

PD ABQ-350

97016

1997-000055

## *Progress Report*

### **Special Program for Vaccines and Immunization Pan American Health Organization**

**July 1997-December 1997**

United States Agency for International Development

Project Title: Accelerated Immunization Project: Measles Elimination

Project Number: 598-0825

Grant Number 598-0825-G-6-016-00

**Progress Report**  
**Special Program for Vaccines and Immunization**  
**July 1997 – December 1997**

**I. BACKGROUND**

- 1 **Project Title** Accelerated Immunization Project Measles Eradication
- 2 **Project Number** 598-0825
- 3 **Grant Number** 598-0825-G-6-016-00

A Results Package, which consists of a Strategic Objective and Intermediate Level Objectives, was elaborated to guide the development and strengthening of national vaccination programs, particularly in the eight USAID target countries. A set of indicators have been developed to monitor and evaluate progress achieved in the Strategic Objective and the Intermediate Results Indicators at both levels are

**1. Strategic Objective:**

More effective delivery of sustainable and high quality immunization services

**2. Intermediate Results:**

- 2.1 Strengthen policy environment related to immunization programs
- 2.2 Expanded and improved immunization delivery by the public and private sectors, including NGOs
- 2.3 Strengthen and support the measles surveillance system

## II PROGRESS REPORT

The following report presents 1997 year-end data for the indicators at the strategic and intermediate levels

### 1. Indicators at the Strategic Level

- **Percentage of Countries that Meet Sustainability Criteria**

*Sustainability indicators:*

During the XII TAG Meeting held in September 1997 in Guatemala, countries of the Region endorsed and agreed to use the following six indicators to monitor sustainability

- EPI Vaccination Coverage DTP3, OPV3, Measles, BCG, TT2 in women of childbearing age (WCBA)
- Program Access coverage with DTP1 and BCG
- Program Efficiency Drop-out Rate ( DTP1/DTP3 and DTP1/MEASLES)
- % total of immunization program costs financed by the country
- % total of recurrent costs financed by the country

Progress on these specific indicators are reflected throughout this Report

- **Countries finance recurrent costs of immunization program delivery**

Overall allocation of national resources toward national immunization programs and for recurrent costs are being monitored through the National EPI Plans of Action that have been prepared by the eight target countries (Table 1) In the case of Bolivia, the reduction was caused because for the past two years the salaries of health workers have not been included as a component of operational expenses in the National Plan of Action Bolivia has notably increased its national contribution for the procurement of biologicals and there has also been an increase in national resources toward the areas of cold chain and social mobilization In Nicaragua, the temporary reduction reflects higher donor contributions in 1997, to build and equip a new national biological warehouse and review cold chain operations at local centers The funds come from the World Bank, the local USAID office and Luxembourg

**Table 1**  
**Proportion of Funding from National Resources for the EPI Plans of Action,**  
**USAID Target Countries in the Americas, 1995-1997**

Country	1995	1996	1997
Bolivia	81%	60%	61%
Ecuador	86%	94%	96%
El Salvador	88%	95%	97%
Guatemala	70%	83%	
Haiti	19%	22%	25%
Honduras	78%	82%	81%
Nicaragua	74%	82%	79%
Peru	93%	91%	95%

Source: Country EPI Plans of Action  
 data not available

\* Data as of December 1997

As can be seen in Table 2 the proportion of recurrent costs financed by national resources continued to increase in several of the target countries which indicates the level of priority obtained by national immunization programs in the Region. There have been temporary reductions in these figures due to donations. In the case of Guatemala, final analysis of national vis-a-vis international resources is not available due to the restructuring of the Health Ministry. The government continues, however, to cover all recurrent costs.

