

EPI Newsletter

Expanded Program on Immunization in the Americas

Volume III, Number 5

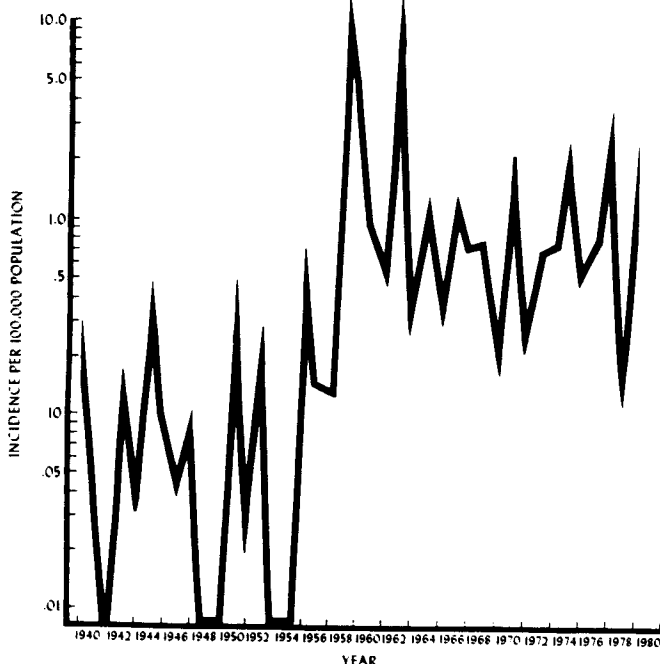
IMMUNIZE AND PROTECT YOUR CHILD

October 1981

Review of Poliomyelitis in the Dominican Republic: 1940-1981

National surveillance of the number of cases of poliomyelitis in the Dominican Republic began in 1940. During the period 1940-1958, sporadic cases were reported to the Ministry of Health, with annual incidences ranging from 0 to 0.68 per 100,000 population, with a mean incidence of 0.16 cases (± 0.198). The first major epidemic was reported in 1959 and involved 315 cases (10.71 cases per 100,000 population). Since 1959, epidemics have occurred in cycles of 2-5 years (Figure 1) with the most recent epidemics occurring in 1975, 1978 and 1980-81.

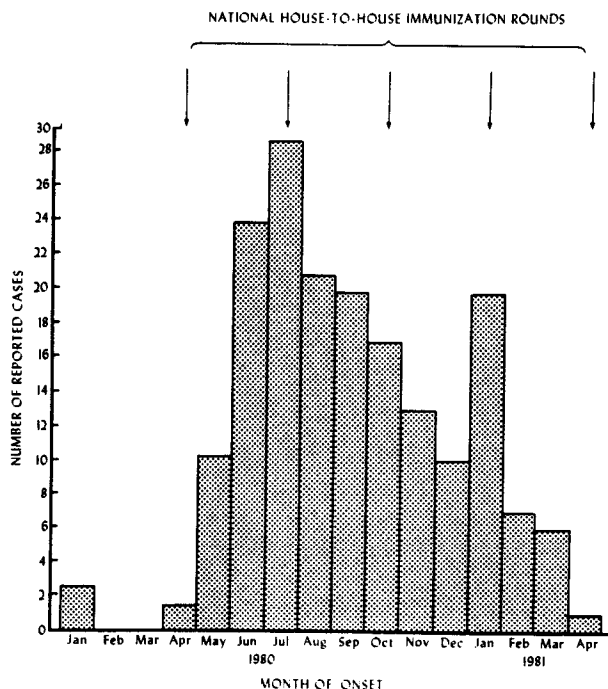
FIGURE 1. Annual incidence of poliomyelitis per 100,000 population. Dominican Republic, 1940-1980.



In May 1980 the Division of Epidemiology of the Ministry of Health in Santo Domingo received the first reports of probable epidemic activity of poliomyelitis among residents of Azua in health region 1. In June 1980 cases were reported from the capital city, Santo Domingo

(health region 0). Cases continued to occur through April 1981. Figures 2 and 3 show the monthly occurrences of cases (by date of onset), countrywide and by health region of residence. During the period January 1980-April

FIGURE 2. Number of cases of poliomyelitis reported, by month of onset, in relation to house-to-house immunization rounds. Dominican Republic, January 1980-April 1981.

