EPI Newsletter

Expanded Program on Immunization in the Americas

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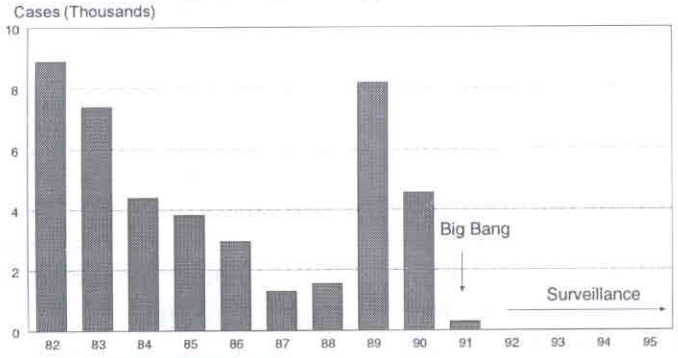
Four Years Without Measles!

The Twelfth Meeting of the Caribbean EPI Managers, held in San Juan, Puerto Rico, from 13-16 November 1995, reviewed the successful results of the measles elimination strategies currently being implemented throughout the English-speaking Caribbean. It has been four years since the last laboratory confirmed case was reported in the area. This achievement follows the region's commitment to conduct mass immunization campaigns which have reached over 90% of all children between 9 months and 14 years of age, and the development of sensitive surveillance systems. The English-speaking countries of the Caribbean have been pioneers in defining measles surveillance systems and in ensuring the involvement of community groups.

Measles cases, 1982-1995
English-speaking Caribbean



Source: Country Reports to CAREC
Big Bang - 1991 Mass Vaccination Campaign 9 mo.-14 yrs.

During the meeting, special emphasis was given to measles surveillance, such as case classifications, laboratory diagnosis and outbreak prevention. As in other regions of the Americas, the major issue continues to be the build-up of susceptibles among preschool children in the various countries. Participants discussed possible vaccination strategies aimed at preventing this accumulation. Monitoring the build-up of susceptible populations and promoting an aggressive response to eliminate the susceptibility of these groups are the key components of the Caribbean's measles surveillance strategy. Other topics included the maintenance of a polio free status in the area and the elimination of rubella.

Measles Elimination

Despite intensive measles surveillance and the investigation of 888 suspected cases, the clear message coming from the English-speaking Caribbean countries and Suriname for the period 1992-1994, is that there has been no documented indigenous measles transmission. The last laboratory confirmed case was in Barbados in 1991 (see graph).

From 1992-1994, a pattern of higher rates of rash and fever observed at the beginning of the year has consistently coincided with the tourist high season. The lowest rates occur in August, a period when health staff take holidays. Rates have then increased in the latter part of the year, coinciding with the rainy season; during this time the incidence of dengue fever has also increased.

At the time of the November meeting, 300 suspected cases of measles had been reported. Of these, 274 (91%) had a first blood sample sent to the Caribbean Epidemiology Center (CAREC) and 110 had a second sample. No cases of measles were confirmed by laboratory during this period. Forty eight (17.5%) were discarded as rubella, and nine (3.3%) were diagnosed as dengue fever.

In this issue:

As mentioned earlier, the accumulation of susceptibles continues to be a source of concern. An analysis of the number of susceptibles within the English-speaking Caribbean was updated during the meeting. According to this report, by May 1996, five years since the "catch-up" campaign, there will be approximately 107,000 children (25%) within the ages of 1-5 years susceptible to measles. These numbers exclude Jamaica and Belize, which have conducted "follow up" campaigns. A sero-survey conducted in Jamaica in 1995, showed that sero-negative rates among vaccinated individuals averaged 15%. If these data are similar in other countries, the pool of susceptibles may be even larger than estimated. This number of susceptibles is more than sufficient to support a considerably large epidemic.