**Table 2**  
**Proportion of Recurrent Costs Financed by National Resources\***  
**USAID Target Countries in the Americas, 1995-1997**

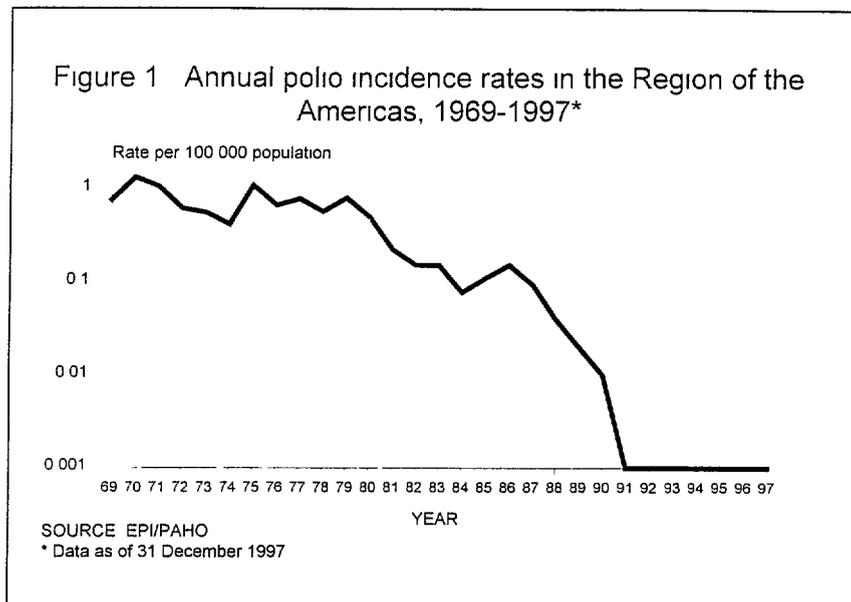
Country	1995	1996	1997
Bolivia	49%	72%	68%
Ecuador	69%	81%	77%
El Salvador	100%	100%	100%
Guatemala	100%	92%	
Haiti	19%	22%	25%
Honduras	78%	82%	96%
Nicaragua	67%	76%	78%
Peru	97%	99%	100%

\* Vaccines, syringes and cold-chain

Source: Country EPI Plans of Action

- **Number of polio cases**

Since August 1991 there have been no cases of wild poliovirus in the Region of the Americas (Figure 1) (Annex 2, *Poliovirus Surveillance Bulletin*, week ending 3 January 1998)



The Hemisphere continues to be free from wild poliovirus and surveillance indicators for the Region as a whole show that most countries are conducting adequate surveillance for acute flaccid paralysis (AFP) as shown in Table 3. The table below compares countries' fulfillment of AFP surveillance criteria in 1994, the year polio was declared eradicated, and in 1997. For the most part, countries have been consistent in maintaining AFP surveillance. However, the indicator measuring AFP rate  $\geq 1/100,000$  has declined sharply. This is an indication that fewer cases are being detected and entered into the surveillance system, which subsequently impacts the other surveillance criteria.

**Table 3**  
**AFP Surveillance Indicators, 1994 and 1997\***

Country	80% weekly reporting units		80% of cases investigated within 48 hours		80% of cases with 1 adequate stool sample		AFP rate $\geq$ 1 100 000 in children < 15 years	
	1994	1997	1994	1997	1994	1997	1994	1997
Argentina								
Bolivia								
Brazil								
Chile								
Colombia								
Costa Rica								
Cuba								
Dominican Republic								
Ecuador								
El Salvador								
Guatemala								
Haiti								
Honduras								
Mexico								
Nicaragua								
Panama								
Paraguay								
Peru								
Uruguay								
Venezuela								
<b>Total Countries</b>	<b>18</b>	<b>17</b>	<b>18</b>	<b>17</b>	<b>11</b>	<b>12</b>	<b>18</b>	<b>12</b>