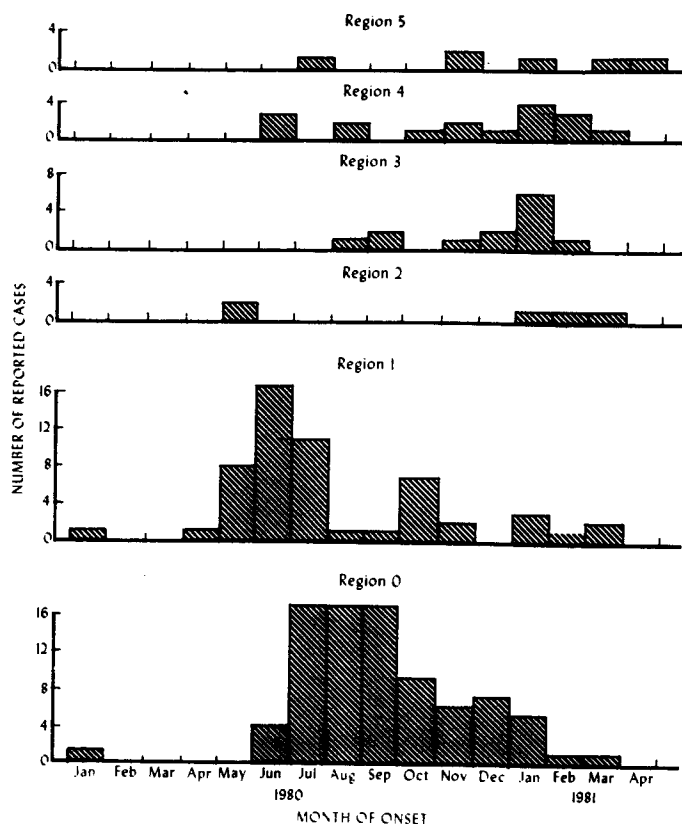


Contents

• Review of Poliomyelitis in the Dominican Republic: 1940-1981	1
• The Epidemiology of Measles in the State of Rio Grande do Sul, Brazil	3
• EPI Vaccination Coverage and Reported Cases, 1980	5
• Retesting of Vaccines: Update to EPI Manual of Operations	6
• Rotary International Support to EPI in Bolivia and Haiti	6
• Reported Cases of EPI Diseases	7
• World Congress on Health Information Systems and the Developing Countries	8
• Cuban Contribution to the EPI Revolving Fund	8

1981, there were reports of 181 cases, including 7 deaths (case-fatality rate 3.9 percent).

FIGURE 3. Number of cases of poliomyelitis reported, by month of onset and health region of residence. Dominican Republic, January 1980–April 1981.



Of 30 stool specimens tested,¹ 13 were positive for poliovirus (type 1 poliovirus was isolated from twelve specimens and a mixture of types 1 and 2 was isolated from one specimen); ECHO virus was isolated from nine (three were ECHO virus type 1, three were ECHO virus type 13, one was ECHO virus type 17, one was ECHO virus type 6, and one was an ECHO virus for which type information was not available); two viruses which could not be typed were isolated; and no viruses were isolated from six specimens. Seven of the twelve poliovirus type 1 isolates were tested for antigenic characterization: all were non-vaccinelike by either the modified Wecker or Van Wezel antigenic characterization methods.

The male to female ratio of cases was 1.3:1. Cases ranged in age from 2 months to 6.5 years, with a mean age of 15.0 months (± 10.44) and a median age of 12 months. Table 1 shows the age distribution and age-specific attack rates of the cases. While 88.4 percent of the cases occurred in children less than 2 years of age, the highest attack rate was seen among children 6–11 months

of age. Intervals between the dates of onset and the dates of report to the Ministry of Health ranged from 0–116 days with a mean interval of 14.9 days (± 14.66) and a median interval of 11 days.

TABLE 1. Age distribution and age-specific attack rates per 10,000 population of poliomyelitis cases. Dominican Republic, 1980–1981.^a

Age	Number of cases	% of total cases	Attack rate per 10,000 population ^b
less than 6 months	19	10.5	2.06 ^c
6–11 months	54	29.8	5.85 ^c
1 year	87	48.1	
2 years	13	7.2	
3 years	3	1.7	
4 years	3	1.7	
5–9 years	2	1.1	0.02
Total	181	100.1	1.00 ^c

^aCases reported through May 1981.

^bUses 1980 population projections supplied by the Division of Statistics, Ministry of Health, based on the 1970 census.

^cAssumes that 50% of the population is less than 1 year of age and 50% is between 6–11 months of age.

^dPopulation estimates available only for age group 1–4 years.

^eFor population 0–9 years of age.

Immunization histories were known for 176 (97.2 percent) cases: 81 (44.8 percent) had never received any doses of polio vaccine, 68 (37.6 percent) had received one dose, 18 (9.9 percent) had received two doses and 9 (5.0 percent) had received three doses.

In 1979 a decision was made to change the immunization program strategy to primarily house-to-house vaccination rounds every three months. By April 1980 three health regions had implemented the house-to-house strategy, and by July 1980 all health regions were conducting house-to-house rounds.

