillance and Control, Ecuador

Conclusions

1. In the epidemiological study it was established that the largest number of cases occured in the province of Guayas and the highest incidence in that of Chimborazo.
2. The age group at highest risk was that of infants under one year.
3. It was also determined that most cases were from urban-fringe areas, where there are numerous squatter settlements without any basic sanitation facilities, where poor conditions have been worsened due to seasonal floods.
4. Five cases (25%) had received a complete series of vaccinations.
5. Of the 10 cases confirmed by laboratory examination, nine corresponded to poliovirus type 3.
6. The start of the outbreak is consistent with low OPV vaccination coverages in children under one year of age. Although coverages in children one to four are relatively high, they are being achieved too late, for according to the data analyzed the group at greatest risk is that of infants under one year.

Recommendations

1. Define critical areas through analyses of vaccination coverages on a parish-by-parish basis in every province of the country in order to strengthen immunization activities both in routine services and in campaigns.
2. Allocate vaccination resources preferentially so as to obtain coverages above 90% in infants under one year.
3. Strengthen epidemiological surveillance activities, particularly in the provinces at greatest epidemiological risk.
4. Test the quality and potency of the polio vaccine at all levels in order to detect shortcomings in its preservation.
5. Periodic supervision of the cold chain, particularly at the operational level.
6. Investigate the causes of the emergence of poliovirus type 3 in 90% of the laboratory-diagnosed cases.

Source: Ministry of Public Health, Quito, Ecuador
April 1987

Reported Cases of EPI Diseases

Number of reported cases of measles, poliomyelitis, tetanus, diphtheria and whooping cough, from 1 January 1987 to date of last report, and for same epidemiological period in 1986, by country

Subregion and Country	Date of last report	Measles		Polio-myelitis§		Tetanus				Diphtheria		Whooping Cough	
						Non-neonatal		Neonatal					
		1987	1986	1987	1986	1987	1986	1987	1986	1987	1986	1987	1986
NORTHERN AMERICA													
Canada	09 May	1 386	9 948	—	—	1**	2**	...	...	1	—	431	797
United States	25 Jul.	2 901	4 666	—	—	19**	21**	...	...	1	—	998	1 517
CARIBBEAN													
Antigua & Barbuda	28 Mar.	—	—	—	—	—**	—	—	—	—	—	—	—
Bahamas	18 Jul.	25	24	—	—	—**	—	—	—	—	—	—	—
Barbados	25 Apr.	2	—	—	—	—	1	—	—	—	—	—	—
Cuba	28 Mar.	349	897	—	—	3	2**	—	...	—	—	24	89
Dominica	20 Jun.	72	29	—	—	—	—	—	—	—	—	—	—
Dominican Republic	28 Mar.	99	241	—	1	16**	18	...	5	23	20	22	74
Grenada	18 Jul.	4	3	—	—	—	—	—	—	—	—	1	7
Haiti	*	...	...	10	20	...	...	...	...	...	...	...	...
Jamaica	*	...	...	—	—	...	...	...	...	...	...	...	...
St. Christopher/Nevis	*	...	...	—	—	...	...	...	...	...	...	...	...
Saint Lucia	31 Jan.	1	—	—	—	—	—	—	—	—	—	—	—
St. Vincent and the Grenadines	*	...	...	—	—	...	...	...	...	...	...	...	...
Trinidad & Tobago	25 Apr.	184	1 497	—	—	3	1	—	—	—	—	5	4
CONTINENTAL MID AMERICA													
Belize	18 Jul.	194	...	—	—	—	...	—	...	1	...	—	...
Costa Rica	25 Apr.	2 202	5	—	—	—	1**	—	...	...	—	35	28
El Salvador	28 Feb.	19	36	26	6	...	5	1	2	—	—	14	71
Guatemala	28 Feb.	33	...	14	54	...	...	...	...	...	...	23	...
Honduras	25 Apr.	81	286	11	3	9	2	2	4	—	—	93	33
Mexico	31 Jan.	65	403	76	51	15	...	...	...	15	—	134	35
Nicaragua	28 Feb.	163	425	—	—	...	...	1	5	—	—	19	84
Panama	28 Mar.	1 037	1 509	—	—	1	2	1	—	—	—	4	14
TROPICAL SOUTH AMERICA													
Bolivia	*	...	...	1	—	...	...	...	...	...	...	...	...
Brazil	25 Apr.	23 135	15 829	211	442	470	510	118	128	390	404	6 161	5 448
Colombia	*	...	...	88	50	...	...	...	...	...	...	...	...
Ecuador	02 Jan.	839	...	13	2	88	...	74	...	11	...	907	...
Guyana	*	...	...	—	—	...	...	...	...	...	...	...	...
Paraguay	28 Mar.	64	116	—	—	12	12	6	12	7	4	48	50
Peru	25 Apr.	375	...	23	19	8	...	12	...	1	...	314	...
Suriname	28 Mar.	—	20	—	—	—	—	—	...	—	—	—	—
Venezuela	25 Apr.	8 072	4 242	35	1	—	1	3	...	—	1	304	859
TEMPERATE SOUTH AMERICA													
Argentina	31 Jan.	398	304	—	—	9**	5**	...	...	—	—	135	261
Chile	20 Jun.	889	4 081	—	—	7	12	2	—	78	111	13	15
Uruguay	*	...	...	—	—	...	...	...	...	...	...	...	...

* No 1987 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 29 (ending 25 July 1987).

— No cases

... Data not available

NATIONAL VACCINATION CAMPAIGNS CARRIED OUT AND PLANNED FOR 1987

	MONTHS											
COUNTRY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Bolivia				12		12			4			
Brazil		21			23			15			14	
Colombia							25		26		9-14[a]	
Dominican Republic					22-30		21-25[b]				20-24[c]	
Ecuador						7		2		*[d]		
El Salvador		1	1	3								
Guatemala												
Honduras				25						9		
Mexico	24[e]		28[e]							*d,f		
Nicaragua		14-15		4-5	16-17							
Paraguay									26	7		
Peru									6	25		
Venezuela		9-13		27 to 8		15-19						

[a] Accelerated activities.
[b] Polio and DPT (<2 years).
[c] Measles (<2 years).
[d] Each province will determine a particular date.
[e] Polio and DPT.
[f] Measles.

Source: Telexes to PAHO.

The *EPI Newsletter* is published every two months, in English and Spanish, by the Expanded Program on Immunization (EPI) of the Pan American Health Organization (PAHO), Regional Office for the Americas of the World Health Organization (WHO). Its purpose is to facilitate the exchange of ideas and information concerning immunization programs in the Region in order to promote greater knowledge of the problems faced and their possible solutions.

Editor: Ciro de Quadros
Assistant Editors: Roxane Moncayo Eikhof
Peter Carrasco

Contributor to this issue: Linda Lloyd

ISSN 0251-4710

Expanded Program on Immunization
Maternal and Child Health Program
Pan American Health Organization
525 Twenty-third Street, N.W.
Washington, D.C. 20037
U.S.A.