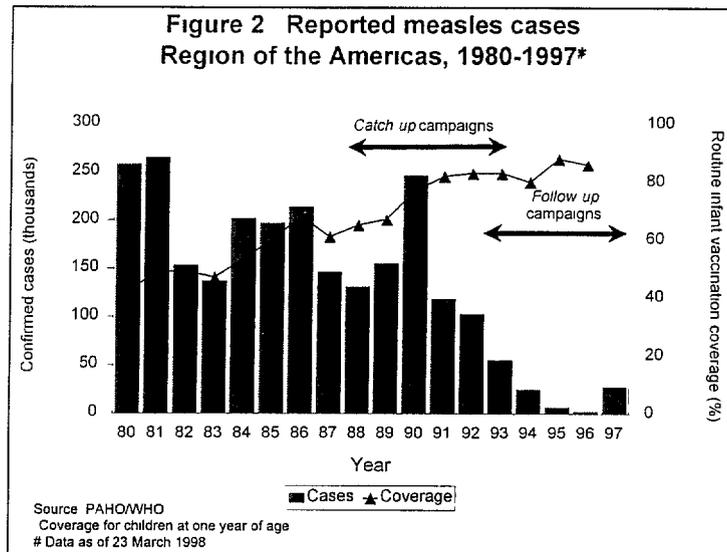
- Meet criteria

\* Data as of 3 January 1998 (Week 53)

Source SVI/PAHO (PESS)

- **Number of measles cases**

There was a resurgence of measles in 1997 in Brazil (Figure 2), following an all-time record Regional low in the Americas of 2 109 confirmed measles cases in 1996. As of March 20, 1998 a total of 89 445 suspected measles cases were reported from the countries of the Americas. Of these 27 798 (31%) have been confirmed, 34 290 (38%) have been discarded and 27 357 (31%) remain under investigation. Of the total confirmed cases 26 948 (97%) have laboratory confirmation of measles infection or epidemiological linkage to a laboratory confirmed case, and 850 (3%) have been confirmed on clinical grounds alone. Together, Brazil (26,348 confirmed cases) and Canada (570 confirmed cases) accounted for 97% of the total confirmed cases in the Region.

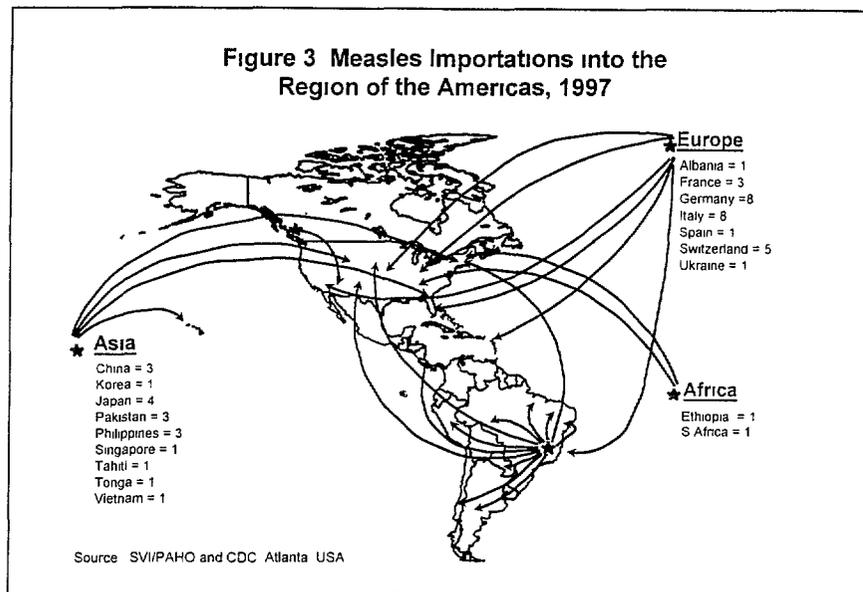


Other countries reporting laboratory and clinically confirmed measles cases in 1997 include Guadeloupe (116 cases), Peru (95), Paraguay (198 cases), Argentina (125 cases), Chile (61 cases), Costa Rica (26 cases), Bolivia (8), Colombia (43), Venezuela (27), Guatemala (8), Honduras (5), Bahamas (1), Trinidad and Tobago (1), Dominican Republic (1) and Uruguay (2). Countries with probable importations from the Brazilian outbreak are Argentina, Chile, Costa Rica, Paraguay, Peru and the United States (Table 4 and Figure 3).