Table 2 shows the annual coverage of the less than 1-year old population with polio vaccine, by number of doses received, from 1978 to 1981. During this period the coverage of the less than 1-year old population with three doses of polio vaccine has doubled. The dropout rate has decreased by 40 percent.

TABLE 2. Annual number of children less than 1 year of age receiving first, second and third doses of polio vaccine, and dropout rate.^a Dominican Republic, 1978–1981.

Year	Est. pop. less than 1 yr. old ^b	1st dose		2nd dose		3rd dose		% Dropout
		No.	%	No.	%	No.	%	
1978	185,161	303,155	163.1	176,372	94.9	47,404	25.5	84.4
1979	179,364	147,801	82.4	106,552	59.4	63,385	35.3	57.1
1980	184,650	199,381	108.0	146,119	79.1	85,160	46.1	57.3
1981 ^c	192,995	49,990	103.6 ^d	33,217	68.8	24,662	51.1	50.7

^aDropout rate is the percentage difference between the number of children receiving a first and third dose of vaccine.

^bPopulations estimated are projections from the 1970 census.

^cVaccine administration data available through March 1981.

^dUses 25% of annual estimated population.

¹Enterovirus Reference Laboratory, Centers for Disease Control (CDC), Atlanta, Georgia, USA.

Editorial note: Poliomyelitis continues to be a major health problem in the Americas.² Susceptibility to the poliovirus is universal among unvaccinated individuals. In developing countries where coverage of the childhood population with three doses of polio vaccine is low, most children have been exposed to poliovirus by 5 years of age. This is illustrated by the age distribution of the polio cases in the Dominican Republic in 1980-81, which shows that 88.4 percent of the reported cases occurred in children who were born after the 1978 epidemic (and thus were less than 2 years of age), and only 1.1 percent of the reported cases occurred in individuals who were over 5 years of age.

Table 3 shows the number of doses of vaccine administered in the Dominican Republic in 1980 and 1981, by age of recipient. It should be noted that, while the highest attack rates were seen in the less than 1-year old population, only 31.2 percent of the vaccine administered was given to this population.

TABLE 3. Total number of doses of polio vaccine administered, by age group of recipients. Dominican Republic. 1980 and 1981.

Age group (in years)	1980		1981		Total	
	No. of doses adminis- tered	% of total doses	No. of doses adminis- tered	% of total doses	No. of doses adminis- tered	% of total doses
less than 1	430,660	30.9	107,869	32.4	538,529	31.2
1-4 years	683,897	49.1	160,237	48.1	844,134	48.9
5 or more	278,285	20.0	65,217	19.6	343,502	19.9
Total	1,392,842		333,323	100.1	1,726,125	100.0

Using the formula for determining vaccine efficacy:³

$$\text{Vaccine efficacy} = \frac{\text{Attack rate in unvaccinated} - \text{Attack rate in vaccinated}}{\text{Attack rate in unvaccinated}} \times 100\%$$

and the vaccination coverage data (Table 2), it can be calculated that the efficacy of three doses of polio vaccine in the less than 1-year old population in the Dominican Republic during the epidemic in 1980-1981 was 96 percent. This data supports the recommendation that booster doses of polio vaccine are not necessary, as 96 percent of children receiving three doses of polio vaccine are protected against paralytic disease during an epidemic of polio.

The attack rates among vaccinated and unvaccinated

children less than 1 year of age were calculated using the data shown in Table 4.

TABLE 4. Vaccination histories of children less than 1 year old with paralytic poliomyelitis. Dominican Republic, January 1980-March 1981.

Number of doses of vaccine received	Number of children with poliomyelitis
0	27
1	24
2	5
3	2
Total	58

The less than 1-year old population vaccinated with three doses of polio vaccine was obtained by the following formula, using the vaccine coverage data in Table 2:

$$\text{Population vaccinated} = 0.791 \left(\frac{\text{1980 population}}{\text{population}} \right) + 0.688 \left(\frac{\text{1981 population}}{4} \right)$$

The Epidemiology of Measles in the State of Rio Grande do Sul, Brazil

The incidence of measles in Rio Grande do Sul over the last decade is illustrated in Figure 1. The effectiveness of the case-reporting system may be judged from the parallelism between the curves for incidence and mortality in recent years.

Regular measles vaccination in the health units of the Secretariat for Health and the Environment began in 1973. The launching of this activity was followed by a sharp drop in the number of cases. Today, however, despite coverages of about 80 percent in many municipalities, incidence remains high.

In 1980, 12,424 cases were notified, an increase of 19.25 percent over the previous year, but still short of the epidemic threshold calculated for the period.

Mortality rates, while keeping pace with the trend of morbidity, definitely account for only part of all the deaths from measles. Many of these deaths are still reported as resulting from one or another of the complications of the disease—bronchopneumonia, encephalitis, etc.—which shows that more care must be taken to fill out death certificates correctly.

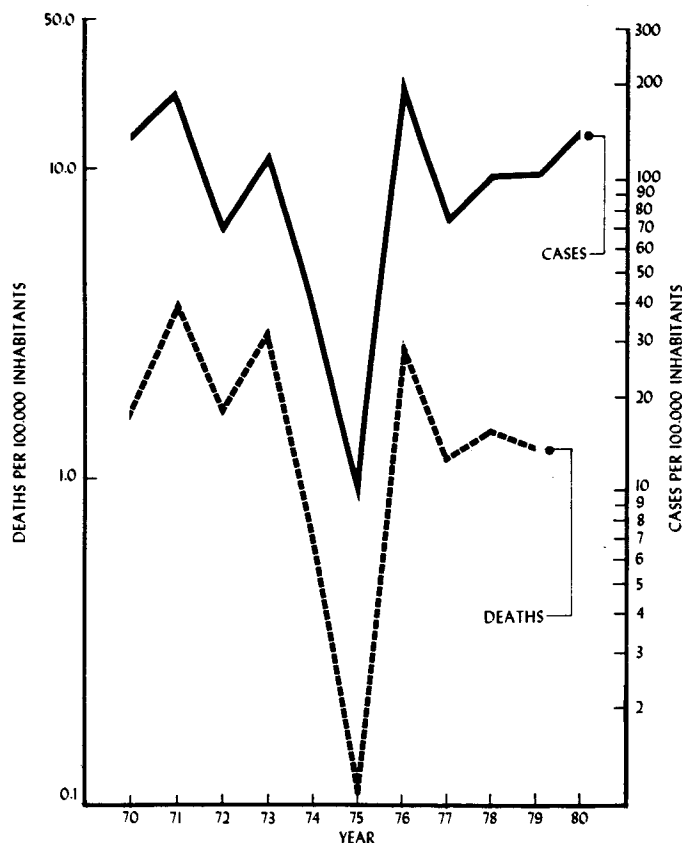
Seasonal variation

Cases of measles can turn up at any time of the year, but epidemics usually break out at the end of winter. In Figure 2, which shows the distribution of cases in Rio Grande do Sul by month of onset, it can be seen that these numbers peak during the months of late winter and early spring.

²See "Poliomyelitis: Honduras, 1979" and "Poliomyelitis: Venezuela, 1979" in *EPI Newsletter* II-6 (December 1980); "Control of Poliomyelitis in Brazil" in *EPI Newsletter* III-1 (February 1981); and "Poliomyelitis: Cuba, 1962-1978" in *EPI Newsletter* III-2 (April 1981).

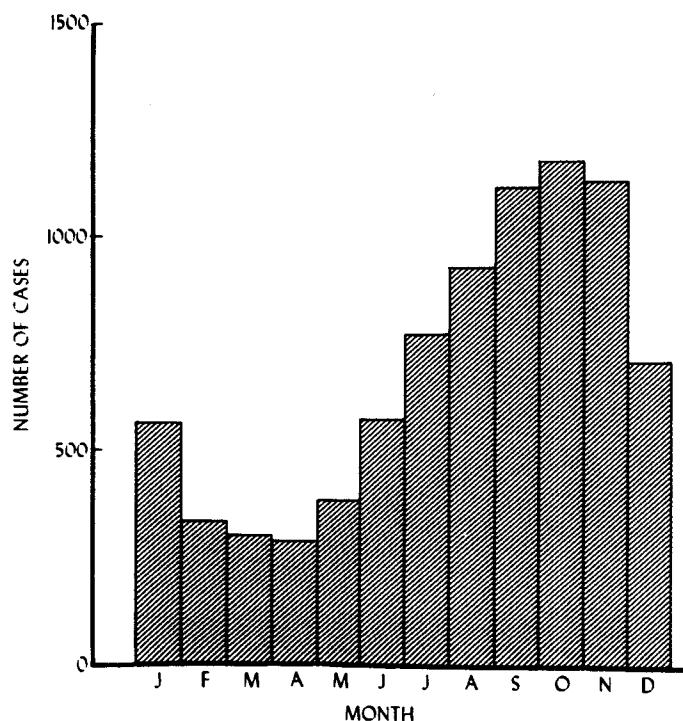
³See "Measles Vaccine Efficacy: United States" in *EPI Newsletter* II-6 (December 1980).

FIGURE 1. Rates of incidence (per 100,000 population) and mortality from measles. Rio Grande do Sul, Brazil, 1970-80.



Source: Epidemiological Surveillance Unit, SSMA.

FIGURE 2. Mean number of measles cases, by month of onset. Rio Grande do Sul, Brazil, 1975-80.



Source: Epidemiological Surveillance Unit, SSMA.

Age distribution

An analysis of the age distribution of measles cases in two different periods (1974-77 and 1978-80) shows that the incidence was highest among children under 5 years old and, within this group, the risk of contracting the disease was high in the age subgroup of children from 6 to 12 months old. This risk decreased with increasing age (Table 1).

TABLE 1. Measles incidence per 100,000 inhabitants, by age group. Rio Grande do Sul, 1974-77 and 1978-80 (mean for period).

Age group	Mean number of cases		Mean incidence	
	1974-77	1978-80	1974-77	1978-80
0-5 months	128	196	136.5	194.3
6-8 months	269	424	563.2	837.3
9-11 months	251	368	546.2	726.7
less than 1 year	648	989	345.7	488.1
1-4 years	2,736	3,564	351.7	423.4
5-9 years	1,514	2,096	148.4	189.6
10-14 years	726	1,077	76.7	104.8
15 years and older	491	978	10.7	19.5
Total	6,121	8,705	81.1	106.4

Source: Epidemiological Surveillance Unit, SSMA.

It can be seen that in each of the two periods considered, more than half of the cases—53.3 percent in 1974-77 and 52.3 percent in 1978-80—were of children under 5 years of age, which makes this group the priority target population in any intensive vaccination effort (Table 2).

TABLE 2. Mean number of measles cases and percentage distribution, by age group. Rio Grande do Sul, 1974-77 and 1978-80.

Age group	1974-77			1978-80		
	Mean no. of cases	%	Cumul. %	Mean no. of cases	%	Cumul. %
0-11 months	648	10.6	10.6	939	11.4	11.4
1-4 years	2,736	44.7	53.3	3,564	40.9	52.3
5-9 years	1,514	24.7	80.0	2,096	24.1	76.4
10-14 years	726	11.9	91.9	1,077	12.4	88.8
15 years and older	491	8.1	100.0	978	11.2	100.0
Total	6,121	100.0	—	8,705	100.0	—

Source: Epidemiological Surveillance Unit, SSMA.

**VACCINATION COVERAGE AND REPORTED CASES OF DIPHTHERIA, WHOOPING COUGH, TETANUS,
MEASLES AND POLIOMYELITIS, PER 100,000 POPULATION (PROVISIONAL DATA).**

REGION OF THE AMERICAS, 1980.

Country	Est. pop. under 1 year of age	Coverage (%) of children under 1 year of age						Coverage (%) of pregnant women		Reported cases per 100,000 population				
		BCG	DPT		Measles	Poliomyelitis		Tetanus Toxoid		Diph- theria	Whooping cough	Tetanus	Measles	Polio- myelitis
			1st dose	3rd dose		1st dose	3rd dose	1st dose	2nd dose					
Argentina	674,000	64	68	42	60	...	96	...	...	0.3	100.6	0.8	59.6	0.1
Bahamas	5,400	71	72	40	...	72	38	...	...	—	6.3	1.3	204.2	—
Barbados	4,200	...	...	60	...	...	57	...	...	4.4	—	5.2	10.8	—
Bolivia	103,380	49	64	20	23	73	25	...	...	0.6	42.4	3.2	63.9	0.9
Brazil	3,582,640	58	...	40	58	...	...	...	...	3.7	36.0	2.6	78.0	1.1
Canada	372,000	...	...	...	...	...	...	...	...	0.3	11.7	0.0	55.8	—
Chile	243,000	99	100	85	88	98	80	...	...	2.2	26.4	0.3	35.5	—
Colombia	765,000	40	37	15	11	38	15	3	2	1.0	28.2	2.2	33.9	0.4
Costa Rica	72,000	79	88	67	68	87	65	...	...	—	43.2	0.4	44.9	—
Cuba	136,900	99	78	67	48	...	...	...	...	—	1.3	0.3	39.7	—
Dominica	2,600	...	...	63	...	...	53	...	...	—	1.3	2.5	—	—
Dominican Rep.	184,650	12	91	36	29	...	46	85	...	3.4	10.3	1.7	179.7	2.7
Ecuador	327,950	74	34	21	67	37	11	4	2	0.2	10.0	1.3	32.6	0.1
El Salvador	188,033	56	57	43	44	55	42	30	26	0.0	22.0	2.2	49.3	1.2
Grenada	2,700	...	...	25	...	...	32	...	...	0.9	5.5	2.7	48.2	—
Guatemala	246,994	43	59	43	...	59	43	...	...	0.1	21.3	0.8	36.9	0.9
Guyana	23,000	60	60	36	...	63	42	...	...	0.1	...	...	52.0	—
Haiti	216,013	19	...	5	...	...	2	25	16	0.7	10.3	5.5	6.9	0.1
Honduras	164,543	26	70	30	33	70	32	15	8	0.1	67.8	0.8	113.5	0.1
Jamaica	58,500	...	...	34	...	...	25	...	...	0.5	0.6	0.5	1.2	—
Mexico	2,848,000	40	40	26	9	...	49	...	...	0.0	7.5	0.8	40.9	0.9
Nicaragua	114,685	25	...	...	15	48	22	...	...	0.2	90.1	3.2	137.8	0.7
Panama	53,853	68	75	46	47	77	44	30	16	—	33.4	1.5	103.1	—
Paraguay	105,461	31	40	17	10	41	14	32	29	0.8	52.1	11.0	72.2	0.4
Peru	690,000	48	35	14	19	36	14	...	...	1.6	39.1	2.3	71.8	1.4
Saint Lucia	4,000	...	...	56	...	...	58	...	...	—	15.8	0.8	29.2	—
St. Vincent and the Grenadines	3,300	...	...	26	...	...	26	...	...	—	—	—	262.2	—
Suriname	14,500	...	24	17	...	24	16	...	...	—	—	—	66.0	—
Trinidad and Tobago	26,300	...	59	23	...	65	34	...	...	—	0.9	2.6	34.6	—
U.S.A.	3,276,000	...	...	...	...	...	...	...	...	0.0	0.8	0.0	5.9	0.0
Uruguay	53,386	96	85	53	18	84	59	31	28	—	5.6	0.8	5.3	—
Venezuela	506,441	66	53	46	40	...	80	...	...	0.1	26.1	...	80.1	0.0

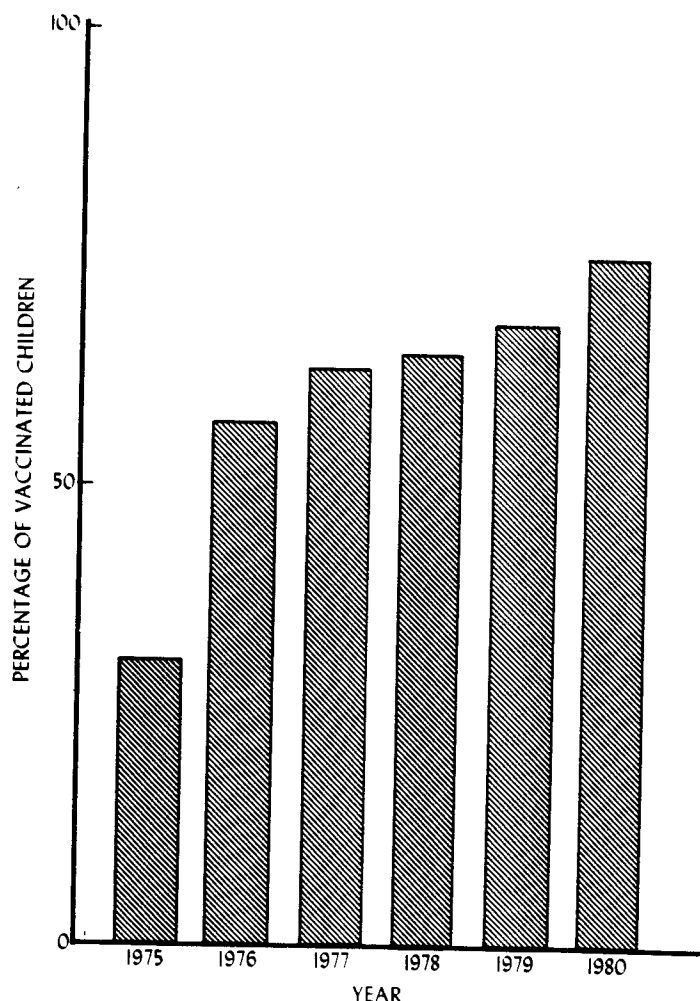
— No cases

... Data not available

Vaccination coverage

The coverage of children under 1 year of age who are vaccinated annually is on the increase, having reached 75.6 percent in 1980 (Figure 3).

FIGURE 3. Measles vaccination coverage of population under 1 year of age. Rio Grande do Sul, Brazil, 1975-80.



Source: Epidemiological Surveillance Unit, SSMA.

While vaccination coverage of the population under 1 year of age has reached 75 percent overall, this is not the situation everywhere in the state, as many municipalities have not yet reached this average. Moreover, even in municipalities where coverage is high, unprotected foci persist (the inhabitants on the outskirts of large cities and scattered rural populations), and the incidence of measles remains high. This makes it necessary to step up measles vaccination, within the framework of comprehensive health care, with coverage of the population under 5 years of age as the objective. Only in this way can measles incidence and mortality be lowered to minimal levels and the risk of epidemics be removed.

Source: *Informe Epidemiológico*, Secretariat of Health and Environment, State of Rio Grande do Sul, Brazil, January 1981.

Retesting of Vaccines: Update to EPI Manual of Operations

Table 1 gives an update on the minimum number of doses of vaccine which should be in stock in order to justify having the vaccine retested for potency. The new figures take into account both the cost of the tests and the cost of the vaccine which is suspected to have lost its potency.

TABLE 1. The retesting of vaccines

Vaccine	No. of doses involved justifying test	No. of doses needed for test ^a	Conditions of transport
Measles (freeze-dried)	2,000	50	4°C-8°C
Poliomyelitis (oral)	2,000	50	-20°C
Poliomyelitis (killed)	20,000	50	4°C-8°C
BCG (freeze-dried)	10,000	100	4°C-8°C
Diphtheria/Pertussis/Tetanus (DPT) ^b	100,000	100	4°C-8°C
Quadruple Diphtheria/Pertussis Tetanus/Polio (killed) (DPT/Polio)	10,000	100	4°C-8°C
Diphtheria/Tetanus Toxoid (DT)	100,000	100	4°C-8°C
Tetanus Toxoid (TT)	25,000	100	4°C-8°C

^aTaken from at least five different locations in the store.

^bThe figure given for DPT is based on the assumption that only the pertussis component would be tested, and the figure for DPT polio (killed) is based on the assumption that only the polio component would be tested.

These revised guidelines should replace the relevant pages in the EPI Manual (Book I, Annex 4, page 6, and Book III, Section 2, Figure 2.3, page 14). They also update the table which appeared on page 5 of the *EPI Newsletter*, Vol. II, No. 4, of August 1980.

Source: WHO, Geneva, June 1981.

Rotary International Support to EPI in Bolivia and Haiti

Cooperation between the Rotary Clubs in Bolivia and Haiti and their respective Ministries of Public Health has produced joint proposals for the support of these countries'

**NUMBER OF REPORTED CASES OF MEASLES, POLIOMYELITIS, TETANUS, DIPHTHERIA AND
WHOOPING COUGH. 1981 AND 1980, BY COUNTRY AND DATE OF LAST REPORT.**

COUNTRY	DATE OF LAST REPORT	MEASLES		POLIOMYELITIS		TETANUS		DIPHTHERIA		WHOOPING COUGH	
		1981	1980	1981	1980	1981	1980	1981	1980	1981	1980
ARGENTINA	18 JUL. 81	5,647	2,221	...	31	113	116	38	45	9,037	11,917
BAHAMAS	05 SEP. 81	36	437	—	—	2	3	—	—	7	12
BARBADOS	29 AUG. 81	1	26	—	—	7	8	8	4	4	—
BOLIVIA	31 JAN. 81	353	159	3	—	12	11	2	7	286	111
BRAZIL	23 MAY 81	19,121	24,302	76	975	953	1,134	1,430	1,807	14,263	16,104
CANADA	08 AUG. 81	1,823	12,145	—	—	1 ^a	1	3	43	1,254	1,264
CHILE	08 AUG. 81	1,820	2,231	...	—	12	14	137	147	1,595	627
COLOMBIA	18 MAY 81	6,507	3,106	82	45	192	231	54	148	1,832	2,893
COSTA RICA	01 AUG. 81	104	749	—	—	5	7	—	—	136	586
CUBA	25 JUL. 81	5,192	2,891	—	—	14	14	—	—	108	60
DOMINICA	08 AUG. 81	—	—	—	—	1	2	—	—	1	1
DOMINICAN REP.	31 AUG. 80 ^b	...	7,306	...	87	...	74	...	150	...	255
ECUADOR	28 FEB. 81	1,150	370	6	—	19	14	3	1	62	210
EL SALVADOR	15 AUG. 81	6,941	1,317	37	4	83	45	1	—	1,711	364
GRENADA	29 AUG. 81	8	52	—	—	—	1	—	1	—	—
GUATEMALA	23 MAY 81	1,426	1,284	16	32	32	34	14	5	583	608
GUYANA	06 JUN. 81	19	358	...	...	...	9	—	1	8 ^c	...
HAITI	18 JUL. 81	494	99	— ^d	4	21	78	2	6	38 ^d	413
HONDURAS	29 AUG. 81	2,640	3,094	10	3	15	21	—	2	814	1,629
JAMAICA	11 JUL. 81	3,993	16	—	—	12	6	4	4	10	8
MEXICO	28 FEB. 81	2,687	3,686	28	149	71	83	—	—	836	609
NICARAGUA		...	...	...	...	...	...	...	...	...	...
PANAMA	27 JUN. 81	1,207	1,146	—	—	21	17	—	—	67	360
PARAGUAY	18 JUL. 81	302	245	7	6	96	97	4	3	284	558
PERU	15 AUG. 81	4,135	4,147	104	81	191	154	53	116	2,199	2,059
SAINT LUCIA	04 JUL. 81	87	25	—	—	2	—	—	—	375	—
ST. VICENT AND THE GRENADINES	09 MAY 81	—	227	—	—	—	—	—	—	1 ^e	17
SURINAME	20 JUN. 81	688	2	—	—	...	...	1	—	...	...
TRINIDAD & TOBAGO	15 AUG. 81	3,370	233	—	—	10	15	3	—	8	7
U.S.A.	29 AUG. 81	2,624	12,747	3 ^f	10 ^g	39	54	3	2	741	1,024
URUGUAY	27 JUN. 81	1,787	69	—	—	6	7	—	—	182	118
VENEZUELA	01 AUG. 81	14,876	5,528	—	—	...	...	4	8	2,217	1,090

^a16 May 1981

^bData not available for 1981. Data for 1980 through
last epidemiological week in September.

^c31 January 1981

^d27 June 1981

^e25 April 1981

^f1 paralytic case

^g4 paralytic cases

— No cases

... Data not available

expanded programs on immunization, particularly with regard to poliomyelitis vaccination. These proposals were presented to the Health, Hunger and Humanity Committee of Rotary International in Chicago, Illinois, and have been approved for implementation.

According to the terms of these proposals, Bolivia and Haiti will receive approximately \$100,000 and \$187,000, respectively, which will be used for the purchase of vaccines and cold chain equipment.

Editorial note: If the developing countries are to reach the goal of providing immunization services to all children of the world by 1990, considerable support from bilateral, multilateral, and private organizations will be of paramount importance to assure that the necessary resources are made available.

Community participation in all phases of the EPI program will also be crucial for the achievement of its goals. The joint proposals developed by the Rotary Clubs in Bolivia and Haiti and the support given to them by Rotary International are an excellent example of community involvement and support by private organizations of a high-priority primary health care program. The resources provided under these proposals will be of great assistance in strengthening the EPI programs in both countries.

World Congress on Health Information Systems and the Developing Countries: Mexico City, 6-12 February 1982

A world congress on health information systems and the developing countries will be held in Mexico City from 7 to 12 February 1982. The Mexican Academy of Information Systems, Mexican Society of Public Health and Mexican Society of Health Statistics have organized this congress to promote and analyze the application of information systems to health care.

It is hoped that not only specialists in medical computer programming will attend the meeting, but also doctors, statisticians, nurses, nutritionists, administrators and, in general, all those interested in health information systems, with particular emphasis on developing countries.

Poster exhibits are planned, as well as presentations of laboratory computer software, hospital and ambulatory care information systems and microprocessor applications.

The World Health Organization, Pan American Health Organization and International Medical Informatics Association are jointly sponsoring the congress. Further information may be obtained from:

Congreso Mundial "La Informática Médica y los Países en Desarrollo"
Plaza de la República No. 6-3er piso
México 1, D.F., México

Cuban Contribution to the EPI Revolving Fund

At the XXVIII Meeting of PAHO's Directing Council (21 September-2 October 1981), Cuba announced its contribution of \$1,000 to the EPI Revolving Fund for the purchase of vaccines. Capitalization of the fund now stands at \$2,302,000, which is 58 percent of the \$4,000,000 originally estimated as necessary for smooth, uninterrupted fund operations.

At this year's meeting, the Directing Council authorized the Director to pursue the alternatives recommended by the Executive Committee to reach full capitalization of the fund. At the same time, other countries were encouraged to follow the example of those which have already made voluntary contributions. In addition to Cuba, the Netherlands and Barbados have also made donations to the capitalization of the fund.

The *EPI Newsletter* is a periodic publication prepared by the Expanded Program on Immunization (EPI) of the Pan American Health Organization, Regional Office for the Americas of 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.

References to commercial products and the publication of signed articles in this newsletter do not constitute endorsement by PAHO/WHO, nor do they necessarily represent the policy of the Organization.

Editor: Dr. C. A. de Quadros
Assistant Editor: Mr. P. Carrasco
Editorial Assistant: Ms. K. Fitch

Contributors to this issue
Ms. M. Anderson, PAHO
Dr. Marjorie Pollack, PAHO Short-term Consultant



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

ISSN 0251-4710