The current measles elimination strategy consists of four steps: national mass measles campaigns, intensification of measles surveillance, strengthening of routine vaccination activities, and the implementation of periodic "follow up" campaigns to eliminate the build-up of susceptibles. Virtually all countries in the Caribbean, as well as in Central and South America have already implemented the first three steps of this strategy. The fourth step, "follow-up" mass campaigns, has been conducted in Cuba, Belize, Brazil and Peru, and recently in the countries of Jamaica and Guatemala. During 1996, "follow up" campaigns are planned by almost all countries in Central America, and in Chile.

In the countries that have fully implemented the measles elimination strategy, the detection of a suspected measles case should result in improved surveillance and case investigation, with a rapid assessment of the level of vaccine coverage and of the need to carry out mop-up activities. The implementation of special control immunization campaigns are of limited benefit once an outbreak has begun. However, once a suspected or confirmed case has been detected, all contacts 1 to 14 years of age who lack evidence of vaccination should be immunized.

The main sources for surveillance data are disease reports (from doctors, nurses, health centers and hospitals), laboratory and population data, as well as vaccination coverage. The surveillance system can also accommodate modified case definitions, therefore rubella and dengue surveillance data are also being captured. During the meeting, discussions focused on additional ways to streamline laboratory diagnosis procedures, including the shipping of specimens to the reference laboratories.

Recommendations

To enhance measles survillance, countries should:

- Maintain heightened vigilance in the region, as well as in other parts of the world where measles is still occurring. If transmission has been eliminated, then importation is the only way that measles can re-emerge, and only if there are susceptible populations. Ten million tourists visit the Caribbean every year, and the Caribbean people also travel substantially. Equally important, the challenges in surveillance are now those of surveillance of a rare disease; many doctors and nurses have never seen a case.
- Upgrade the documentation when specimens are submitted to reference laboratories. It was recommended that PAHO/CAREC prepare guidelines on the subject to be disseminated among all doctors and medical schools in PAHO's Member Countries.
- Broaden the surveillance "net" to ensure that a wider number of suspected measles cases is reported. It was proposed that pediatricians and other private medical providers participate more actively in the current surveillance system, since they will most likely come in contact with imported cases. The suggested activities include:
  - meet with pediatricians, especially those who are likely to treat patients at high risk (due to migration, geographic location or tourism). Determine their familiarity with procedures for reporting suspected measles cases.
  - meet with staff at public clinics to discuss ways for involving private providers.
  - hold periodic meetings with local medical associations to explain the program and elicit support.
  - provide incentives, such as vaccine and diagnostic laboratory results for cooperation and participation in the surveillance system. Regarding sensitivity, once a standardized case definition is used by every country, those countries with annual rates of suspected cases <10/100,000 should examine their surveillance systems to improve the detection of suspected cases.

Polio Eradication

The International Commission for the Certification of Poliomyelitis Eradication declared the Americas polio-free in September, 1994. Although great progress has been made towards the global eradication of wild poliovirus, circulation continues in various parts of Africa and Asia. Until global eradication is achieved, the English-speaking Caribbean and the remainder of the Region of the Americas will continue to be at risk for importations of wild poliovirus.

Recommendations

- Immunization levels of at least 80% must be maintained in every district or parish of every country.
- Weekly negative reporting must be maintained from all reporting sites.
- The timely and complete investigation of acute flaccid paralysis (AFP) in children under 15 years of age must be continued.
- One adequate stool specimen per AFP case is now considered sufficient for virological analysis (refer to page 5 and to the October 1995 issue of *EPI Newsletter*).

- It is not necessary to routinely collect stool samples from contacts of cases, unless adequate stool samples cannot be collected from AFP cases, or the epidemiological investigation raises strong suspicions of polio transmission.

Rubella Control and Elimination Strategies

Laboratory testing of specimens for rubella from the rash and fever surveillance system from 1990-1995 at CAREC indicates widespread rubella virus circulation in the Caribbean. Rubella testing from several of the larger countries (Belize, Jamaica, Guyana and Suriname) shows continuous rubella virus circulation for the last four consecutive years. In 1995, outbreaks occurred in Jamaica and Guyana. A review of all rubella seroprevalence studies from the Caribbean shows that 30-50% of women of childbearing age (WCBA) are rubella sero-negative. By 1996, all countries will use a rubella-containing vaccine as part of their routine infant immunization schedule. Also, all countries will try to include MMR in their measles "follow up" campaigns. However, a rubella/ congenital rubella syndrome (CRS) prevention program limited to children under 5 years old will not reduce CRS for many years. Therefore, to significantly reduce CRS cases within the next five years, the following actions were recommended.

Recommendations

- Vaccinate all women of childbearing age.
- Vaccinate as many 5-18 year old school children as possible.
- Include the following components for rubella surveillance:
  - continue to test all measles IgM negative cases from the measles surveillance system for rubella IgM.
  - initiate a congenital rubella syndrome surveillance system which captures 50% of CRS cases that may occur in 0-12 month-old children with deafness alone.
  - start rash and fever surveillance for pregnant women.

Immunization Coverage

Immunization coverage was maintained at previous high levels. However, some countries reported that coverage had either dropped or remained stationary under the 90% mark. Coverage levels of less than 95% indicate that there are considerable numbers of unvaccinated children. It was also suggested that countries using Tetanus Toxoid should start using the combined diphtheria-tetanus (dT) vaccine. This will help ensure high levels of diphtheria coverage, in light of recent outbreaks in Eastern Europe and in Ecuador.

Missed Opportunities to Vaccinate

Trinidad and Tobago presented a study on missed opportunities for vaccination. As similar studies in other countries of the Americas have shown, opportunities to vaccinate children are often missed when they visit health facilities for treatment. Generally, these opportunities are missed due to false contraindications. This study re-emphasized the need for health care providers to use every opportunity to vaccinate children.

It was suggested that similar studies be conducted in other Caribbean countries to determine the level of missed opportunities and the application of corrective actions if warranted.

Social Mobilization

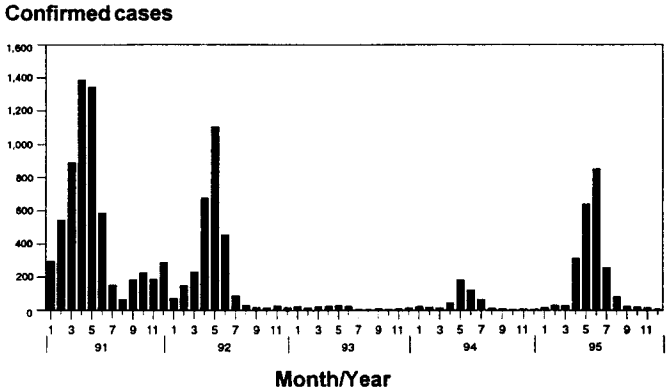
Continued social mobilization and the involvement of non-governmental organizations (NGOs) were mentioned as critical components to meet some of the goals of EPI, namely improving coverage, maintaining the eradication of polio, and eliminating the transmission of measles. The development of new links with NGOs was stressed. In the case of measles, social mobilization is being used to increase the population's awareness of the need to promptly take children of any age to a health facility when rash and fever occur.

Update: Measles in Canada, 1995

During 1995, a provisional total of 2,301 measles cases (7.9/100,000 population) was reported in Canada. This is 4.4 times greater than the 517 cases reported for the same period in 1994, and 11 times greater than the number reported for 1993 (204). Following major increases in the number of reported cases in April and May, the incidence peaked in June with 854 cases, followed by a sharp decline in July with 260 cases (Figure 1). Data since July show a downward trend, although the reporting is less likely to be complete. Sixteen cases were reported in November, followed by an additional eight cases during the month of December.

While seven of the 12 provinces/territories reported measles activity in the past 12 months, the overwhelming majority of cases were reported from Ontario: 2,253 (98%) of the total reported cases in Canada. The provisional annual

Confirmed measles cases by month of onset Canada, 1991-1995



Source: LCDC, Canada

measles incidence rate in that province was 21 cases per 100,000 population. No deaths linked to measles have been reported in 1995.

Confirmation Status

Of the 2,242 case records reviewed, 1,177 (52.5%) were laboratory-confirmed: 577 of these were specified as "positive for IgM" and the remaining cases as "laboratory-confirmed." Other cases were reported as "clinically compatible;" almost half of the cases in this group were also reported as "epidemiologically linked to laboratory-confirmed cases."

Age Distribution

Cases were distributed in all age groups; the median and mean ages were 10 and 11.1 years, respectively. School-aged children (5 to 19 years) accounted for 83% of the cases.

Vaccination Status and Preventability

Almost 90% of the 2,092 cases reviewed had a documented history of measles vaccination with one dose of vaccine; over 91% of these cases received vaccination between 1980 and 1994.

Based on age only, 90 cases (3.9%) were not eligible for vaccination, i.e., they were born before 1957 (19 cases) or were <12 months of age (71 cases). Immunization status was "unknown" or "unavailable" for 101 cases (4.5%).

Source: Dr. Paul Varughese, Dr. Philippe Duclos, Division of Immunization, Bureau of Infectious Diseases, Laboratory Centre for Disease Control, Ottawa, Canada.

Editorial Note:

In 1995, measles cases reported from Canada accounted for 80% of the total confirmed cases (laboratory and clinically confirmed cases) and 48% of the total laboratory confirmed cases in the region of the Americas, although its population represents only 3.6% of the Region's total population. The majority of the measles cases in Canada occurred in adequately vaccinated school-aged children. Thus, measles transmission in Canada appears to be due to vaccine failure rather than the failure to vaccinate.

Measles vaccine is known to be less than 100% effective. Various epidemiologic studies have estimated its effectiveness in field conditions as being between 85 and 95%. If we assume that measles vaccine is 90% effective and that vaccine coverage in a school population is 100%, then 10% of the school population will remain susceptible to measles. Due to the high transmissibility of measles, if measles virus is introduced into a highly vaccinated school population which has had little or no exposure to wild measles virus, there is potential for significant measles transmission. This is the likely explanation for the 1995 outbreak in Canada.

Canada's National Advisory Committee on Immunization (NACI) has reviewed the current measles situation and has made several recommendations to improve measles control in Canada. These recommendations include conducting a one-time "catch-up" measles vaccination campaign among school-aged children and the implementation of a routine two-dose schedule.

Five provinces are planning to conduct or have started "catch-up" measles vaccination campaigns among school-aged children. These provinces account for over 75% of Canada's total population and the target population for these campaigns is approximately 4.1 million children. It is likely that other provinces will conduct campaigns as well. Furthermore, a routine two-dose measles vaccination schedule has been started in four provinces and might be extended to all twelve Canadian jurisdictions within a year.

Experience from other countries of the Americas strongly suggests that, if high vaccine coverage is obtained, the "catch-up" vaccination campaign should result in the rapid interruption of measles virus circulation among school-aged children. However, in order to maintain the interruption of measles virus circulation, the major challenge for Canada in the future will be to maintain very high measles vaccine coverage in each successive cohort of newborns. If vaccination coverage can be maintained at 95% for infants by their second birthday, then the risk of sustained measles transmission in Canada will remain low.

With the implementation of these important steps, Canada now joins the other countries of the Americas in their efforts to eliminate measles from the Western Hemisphere.

Joint Statement on Polio Eradication

Following the recommendations of the United States and several provinces in Canada to change their poliomyelitis immunization schedule by adding doses of inactivated polio vaccine (IPV) to a basic course of oral polio vaccine (OPV), the Centers for Disease Control and Prevention, Rotary International and UNICEF have endorsed the following WHO statement on polio vaccines. In a joint statement they fully support WHO's position of maintaining the current global immunization policy for polio eradication, that is of using OPV alone, in light of the progress that has been achieved so far. Polio was eradicated from the Western Hemisphere in 1994, and it is likely to be eradicated from the entire world by the year 2000. The decision to change the immunization schedule responds to concerns about vaccine associated polio, which occurs at a rate of about 1 case per three million doses administered.

WHO Policy Statement on Polio Vaccines

Oral polio vaccine (OPV) is the only vaccine recommended for the eradication of poliomyelitis for the following reasons:

1. Oral polio vaccine provides superior protection against polio to children living in polio endemic countries.

Global polio eradication is not possible without the use of oral polio vaccine. OPV induces antibodies against polio

both in the blood and the intestines. Because the polio virus multiplies in the intestines and is spread through the feces, high levels of intestinal immunity are needed to stop the spread of the wild (naturally occurring) polio virus. OPV prevents infection of unimmunized children by stopping the spread of wild poliovirus. OPV also protects unimmunized children when the live, attenuated virus in the vaccine spreads from vaccinated children to unvaccinated children, inducing immunity against polio in the unvaccinated child. IPV produces minimal levels of intestinal antibodies and the use of IPV alone will not eradicate polio worldwide. Schedules using both IPV and OPV are not needed to interrupt transmission of wild poliovirus and are not recommended for the eradication of poliomyelitis.

2. Oral polio vaccine is a safe vaccine.

Vaccine associated polio is the only known complication from OPV. Vaccine associated polio is extremely rare, occurring at a rate of approximately 1 case per three million doses administered, or in 1 of every five hundred thousand infants. OPV is among the safest of all vaccines. In the past 10 years, nearly 1 billion children have received OPV and are successfully protected from polio. As a result of the use of OPV, over 140 countries report 0 cases of wild polio in 1994. WHO estimates that 550,000 cases of polio were prevented last year.

3. Oral polio vaccine can be easily and safely administered by mouth without the use of needles and syringes.

Oral polio vaccine can be administered by non-medical personnel with only minimal training. The extra manpower needed for mass immunization campaigns to eradicate polio can be easily mobilized if OPV is used. The use of volunteers saves on cost and there is no need to maintain a large supply of sterile syringes and needles.

4. Oral polio vaccine is affordable.

At $0.08 per dose through UNICEF procurement, OPV is affordable and available for all countries where polio remains endemic. IPV is expensive; a single dose of IPV may cost 5-10 times as much as a single dose of OPV. The introduction of mixed IPV/OPV schedules also has the potential to divert resources that could be used for the introduction of new or improved vaccines in national immunization programs or for other health activities.

5. Global polio eradication is the solution to vaccine associated polio.

Mixed IPV and OPV schedules will not prevent all cases of vaccine associated poliomyelitis. Once polio is eradicated worldwide, all polio immunization will stop and vaccine associated polio will no longer occur. Stopping polio immunization will result in global cost savings of at least $1.5 billion each year.

Polio Surveillance

The collection of only one adequate stool sample is recommended.

Starting with this issue of the *EPI Newsletter*, the surveillance indicator for acute flaccid paralysis (AFP) requiring the collection of two stool samples from 80% of AFP cases has been revised. From now on only one adequate stool sample will be requested to fully comply with the AFP surveillance indicators. This decision is based on the recommendation issued in 1995, (refer to *EPI Newsletter*, October 1995) by the Pan American Health Organization's Special Program for Vaccines and Immunization. As stated in that recommendation, the successful polio strategy in the Americas emphasized prompt identification of infected areas through the isolation of wild poliovirus from stool samples of AFP patients, rather than identification of each individual case. In a background paper, SVI demonstrated that of the 116 confirmed cases of poliomyelitis in the Americas during the 1987-1991 period, only in 2 cases, not related to any outbreak, there would have been no further opportunity to detect wild poliovirus if only one sample had been collected. Based on this SVI has concluded that, since the primary objective of AFP surveillance is to detect the presence of wild poliovirus circulation in a geographic area, only one adequate stool specimen from every case of AFP is sufficient.

This will substantially reduce the tremendous burden to both field workers and the laboratory network. It will also reduce the probability of contamination at laboratories and avoid delays in the prompt detection of the disease.

The global goal of polio eradication set for the year 2000 is still four years away. Therefore, every government in the Americas must continue allocating sufficient human and financial resources to sustain AFP surveillance and prompt case investigations, in order to maintain certification criteria.

AFP Surveillance Indicators

Country	80% Weekly Reporting Units	80% of cases investigated within 48 hours	80% of cases with 1 adequate stool sample taken	AFP RATE ≥ 1:100,000 for Children <15
Bolivia				
Chile				
Colombia				
Cuba				
Ecuador				
El Salvador				
Honduras				
Mexico				
Nicaragua				
Paraguay				
Peru				
Venezuela				
Costa Rica				
Dominican Republic				
Panama				
Brazil				
Argentina				
Guatemala				
Uruguay				
Haiti				

Meet criteria; * Data as of 29 January 1996

Source: EPI/PAHO (PESS)

Vaccine Quality: The Key to Effective Immunization

During 1995, PAHO placed special attention on strengthening the partnership between governments and vaccine manufacturers in the Americas to assure the quality of vaccines used by Member Countries in their regular immunizations programs. This strategy seeks to address the great diversity found in the Region with regard to policy and practices of vaccine production and quality control systems, and serves as another mechanism to enhance and harmonize the Regional System for Vaccines (SIREVA). While some countries have not yet established well-defined national control authorities to ensure that manufacturers follow established standards, others more advanced, particularly the vaccine-producing countries, have already organized national quality control laboratories.

What is meant by "Quality"

"Quality means that the vaccine is safe, potent, and effective, and is produced under conditions that ensure that each batch is of equally high quality. Manufacturers and governments work in partnership to ensure this high quality."

Governments' Role

National Control Authorities should:

- license vaccines according to published requirements
- evaluate clinical performance of vaccines
- control and release each batch or lot of vaccine individually
- perform laboratory testing
- monitor vaccine performance by post-marketing surveillance
- inspect manufacturing facilities and processes regularly

Manufacturers' Role

The primary responsibility for the quality of vaccines rests with manufacturers. Good Manufacturing Practices (GMP) is a system designed to guarantee that the product is made consistently, once it has been established how to make a safe, potent, and effective product. This is achieved by following a written procedure, ensuring that the equipment meets certain standards of performance, that facilities are designed and maintained to minimize variations in conditions, that staff are trained and are expert in the process they are following and that there is an independent assessment of this consistent operation. Key components within the system of Good Manufacturing Practices are the laboratories' adherence to quality control and quality assurance procedures.

Source: Global Program for Vaccines and Immunization/Children's Vaccine Initiative, UPDATE, October 1995

Efforts have been geared towards the organization of overall National Control Authorities (NCA) throughout the Region and National Control Laboratories (NCLs) in vaccine-producing countries, as well as the gradual implementation of a Regional Network of Vaccine Quality Control Laboratories (RNVQCL) among producing countries.

In August of 1994, plans for the creation of a Regional Network of Vaccine Quality Control Laboratories (RNVQCL) among the eight National Control Laboratories of DPT-producing countries were formalized during a meeting held in Santiago, Chile. These include the National Institute of Microbiology of Argentina; the National Institute of Quality Control for Health of the Oswaldo Cruz Foundation of Brazil; the National Institute of Food and Medication Surveillance of Colombia; the Center for State Control of Medication of Cuba; Chile's Institute of Public Health; Ecuador's National Institute of Tropical Hygiene and Medicine; Mexico's National Laboratory of Public Health; and Venezuela's Rafael Rangel's National Institute of Hygiene.

By establishing a regional network, PAHO is taking the countries of the Americas a step closer towards harmonizing regulatory activities, control procedures and methodologies, as well as developing standard reference reagents in the Region. These initiatives have received the support of the United States' Food and Drug Administration, the Agency for International Development (AID), and the World Health Organization (WHO).

A Technical Advisory Committee (TAC), with PAHO serving as its Secretariat was established in 1995 to monitor the activities of the RNVQCL. Within the network, emphasis is being given to the development and standardization of regional reference reagents, starting with those required for the control of vaccines now included in national immunization programs. The coordination of collaborative studies for each reference vaccine has been assigned to a specific NCL. These objectives will be supported at great length during the coming months by the implementation of an electronic network proposed by PAHO, linking all member laboratories and facilitating the exchange of experiences and results on research and development related to vaccine production and quality control methods.

Among other activities, the Regional Network plans to standardize and validate all the existing control methodologies that are part of the network, reinforce Good Laboratory Practices (GLP) in every activity at laboratories, and implement new quality control techniques, such as *in vitro* techniques to reduce the number of animals used in the control of the potency of anatoxins.

Reported Cases of Selected Diseases

Number of reported cases of measles, poliomyelitis, tetanus, diphtheria, and whooping cough, from 1 January 1995 to date of last report, and the same epidemiological period in 1994, by country.

Country/Territory	Date of last report	Measles				Polio		Tetanus				Diphtheria		Whooping Cough	
		Confirmed 1995			Confir-med			Non Neonatal		Neonatal					
		Labo-ratory	Clini-cally	Total	1994	1995	1994	1995	1994	1995	1994	1995	1994	1995	1994
Anguilla	30 Dec	0	0	0	0	0	0	...	0	...	0	...	0	...	0
Antigua & Barbuda	30 Dec	0	1	1	0	0	0	0	0	0	0	0	0	0	0
Argentina	30 Dec	8	202	210	134	0	0	31	32	5	11	3	3	1,183	1,497
Bahamas	30 Dec	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Barbados	30 Dec	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Belize	30 Dec	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bermuda	30 Dec	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Bolivia	30 Dec	0	80	80	1,441	0	0	...	...	20	21	4	5	30	45
Brazil	30 Dec	12	515	527	35	0	0	...	615	75	151	...	177	...	2,192
British Virgin Islands	30 Dec	0	0	0	0	0	0	...	0	...	0	...	0	...	0
Canada	30 Dec	2,301	...	2,301	308	0	0	3	3	...	0	2	0	6,652	10,166
Cayman Islands	30 Dec	0	0	0	0	0	0	...	0	...	0	...	0	...	0
Chile	30 Dec	0	0	0	0	0	0	11	12	0	1	2	4	424	218
Colombia	30 Dec	157	127	284	525	0	0	...	119	37	61	...	14	...	1,609
Costa Rica	30 Dec	14	73	87	0	0	0	5	3	0	0	0	0	5	20
Cuba	30 Dec	0	1	1	0	0	0	...	3	...	0	...	0	...	4
Dominica	30 Dec	0	0	0	0	0	0	...	...	...	0	...	...	...	...
Dominican Republic	30 Dec	0	0	0	3	0	0	9	52	0	5	14	4	0	4
Ecuador	30 Dec	...	916	916	3,668	0	0	...	89	28	57	124	568	133	562
El Salvador	30 Dec	0	0	0	0	0	0	3	10	3	9	0	0	4	12
French Guiana	07 Jan	...	...	...	...	0	0	...	...	...	...	...	...	...	...
Grenada	30 Dec	0	0	0	0	0	0	...	0	...	0	...	0	...	0
Guadeloupe	07 Jan	...	...	...	...	0	0	...	...	...	...	...	...	...	...
Guatemala	12 Aug	25	1	26	204	0	0	...	...	4	18	0	0	20	29
Guyana	30 Dec	0	0	0	0	0	0	0	...	0	0	0	0	0	0
Haiti	07 Jan	...	...	...	...	0	0	...	...	...	...	...	...	...	...
Honduras	30 Dec	1	0	1	3	0	0	7	19	3	10	0	0	0	3
Jamaica	30 Dec	0	7	7	0	0	0	9	6	0	1	0	2	7	5
Martinique	28 Jan	...	...	...	1	0	0	0	0	0	0	0	0	0	0
Mexico	30 Dec	12	134	146	128	0	0	118	140	62	80	0	0	16	324
Montserrat	30 Dec	0	0	0	0	0	0	...	0	...	0	...	0	...	0
Netherlands Antilles	07 Jan	...	...	...	...	0	0	...	...	...	...	...	...	...	...
Nicaragua	30 Dec	0	0	0	3	0	0	4	14	4	4	0	0	5	5
Panama	30 Dec	3	5	8	3	0	0	1	10	1	2	0	0	3	193
Paraguay	30 Dec	3	65	68	122	0	0	58	54	16	18	1	1	13	49
Peru	30 Dec	...	513	513	670	0	0	70	84	87	130	4	34	832	3,123
Puerto Rico	30 Dec	11	...	11	13	0	0	...	...	...	...	...	...	...	...
Saint Lucia	30 Dec	0	2	2	0	0	0	...	...	...	0	...	...	...	...
St. Kitts/Nevis	30 Dec	0	1	1	0	0	0	...	...	...	0	...	...	...	...
St. Vincent	30 Dec	0	0	0	0	0	0	...	1	...	0	...	0	...	0
Suriname	30 Dec	0	0	0	0	0	0	0	1	0	0	0	0	0	0
Trinidad & Tobago	30 Dec	0	0	0	0	0	0	0	0	0	0	0	0	0	5
Turks and Caicos	30 Dec	0	0	0	0	0	0	...	0	...	0	...	0	...	0
United States	30 Dec	288	...	288	958	0	0	30	29	...	0	0	1	3,869	3,590
Uruguay	30 Dec	0	5	5	0	0	0	0	2	0	0	0	0	2	0
Venezuela	30 Dec	30	38	68	15,364	0	0	65	73	17	14	0	0	375	808
TOTAL		**2,865**	**2,686**	**5,551**	**23,583**	**0**	**0**	**424**	**1,381**	**362**	**593**	**154**	**813**	**13,574**	**24,464**

... Data not available.

1996: Year of the Vaccine

Celebrating Edward Jenner

The global eradication of smallpox in 1979 led by PAHO/WHO brought to a conclusion efforts which had begun nearly two centuries earlier with the discovery of the smallpox vaccine by Edward Jenner, a country doctor practicing in south-west England. Dr. Jenner's discovery paved the way for future public health initiatives to control or eradicate other diseases. Noteworthy among these is the recent eradication of poliomyelitis from the Western Hemisphere in 1994. More importantly the successful smallpox eradication campaign confirmed that with political will, resources and the adequate application of existing technologies, diseases can be controlled or eradicated.

Edward Jenner inoculating his son against smallpox.
Source: *Medicine - an Illustrated History*

Smallpox, presumed to have developed at the same time as the first agricultural settlements arose in North-east Africa, China and the Indus Valley around 10,000 BC, was responsible for the decimation of entire populations. For centuries the practice of inoculation with the smallpox virus, or variolation, was carried out in Africa, China and India before being brought to Europe and the Americas in the 18th century. Dr. Jenner administered his first vaccination with cowpox on 14 May 1796, after hearing the story of a farmer that had inoculated his family with cowpox to protect them from contracting the deadly disease. Two years later the findings of his first trials were published, and by the early 1800s the smallpox vaccine was widely available. In the 19th century, smallpox vaccination was made compulsory in many countries of Europe. New developments in drying the vaccine also facilitated its transportation, especially in tropical countries.

Dr. Jenner's discovery became the first scientific attempt to control an infectious disease by means of a vaccine and is said to have laid the foundations of modern vaccinology. His discovery was followed 87 years later by Dr. Louis Pasteur's vaccine to treat rabies and those of Dr. Albert Sabin and Dr. Jonas Salk for controlling poliomyelitis during the 1950s. Their major scientific contributions will be commemorated worldwide during 1996, as the public health community celebrates the *Year of the Vaccine*.

Today, 3 million lives are saved annually by vaccines, which are increasingly being recognized as the most cost-effective strategy for preventing infant and childhood morbidity and mortality. Immunization programs are currently controlling major diseases in many parts of the world, such as: diphtheria, tetanus, yellow fever, pertussis, poliomyelitis, measles, mumps and rubella.

Following a 10 year international effort led by WHO, the last case of naturally occurring smallpox was reported in Merka, Somalia, on October 26, 1977. Two years later, a Global Commission for the Certification of Smallpox Eradication (GCCSE) concluded that global eradication of smallpox had been achieved.

The *EPI Newsletter* is published every two months, in Spanish and English by the Special Program for Vaccines and Immunization (SVI) 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.

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