**Table 4  
Countries with measles outbreaks in the Region of the Americas, 1997**

Country	Number of cases	Probable Source of Outbreak
Argentina	125	Brazil
Bahamas	1	?
Brazil	26,348	Europe
Canada	570	Indigenous
Chile	61	Brazil
Costa Rica	26	Brazil
Guadeloupe	116	Europe
Paraguay	198	Brazil
Peru	95	Brazil
Trinidad & Tobago	1	Italy
United States	135	Japan, Europe and Brazil

\*Data as of 31 December 1997



The majority of cases from Brazil were reported from Sao Paulo State the only state in the country that did not conduct a *follow-up* vaccination campaign in 1995. Over 50% of cases have occurred in young adults 20-29 years of age. The highest age-specific incidence rates are in infants, young adults 20 to 29 years of age and children 1-4 years of age, respectively. Over twenty-five measles-related deaths have been reported, most in infants less than 1 year of age.

An investigation of measles cases in adults found that the majority were occurring among young-adult members of certain risk-groups including men who recently migrated to cities from rural areas in the Northeast of the country to work in construction projects and other manual labor, students, health care workers, persons working in the tourist industry, and military recruits.

Measles virus has been isolated from several patients from this outbreak at the measles laboratory of the Adolfo Lutz Institute in Sao Paulo. Genomic sequencing of these isolates conducted at the Centers for Disease Control and Prevention (CDC), revealed that the virus circulating in Sao Paulo is virtually identical to virus currently circulating in Western Europe. Although an index imported measles case has not been identified, the molecular epidemiology data strongly suggest that the virus responsible for the Sao Paulo outbreak was imported from Europe.

The Sao Paulo outbreak is waning after implementation of an aggressive outbreak response, which included a *follow-up* campaign targeting all children 1-4 years old selective *mop-up* vaccination in schools and vaccination of young-adult members of groups at high-risk for measles. Over 4.5 million persons have been vaccinated.

Of the eight target countries, Haiti presents the largest threat of a large outbreak. Average routine coverage between 1994 and 1996 has been 25%. Table 5 presents the status of the eight target countries in their implementation of PAHO's recommended vaccination strategy for measles. As can be seen, Bolivia, Ecuador and Guatemala should conduct *follow-up* campaigns in 1998, and Haiti is overdue for their campaign.

**Table 5**  
**Measles Vaccination Campaigns in the 8 USAID Target Countries**

Region	Country/Territory	Campaign 1-14 ( <i>Catch-up</i> )		Average routine coverage 1994-1996 ( <i>Keep-up</i> )	Campaign 1-4 ( <i>Follow-up</i> )		Next <i>Follow-up</i> Due
		Year	Coverage (%)		Year	Coverage (%)	
Andean	Bolivia	1994	98	90			1998
	Ecuador	1994	100	70			1998
	Peru	1992	75	87	1995	97	1999
Central America	El Salvador	1993	96	89	1996	82	2000
	Guatemala	1993	85	73	1996	60	1998
	Honduras	1993	96	91	1996	85	2000
	Nicaragua	1993	94	81	1996	97	2000
Latin Caribbean	Haiti	1994	94	25			1998*

Data not available  
 - No campaign  
 \* Overdue  
 Last updated 21 January 1998

### Measles situation in Haiti

Haiti conducted a *catch-up* measles vaccination of the population 9 months through 14 years of age using a rolling approach from “departemant” to “departement” from October, 1994 through June 1995. Overall, 95% vaccination coverage was achieved. Although surveillance is incomplete, not a single suspected measles case has been confirmed since the campaign. Moreover, visits to hospitals throughout the island and discussions with health care workers strongly suggest that measles transmission has been interrupted on the island.

Since the campaign, however, routine measles vaccination coverage has been poor. While precise figures are not available, it is estimated that the annual measles vaccine coverage among children 12-23 months of age has been only 23-28%. Based on this coverage, it is estimated that by the end of 1998, there will be over 900,000 children less than 5 years of age who are susceptible to measles. This represents over 3 birth cohorts who are not protected against measles. When measles virus is re-introduced into Haiti, the large number of susceptible children will likely result in a large measles outbreak with up to 180,000 measles cases and perhaps 2,000 deaths. In addition to low measles population immunity, there is also low immunity to polio among children born since the last campaign.

An emergency *follow-up* measles vaccination campaign needs to be conducted as soon as possible. The number of susceptible children is increasing every day as is the risk of a measles outbreak. Other antigens, especially polio vaccine, should be included in this campaign. Long-term efforts need to be made to improve the routine vaccination infrastructure in Haiti. It will be very difficult to maintain the absence of measles virus circulation in Haiti if the overwhelming majority of infants every year do not receive measles vaccine. Measles surveillance data are incomplete. However, the sentinel surveillance system proposed by PAHO and Institut Haitien de l'enfance may provide the basis for developing effective measles and acute flaccid paralysis surveillance. Although the national measles laboratory appears capable of performing measles IgM testing, it

will be extremely difficult to maintain this laboratory, if only 5-9 specimens are tested each year. The CAREC measles laboratory will need to collaborate closely with the national measles laboratory in Haiti to assure high quality measles testing.

## **Recommendations**

The resurgence of measles in the Americas during 1997 represents a major increase compared to cases reported in 1996, still these cases are only about 10% of cases in 1990. The outbreak in Brazil has become a wake-up call to all countries of this Hemisphere to demonstrate that the absence of measles virus circulation does not mean absence of risk from measles infection. Important lessons are being drawn to *fine-tune* the Region's measles eradication strategy. Countries are being alerted through various channels that the successful completion of the measles eradication goal will require the implementation of PAHO's recommended vaccination strategy in full in all countries of the Region.

The two major challenges to the Region's measles eradication goal by the year 2000 are

- Countries of the Americas need to keep up their guard by maintaining the highest population immunity possible in infants and children and targeting vaccination to adolescents and young adults who are at highest risk for exposure to measles virus.
- Increased efforts are needed in other regions of the world to improve measles control and to decrease the number of exported measles cases to the Americas.
- **<1/1000 cases of neonatal tetanus in newborns in every district.**

In 1996, the Region of the Americas achieved the goal established by WHO for the elimination of NNT as a public health problem. Preliminary data for 1997 for the Region shows continued decline in the number of cases (Figure 4), as in the number of districts with multiple cases. Elimination efforts are focused on high-risk areas that have cases, with emphasis in Ecuador, Honduras and Peru.

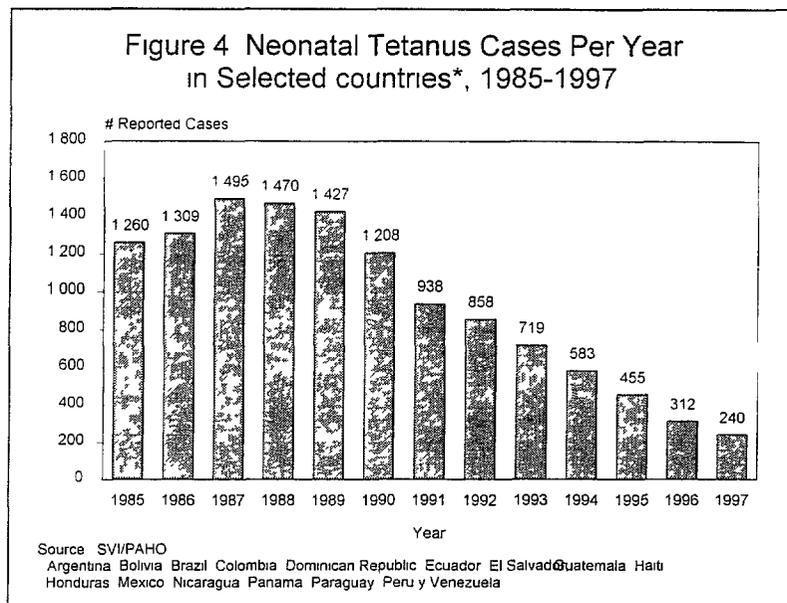


Table 6 below presents an analysis of WCBA in seven of the eight target countries, which are part of the 16 NNT endemic countries in the Americas. Under the category of “High-Risk Areas”, the WCBA are divided into two groups. The first group includes all the WCBA currently living in high-risk areas which have reached the maintenance phase, meaning they have achieved the WHO goal of <math><1/1000</math> cases of NNT per municipality. Vaccination with tetanus toxoid is carried out through routine immunization services. The second category includes WCBA living in high-risk areas which have not achieved the WHO goal for NNT elimination, and therefore more intensive immunization activities are needed.

**Table 6  
Women of childbearing age (WCBA) living in high-risk areas in 7 USAID target countries, 1996**

Country	Total WCBA	High-Risk Areas		
		Total WCBA	Maintenance Phase	Attack Phase
El Salvador	1,154,657	1,025,025	949,335	75,690
Guatemala	2,493,041	1,149,640	520,794	628,846
Honduras	1,463,150	770,599	577,921	192,678
Nicaragua	1,293,099	602,166	437,432	164,734
Bolivia	1,632,983	767,997	479,181	288,726
Ecuador	2,966,130	828,236	452,583	375,653
Peru	6,272,949	3,472,655	2,256,487	1,216,168

Based on the results of these evaluations, PAHO has recommended that countries continue improving epidemiological surveillance and case investigations in high-risk areas of endemic countries, particularly in those from which information on coverage and cases is lacking. Vaccination of all WCBA in these risk areas will be essential to continue controlling the disease. In this regard, emphasis should also be given to the complete elimination of missed opportunities to vaccinate and especially monitor protection from tetanus in mothers when children receive their first dose of DPT. Furthermore, criteria of high-risk areas need to be

standardized and disseminated Migration should be factored in when determining areas and populations at risk and training of midwives will be necessary to guide in assisting patients in completing their vaccination schedule

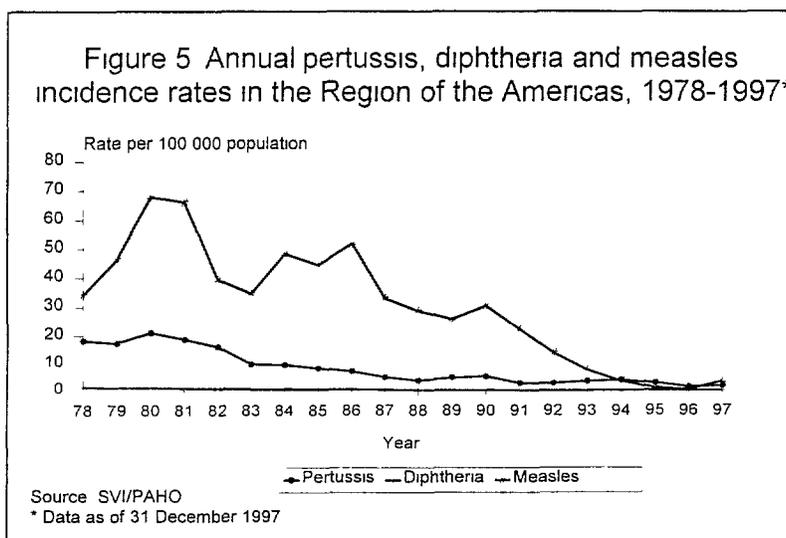
- **Number of cases/deaths due to diphtheria, pertussis and tuberculosis meningitis**

As can be seen in Table 7, vaccination programs continued to have considerable impact on vaccine-preventable diseases In terms of measles and meningitis tuberculosis morbidity, there were important improvements in some of the eight target countries

**Table 7**  
**Morbidity Data in 8 USAID Target Countries, 1996-1997\***

Country	Diphtheria		Pertussis		Measles**		Tetanus		Neonatal Tetanus		Meningitis Tuberculosis	
	1996	1997	1996	1997	1996	1997	1996	1997	1996	1997	1996	1997
Bolivia	1	3	14	138	7	8	22	11	14	8		
Ecuador	22	19	163	245	42	0	88	39	36	25	103	12
Peru	4	2	355	989	105	95	57	63	46	36	24	
El Salvador	0	0	3	2	1	0	10	4	5	2	20	4
Guatemala	0	1	66	567	1	8	2	5	12	6	16	2
Honduras	0	0	200	160	4	5	20	10	4	1	8	3
Nicaragua	0	0	14	84	0	0	10	14	1	1	2	0
Haiti	0	0		0	1	0		0		33		
Total	27	25	815	2 185	161	116	209	146	118	112	173	21

Data not available  
 \* 31 December 1997  
 \*\* Includes laboratory and clinically confirmed cases  
 Source: Country Reports



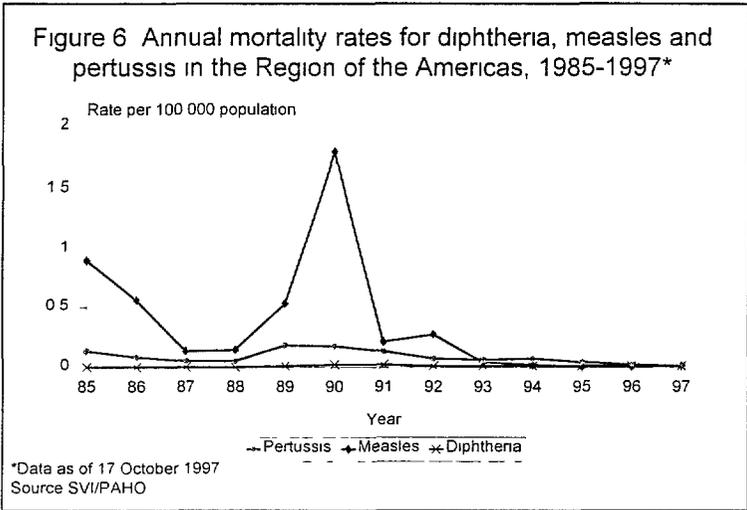
There was an increase in the morbidity and mortality of pertussis in the Region due to outbreaks in Guatemala and Brazil. The pertussis outbreak of Guatemala started late 1997 and is affecting primarily indigenous populations in the Department of Quiché, that live in geographical isolation. Contributing factors to this outbreak include a large number of susceptibles due to low vaccination coverage and the prolonged absence of *Bordetella pertussis* in an isolated community with relatively low population morbidity. Factors contributing to the high case-fatality rate, shown in Table 8, include malnutrition, especially among children under 5, poor hygiene and crowded conditions. Control measures have been implemented which include a change in the vaccination schedule for DPT. The first of 3 doses was moved forward from 2 months to 1 month, and intervals between vaccination were moved from 2 months to every 4 weeks. Following the initiation of the outbreak, vaccination with DPT was performed house-to-house in all communities. As the outbreak developed and because of the control measures, there was a reduction in the number of cases among infants and young children.

The outbreak in Brazil also affected indigenous communities in the state of Acre.

**Table 8**  
**Mortality Data in 8 USAID Target Countries, 1996-1997\***

Country	Diphtheria		Pertussis		Measles		Tetanus		Neonatal tetanus	
	1997	1996	1997	1996	1997	1996	1997	1996	1997	1996
Bolivia	2	0	0	0	0	0	4	0	4	1
Ecuador	0	0	2	0	0	0	6	3	12	14
El Salvador	0	0	0	0	0	0	2	2	1	1
Guatemala	0	0	32		4	0			6	7
Haiti	0	0	0		0	0	0			
Honduras	0	0	12	8	0	0	6	12	0	4
Nicaragua	0	0	3	0	0	0	5	10	0	1
Peru	0	0	0	4	0	0	4	13	22	21
Total	2	0	49	12	4	0	27	54	45	49

Source: Country Reports  
\* Data as of 31 December 1997



- 90% of vaccination coverage with all EPI core antigens in children <1 year of age.

Of the six indicators measuring progress toward the Strategic Objective, key is the one related to 90% coverage with each EPI antigen among children under 1 year of age in the target countries. This indicator proves that each cohort of children is being protected against the targeted diseases. Data for 1996, shown in Table 9 demonstrate that Honduras, Nicaragua, El Salvador and Peru had reached this goal or were close to reaching it. Data for 1997 is not complete, but the same trend is expected.

**Table 9**  
**Vaccination Coverage in 8 USAID Target Countries**  
**1996-1997\***

Region/Country	DPT		OPV		Measles		BCG	
	1996	1997*	1996	1997*	1996	1997*	1996	1997*
Bolivia	81.66	67.00	82.14	68.00	98.00	94.00	98.02	82.00
Ecuador	87.45	75.00	89.00	77.00	78.87	74.00	99.00	94.00
Peru	99.00	88.00	99.00	88.00	86.76	81.00	99.00	94.00
El Salvador	97.51	97.00	96.21	96.00	96.02	97.00	99.00	93.00
Guatemala	72.76	78.00	73.17	78.00	69.50	74.00	76.50	84.00
Honduras	93.49	93.00	94.16	95.00	91.18	95.00	99.00	99.00
Nicaragua	90.67	94.00	99.27	99.00	89.98	94.00	99.00	99.00
Haiti								

Data not available \* provisional data as of 31 December 1997

**Table 9a**  
**Vaccination Coverage in the Americas**  
**1997\***

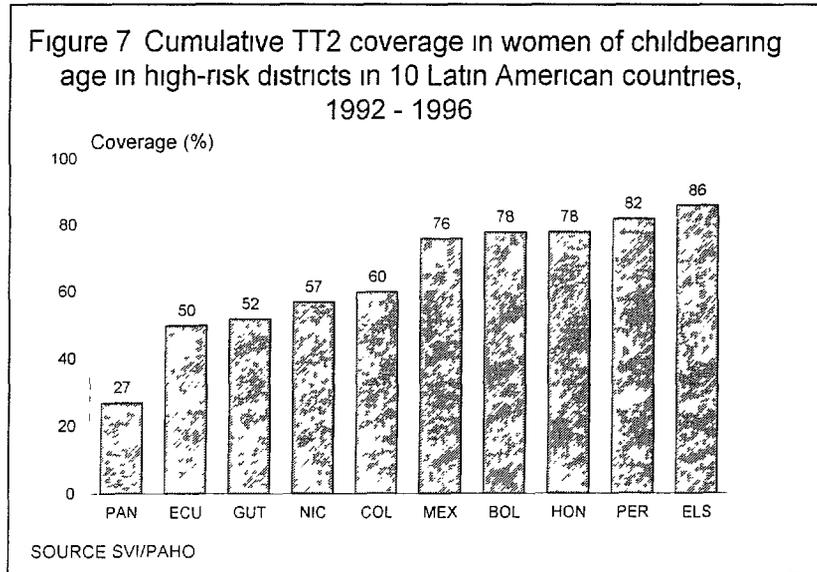
Region/Country	Population	DPT-3	OPV-3	BCG	Measles#
<b>Andean</b>					
Bolivia	230,246	67	68	82	94
Colombia	893,469	84	85	98	76
Ecuador	295,898	75	77	94	74
Peru	589,405	88	88	94	81
Venezuela	561,035	55	72	79	63
<b>Brazil</b>					
Brazil	3,161,042	48	59	80	71
<b>Central America</b>					
Belize	7,460	85	85	95	85
Costa Rica	81,357	96	99	92	99
El Salvador	160,023	97	96	93	97
Guatemala	360,558	78	78	84	74
Honduras	187,726	93	95	99	95
Nicaragua	147,813	94	99	99	94
Panama	60,354	95	99	99	92
<b>English-Speaking Caribbean</b>					
Anguilla	168	99	99	99	95
Cayman Islands	602	95	96	86	92
Grenada	2,036	95	95	-	92
Guyana	20,952	88	89	94	82
Jamaica	57,370	90	90	97	88
Montserrat	118	86	87	70	76
St Vincent & Grenadines	2,297	99	99	-	99
Turks & Caicos	350	99	99	99	99
British Virgin Islands	320	99	96	99	99
<b>Latin Caribbean</b>					
Cuba	152,261	98	96	85	99
Dominican Republic	241,102	76	75	95	78
<b>Mexico</b>					
Mexico	2,069,993	94	94	99	89
<b>North America</b>					
Bermuda	830	91	94	-	88
<b>Southern Cone</b>					
Paraguay	154,464	67	67	75	46
<b>TOTAL</b>	<b>9,432,878</b>	<b>72</b>	<b>77</b>	<b>89</b>	<b>78</b>

\* **Provisional data**  
- No report

# Measles data are based on MMR data reported for the following countries  
Colombia, Cuba  
The Caribbean, