EPI Newsletter

Expanded Program on Immunization in the Americas

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Polio in the Americas: First 17 Weeks, 1986

Through 26 April 1986, 306 cases of poliomyelitis were reported to EPI/PAHO from six countries in the Americas; for the same period in 1985, 166 cases were reported from nine countries (Table 1). A comparison of reported polio cases by week shows that, for most weeks, more cases are being reported this year than last

TABLE 1. Reported cases of poliomyelitis for weeks 1-17, 1986 and cumulative number of cases in 1986 and 1985, Region of the Americas (provisional data)

Country	Cumulative 1986	Cumulative 1985	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12	Week 13	Week 14	Week 15	Week 16	Week 17
Argentina	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Bolivia	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Brazil	193	45	—	2	4	2	5	6	1	10	14	7	5	15	24	13	23	49	13
Canada	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Chile	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Colombia	31	1	1	2	2	1	—	2	1	3	3	2	2	3	2	3	—	2	2
Costa Rica	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Cuba	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Dominican Rep.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Ecuador	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
El Salvador	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
French Guiana	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Guatemala	21	—	1	2	1	2	3	1	1	—	2	2	3	—	2	1	—	—	—
Haiti	8	40	—	2	—	1	—	—	—	—	—	—	—	—	2	1	—	1	1
Honduras	—	2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mexico	48	52	—	—	2	3	1	5	10	2	4	2	3	6	3	3	3	1	—
Nicaragua	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Panama	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Paraguay	—	3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Peru	5	21	—	—	1	—	—	1	1	—	—	1	—	—	—	—	1	—	—
United States	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Uruguay	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Venezuela	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
CAREC*	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
TOTAL	306	166	2	8	10	9	9	15	14	15	23	14	13	24	33	21	27	53	16

* *Includes all countries which report to the Caribbean Epidemiology Center (countries and territories of the English-speaking Caribbean, as well as Guadeloupe and Suriname).*
— *No cases*

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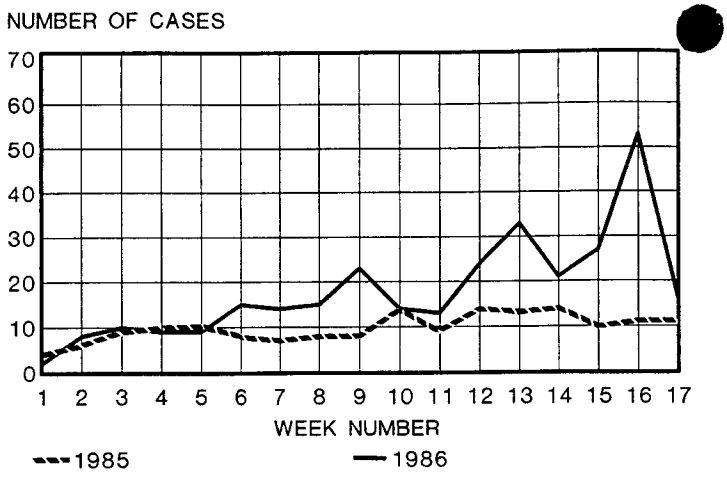
(Figure 1). Most of this increase is due to the fact that Brazil, Colombia and Guatemala have been reporting considerably more cases of poliomyelitis in 1986 than in 1985.

Editorial note: Since the inception of the EPI in the Americas in 1977, there has been a steady decrease in the number of reported poliomyelitis cases. The results of reports for the first 17 weeks of 1986, however, indicate a reversal of the downward trend. Such an increase was anticipated by the EPI Technical Advisory Group which noted in the conclusions of its second meeting that "It is quite possible that the improved surveillance may detect a large enough number of previously unreported cases that there may seem to be a paradoxical increase in cases, even in the face of improved immunization levels."

FIGURE 1. Number of poliomyelitis cases reported in countries of the Americas, weeks 1-17, 1985 and 1986



Poliomyelitis: United States, 1975-1984

In September 1985, CDC-selected consultants individually reviewed clinical, laboratory, and epidemiologic data on 150 suspected cases of poliomyelitis reported to CDC from 1975-1984. CDC's Division of Immunization, Center for Prevention Services, and Division of Virology, Center for Infectious Diseases, had tentatively determined that 121 cases met the case definition for paralytic poliomyelitis.* Overall, 118 cases were accepted by the consultants as cases and classified according to an epidemiologic classification system established in 1975 that provides "epidemic," "endemic", "imported," and "immune-deficient" categories (Table 1).

Compared to the average of 15,822 cases per year during 1951-1955, the period directly preceding the widespread availability and use of polio vaccines, U.S. cases averaged 15 per year during 1975-1979 and declined to nine per year during 1980-1984. Of the total 118 cases for 1975-1984, 10 (8%) were epidemic cases, i.e., were epidemiologically linked with another cases(s), all from a 1979 epidemic caused by a wild type 1 poliovirus; 12 (10%) were imported cases among U.S. citizens with illness onset before or after return to the United States; and 11 (9%) were cases occurring among persons with primary immunodeficiencies. One of these latter cases, which occurred in 1981 in a nontraveler, was the last case of endemic, wild-virus poliomyelitis in the United States. The remaining 85 (72%) cases were endemic, i.e., were not epidemiologically linked to another case(s); 71 (60%) were epidemiologically associated with vaccine usage. Of the 71 vaccine-associated cases, 30 (42%) occurred among vaccine recipients, and 41 (58%), among contacts of vaccine recipients. Fourteen (40%) of the endemic cases were not epidemiologically associated with vaccine; however, five had virus isolates characterized definitively as vaccine-related.

Reported by Surveillance, Investigations, and Research Br, Div of Immunization, Center for Prevention Svcs, Div of Viral Diseases, Center for Infectious Diseases, CDC.

Editorial Note: Continuing transmission of wild virus-caused paralytic poliomyelitis has been eliminated in the United States using the currently recommended immunization policy of the Immunization Practices Advisory Committee (ACIP), which relies primarily on oral polio vaccine (OPV) use for the primary immunization series (1). From 1980 to 1984, only three of 45 cases (two imported and one immune-deficient) were documented as wild by strain characterization of poliovirus isolates. A third imported case was presumed epidemiologically to be caused by a wild poliovirus. Otherwise, the rare cases of reported paralytic poliomyelitis in the United States have been vaccine-associated.

The risk of vaccine-associated paralytic poliomyelitis, based on 85 cases occurring in immunologically

* Since 1969, the CDC definition of a case of paralytic poliomyelitis has been a patient with paralysis clinically and epidemiologically compatible with poliomyelitis who, at 60 days after onset of symptoms, has a residual neurological deficit, has died, or for whom no information is available on neurologic residua.

TABLE 1. Epidemiologic classificacion of reported poliomyelitis cases, by year, United States, 1975-1984

Category	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	10-year Sub-total	10-year Total
Epidemic												**10**
No OPV	0	0	0	0	10[a]	0	0	0	0	0	10	
OPV received	0	0	0	0	0	0	0	0	0	0	0	
Endemic												**85**
Not vaccine-associated	3	1	4	2	1	1	0	1	0	1	14	
OPV recipient	0	2	3	3	6	2[b]	1	3	7	3	30	
OPV contact											41	
(Household)	3[c]	3	6	1	4	1	3	3	3	1	(28)	
(Nonhousehold)	0	0	5[d]	1	1	1	2	2	1	0	(13)	
Imported	4[e]	2	2	1	0	2	0	0	0	1	12	**12**
Inmunodeficient	3	2	0	0	0	2	1[f]	1	1	1	11	**11**
Total	**13**	**10**	**20**	**8**	**22**	**9**	**7**	**10**	**12**	**7**		**118**

[a] *Outbreak among Amish caused by type 1 poliovirus.*
[b] *One patient received OPV on same day as twin and had onset 38 days later.*
[c] *One patient had poliovirus type 3 and ECHO 9 isolated from stool.*
[d] *One patient with severe persistent paralysis had coxsackie B1 isolated from pharynx; however, clinical findings met CDC case definition of paralytic poliomyelitis.*
[e] *One patient had onset 2 months before returning to the United States.*
[f] *Wild type poliovirus isolated (source unknown).*

normal recipients and contacts and the distribution of an estimated 274.1 million doses of OPV during 1973-1984, is one case per 3.22 million doses of OPV distributed.

When all 104 vaccine-associated cases (85 among immunologically normal recipients and contacts; 13 among immune-deficient recipients and contacts; and six others, patients from whom a vaccine-like virus was isolated) from this same period are included, the overall vaccine-associated risk is one case per 2.64 million doses of OPV distributed.

At the 24-25 October 1985 meeting of the ACIP, issues concerning polio vaccines and current polio vaccination policy in the United States were reviewed. Discussion included live polio vaccine and both the currently available inactivated polio vaccine (IPV) and a more potent IPV not currently available in the United States. The issues discussed included seroconversion, intestinal immunity, duration of immunity, replication of poliovirus in the intestine, safety, immunization coverage, seroprevalence, the current epidemiology of poliomyelitis in the United States, and the estimated likelihood of wild poliovirus introduction. In light of the data reviewed, the ACIP concluded that no change in the basic U.S. approach to poliomyelitis (primary reliance on OPV with selected use of IPV (1)) is warranted currently but that the subject should be reviewed on a continuing basis.

Reference:

(1) ACIP. Poliomyelitis prevention. *MMWR* **31**:22-26, 31-34, 1982.

Source: *Morbidity and Mortality Weekly Report (MMWR)* **35**(11):180-182, 21 March 1986.

Measles: United States, First 26 Weeks, 1985

Through December 28, 2,704 measles cases in the United States were reported to the *Morbidity and Mortality Weekly Report* (MMWR) for 1985. Results of detailed analyses are available for cases reported during the first 26 weeks, when a provisional total of 1,802 cases was reported, a 2.4% increase over the 1,759 cases reported during the same period in 1984 (1). The overall incidence rate in both years was 0.8 cases per 100,000 population for the 26-week period. Eight states accounted for 1,333 (73.9%) cases: Illinois (259 cases), Texas (236), Arizona (194), California (143), Montana (139), Idaho (126), New York (124), and Massachusetts, (112). Ten states had incidence rates greater than 1/100,000 population: Arizona, Hawaii, Idaho, Illinois, Maryland, Massachusetts, Montana, Texas, West Virginia, and Wisconsin. During the first half of 1984 and

1985, 19 and 20 states, respectively, reported measles cases (indigenous or imported). For each year, 2.5% of the nation's 3,139 counties reported measles cases during the period.

Detailed information was provided to the Division of Immunization, Center for Prevention Services, CDC, on 1,801 of the cases reported during the first 26 weeks of 1985. Of these, 1,750 (97.2%) met the standard case definition for measles,[1] and 661 (36.7%) were serologically confirmed. In most cases (72%), onset of rash occurred between weeks 8 and 20 (weeks ending February 23 and May 25, respectively). There was a biphasic distribution of cases during this period (Figure 1).

In the first half of 1984, the highest incidence rate was reported among children 10-14 years of age (Table 1). By comparison, the first half of 1985, the highest incidence rate was reported among 15- to 19-years-olds (3.1/100,000), followed by preschool-aged children (2.5/100,000). The incidence rate among 10- to 14-year-olds decreased from 2.9/100,000 in 1984 to 1.8/100,000 in 1985. Of the 466 preschool-aged children with measles, 137 (29.4%) were infants under 1 year of age; 81 (17.4%) were 12-14 months of age; 24 (5.2%) were 15 months of age; and 224 (48.1%) were 16 months-4 years of age.

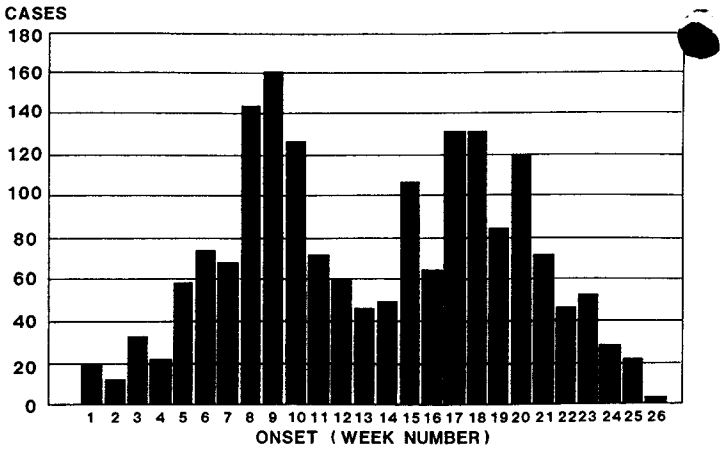
Of the 1,256 (69.7%) patients for whom the setting of transmission was reported, 903 (71.9%) acquired measles in school;[2] 126 (10.0%), at home; 63 (5.0%), in medical settings; 41 (3.3%), in daycare centers; 18 (1.4%), in church, and 105 (8.4%), in a variety of other settings, including sporting events and summer camp.

Seventy cases (3.9%) were international importations. An additional 128 (7.1%) cases were epidemiologically linked to an international importation within two generations of infection. Therefore, 198 (11.0% of all cases) were classified as international importations during this period (2).

[1] Fever (38.3°C [101° F] or higher, if measured), generalized rash of 3 days' or longer duration, and at least one of the following: cough, coryza, conjunctivitis.

[2] Includes kindergarten through college.

FIGURE 1. Reported measles cases, by week of rash onset, United States, first 26 weeks, 1985



Vaccination status of patients in 1984 and 1985 was similar. Of the 1,801 cases reported during the first 26 weeks of 1985, 859 of the patients had been vaccinated on or after the first birthday; 247 had been vaccinated at 12-14 months of age (Table 2). A total of 846 measles patients were unvaccinated, and 96 had histories of inadequate vaccination (vaccinated before the first birthday).

Of the 1,801 cases, 466 (25.9%) were classified as preventable (2) (Table 3). The highest proportion of preventable cases occurred among persons who were not of school age: 69.2% of cases among children 16 months-4 years of age were preventable. Only 20.4% of cases among persons 5-19 years of age were preventable; however, 47.0% of all preventable cases occurred in this age group.

Of the 1,335 persons with nonpreventable cases, 242 (18.1%) were too young for routine vaccination (under 16 months of age), and 42 (3.1%) were too old (born before 1957) (Table 4). Of the 1,051 who were between 16 months and 28 years of age, 842 (80.1%) had been vaccinated on or after the first birthday; 11 (1.0%) had a prior physician diagnosis of measles; 34 (3.2%) were not U.S. citizens; and 163 (15.5%) had medical contraindications

TABLE 1. Age distribution and estimated incidence rates of measles, United States, first 26 weeks, 1984 and 1985*

Age group (years)	1984			1985			
	No.	(%)	Rate+	No	(%)	Rate+	Rate change (%)
0-4	351	(19.9)	2.0	466	(25.9)	2.5	+25.0
5-9	201	(11.4)	1.3	152	(8.4)	0.9	-30.8
10-14	515	(29.2)	2.9	319	(17.7)	1.8	-37.9
15-19	470	(26.6)	2.4	603	(33.5)	3.1	+29.2
20-24	137	(7.8)	0.6	175	(9.7)	0.8	+33.3
≥25	91	(5.1)	0.1	86	(4.8)	0.1	0.0
Total	**1,765§**	**(100.0)**	**0.8**	**1,801**	**(100.0)**	**0.8**	**0.0**

*Provisional data.
+Per 100,000 population.
§The difference between this number and that in the text reflects differences between summary data reported to *MMWR* and more detailed data available to CDC's Division of Immunization.

TABLE 2. Ages of measles patients at most recent vaccination, United States, first 26 weeks, 1984 and 1985*

Age at vaccination	1984 No.	1984 %	1985 No.	1985 %
< 12 months	135	(7.6)	96	(5.3)
12-14 months	255	(14.4)	247	(13.7)
15 months	34	(1.9)	46	(2.6)
16 months - 4 years	303	(17.2)	325	(18.0)
5-9 years	139	(7.9)	165	(9.2)
10-14 years	32	(1.8)	70	(3.9)
15-19 years	8	(0.5)	5	(0.3)
≥ 20 years	2	(0.1)	1	(0.1)
Unknown (> 12 mo.)	3	(0.2)	0	(0.0)
Unvaccinated	854	(48.4)	846	(47.0)
Total	**1,765**	**(100.0)**	**1,801**	**(100.0)**

*Provisional data.

TABLE 3. Age distribution and preventability of measles cases, United States, first 26 weeks, 1985*

Age group	Preventable No.	Preventable (%)	Nonpreventable No.	Nonpreventable (%)	Total
< 15 months	0	(0.0)	242	(100.0)	242
16 months - 4 years	155	(69.2)	69	(30.8)	224
5-9 years	32	(21.1)	120	(78.9)	152
10-14 years	52	(16.3)	267	(83.7)	319
15-19 years	135	(22.4)	468	(77.6)	603
20-24 years	60	(34.3)	115	(65.7)	175
25-29 years	32	(60.4)	21	(39.6)	53
≥ 30 years	0	(0.0)	33	(100.0)	33
Total	**466**	**(25.9)**	**1,335**	**(74.1)**	**1,801**

*Provisional data.

or exemptions under state law. One person (0.1%) had laboratory evidence of immunity.

Reported by Div of Immunization, Center for Prevention Svcs, CDC.

Editorial Note: In the prevaccine era, an average of 500,000 measles cases was reported each year (3). After measles vaccine was licensed in 1963, the incidence of measles markedly declined. Since 1981, the number of reported measles cases has remained relatively constant: 3,124 in 1981, 1,714 in 1982, 1,497 in 1983, and 2,543 in 1984. The number of cases reported during the first half of 1985 is similar to that reported during the first half of 1984 (1). As in recent years, measles was geographically restricted: 97.5% of the nation's counties were free of measles during this period.

While incidence rates during the first 26 weeks of 1984 and 1985 were comparable, there were differences in the age characteristics of patients. In 1984, persons 10-14 years of age accounted for approximately 29% of cases, compared with only 18% of cases in 1985. The incidence rate for 15- to 19-years-olds was higher in 1985. Over a third of measles patients were in this age group, due in part to the large number of outbreaks on college campuses in 1985 (4). Colleges and universities are now beginning to require evidence of immunity to measles for matriculation; this requirement should result in a decrease in measles in this population.

As the measles elimination strategy is successfully implemented, the proportion of preventable cases should decrease. The decrease in the percentage of preventable cases from 34.6% in 1984 (1) to 25.2% during the first half of 1985 is encouraging. As in 1984, preschool-aged children over 15 months of age had the highest proportion of preventable cases. Because these children

TABLE 4. Reasons measles cases were classified as nonpreventable, United States, first 26 weeks, 1985*

Causes of nonpreventability			No. of cases (%)		Percentage of total cases
<16 months			242	(18.1)	13.4
Born before 1957			42	(3.1)	2.3
16 months - 28 years			1,051	(78.7)	(58.4)
Adequately vaccinated	842	(80.1)			
Prior physician diagnosis	11	(1.0)			
Non-U.S. citizens	34	(3.2)			
Exemptions+	163	(15.5)			
Laboratory evidence of immunity	1	(0.1)			
Total			**1,335**	**(100.0)**	**74.1**

*Provisional data.
+Medical exemptions—8; religious—150; philosophic—5.

are not reached by existing school laws, greater efforts need to be directed to this age group. School-aged persons accounted for the largest percentage of all preventable cases, and schools were the setting of transmission for the majority of cases. Therefore, continued enforcement of current school immunization laws is important for further reduction of measles in the United States.

References:
(1) CDC. Measles-United States, first 26 weeks, 1984. *MMWR* 33: 495-496, 501-504, 1984.
(2) CDC. Classification of measles cases and categorization of measles elimination programs. *MMWR* 31: 707-711, 1982.
(3) CDC. Measles surveillance report no.11, 1977-1981. Atlanta, Georgia: Centers for Disease Control, 1982.
(4) CDC. Measles on college campuses—United States, 1985. *MMWR* 34: 445-449, 1985.

Source: *Morbidity and Mortality Weekly Report (MMWR)* 35(1):1-4, 10 Jan 1986.

Choice of Syringes for the EPI

"The discovery of LAV/HTLV-III virus as the cause of acquired immunodeficiency syndrome (AIDS), coupled with the increasing recognition that retroviruses are circulating in many countries, has raised the question whether unsterile immunization techniques might contribute to LAV/HTLV-III transmission. Thus far, there has been no demonstrated transmission of LAV/HTLV-III virus as a result of immunization. Given the benefits of immunization, programs should continue to try to achieve the highest levels of coverage possible. Since the possibility exists that unsterile needles and unsterile syringes can transmit not only LAV/HTLV-III, but also other infectious agents including hepatitis viruses, immunization programs have the obligation to ensure that a sterile needle and a sterile syringe are used with each injection."

(Report of the Global Advisory Group of the EPI, November 1985)[1]

As new strategies are sought to accelerate the progress of the EPI, the single-use disposable syringe is increasingly viewed as the least costly and surest way to achieve the above objective. The main flaw in this argument is that in countries accustomed to shortages and reluctant to waste equipment, it is virtually impossible to prevent the reuse of syringes. The two-piece polyethylene disposable syringe cannot be sterilized without distortion which prevents the needle from fitting properly and causes leakage. Until disposable syringes are developed which automatically destroy themselves after a single use, many users will sterilize them improperly and they will continue to pose a serious risk of transmission of infectious agents.

Recent advances in high-temperature plastics and the reduction of costs due to high-quantity manufacture suggest that the sterilizable plastic syringe is both more practical and less costly than the single-use disposable syringe. The unbreakability of plastic syringes already makes them superior to conventional glass syringes. Table 1 charts the cost per injection of a selection of plastic syringes and the maximum number of sterilizations which satisfy standard criteria including leakage, capacity, friction, legibility, transparency, resistance to shock and corrosion.

It is clear that the cost per injection of sterilizable plastic syringes is dramatically lower than the cost of a disposable syringe. Also, a wide difference in costs per reusable syringe can be seen which does not correlate with the number of sterilizations that can be successfully achieved. The syringe of choice would appear to be one which offers 200 sterilizations, or about one year's use, at the lowest cost per injection.

The cost of injection equipment per immunized child, including sterilization and maintenance (other supplies including needles, storage, transport and fuel) has been estimated on the basis of WHO studies of steam

TABLE 1. Comparison of plastic syringe costs

Model code	Capacity in ml	Maximum number of sterilizations	Cost per syringe	Cost per injection
E	2.00	50	0.085	0.0017
A	0.10	200	0.380	0.0019
B	0.10	200	0.470	0.0024
C	1.00	200	0.470	0.0024
F	2.00	200	0.640	0.0032
G	2.00	—[a]	0.015	0.0150
D	1.00	50	1.790	0.0358

[a] Disposable

[1] See *EPI Newsletter* VIII-1 (February 1986), page 6.

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	*	...	...	—	—	...	...	...	...	...	...	...	...
United States	19 Apr.	1,845	816	—	1	12	15	**	**	—	1	640	469
CARIBBEAN													
Antigua & Barbuda	25 Jan.	—	—	—	—	—	—	—	—	—	—	—	—
Bahamas	19 Apr.	12	12	—	—	—	4	—	—	—	—	—	1
Barbados	22 Mar.	—	—	—	—	1	—	—	—	—	—	1	—
Cuba	*	...	...	—	—	...	...	...	...	...	...	...	...
Dominica	22 Mar.	14	14	—	—	—	—	—	—	—	—	—	—
Dominican Republic	*	...	...	—	—	...	...	...	...	...	...	...	...
Grenada	19 Apr.	1	6	—	—	—	—	—	—	—	—	7	—
Haiti	*	...	...	8	40	...	...	...	...	...	...	...	...
Jamaica	25 Jan.	6	...	—	—	—	...	—	...	—	...	—	...
St. Christopher/Nevis	22 Mar.	4	22	—	—	—	—	—	—	—	—	1	—
Saint Lucia	22 Feb.	1	3	—	—	—	—	—	—	—	—	—	—
St. Vincent and the Grenadines	*	...	...	—	—	...	...	...	...	...	...	...	...
Trinidad & Tobago	22 Feb.	543	455	—	—	—	1	—	—	—	—	2	—
CONTINENTAL MID AMERICA													
Belize	19 Apr.	7	4	—	—	—	2	—	—	—	—	5	14
Costa Rica	*	...	...	—	—	...	...	...	...	...	...	...	...
El Salvador	*	...	...	—	—	...	...	...	...	...	...	...	...
Guatemala	25 Jan.	44	...	21	—	3	...	1	...	...	...	19	...
Honduras	19 Apr.	286	...	—	2	2	...	4	...	—	...	33	...
Mexico	*	...	...	48	52	...	...	...	...	...	...	...	...
Nicaragua	22 Mar.	440	...	—	—	...	...	...	...	—	...	85	...
Panama	*	...	...	—	—	...	...	...	...	...	...	...	...
TROPICAL SOUTH AMERICA													
Bolivia	*	...	...	—	—	...	...	...	...	...	...	...	...
Brazil	*	...	...	193	45	...	...	...	...	...	...	...	...
Colombia	*	...	...	31	1	...	...	...	...	...	...	...	...
Ecuador	*	...	...	—	—	...	...	...	...	...	...	...	...
Guyana	*	...	...	—	—	...	...	...	...	...	...	...	...
Paraguay	22 Feb.	73	28	—	3	10	1	4	3	2	2	28	80
Peru	22 Feb.	7	...	5	21	—	...	3	...	1	...	14	...
Suriname	*	...	...	—	—	...	...	...	...	...	...	...	...
Venezuela	22 Feb.	1,918	5,177	—	1	—	—	—	—	—	2	338	188
TEMPERATE SOUTH AMERICA													
Argentina	22 Feb.	698	1,821	—	—	17	16	**	**	7	1	446	1,582
Chile	22 Mar.	2,749	961	—	—	6	7	**	**	41	20	8	492
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 17 (ending 26 April).

— No Cases

... Data not available

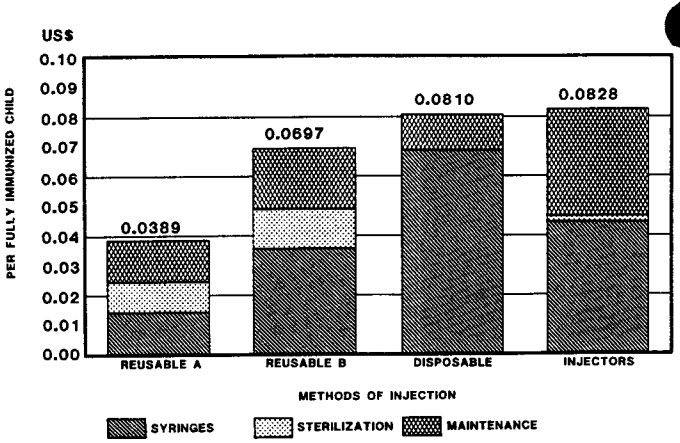
sterilization and jet injection equipment. These estimates are presented in Figure 1 and show that the reusable syringe remains the least-cost alternative even when indirect costs are included. Syringe model codes "B" and "C" in Table 1 were used in the WHO study.[2]

The "A" and "B" estimates in Figure 1 for sterilizable plastic syringes represent the range of costs which have been seen in different country situations. Because the life of these syringes is determined by the number of sterilizations, their rate of utilization strongly affects the cost per immunized child. Thus, estimate "A" is typical of a situation where the equipment is intensively used and estimate "B" represents a lower rate of utilization and a larger quantity of equipment in each health center.

Jet injector costs are affected in a similar, but more dramatic way. Low utilization rates seen in an African country in 1980 would, at today's prices, have resulted in a cost per immunized child of over US$0.20.

Following the successful outcome of four country studies by WHO and the positive experience of several countries in Latin America, steam sterilization of syringes and needles would seem to be both practical and highly effective. In order to provide a sterile syringe and needle for each injection, the quantities of equipment needed in the field will be higher than that needed for multiple-dose administration of vaccine from a single syringe. But the quantities of reusable syringes to be purchased, stored and distributed will be of the order of 0.5% the quantity of disposable syringes for the same task. When the fragility of the logistical systems of many national programs is considered, this appears to be an important advantage.

FIGURE 1. Costs of injection methods (US$ per fully immunized child)



Source: WHO *Wkly Epidem Rec* 6:41-43, 1986.

[2] These syringes are listed in the 1985-86 edition of the WHO/UNICEF EPI Product Information Sheets, available on request to the editor.

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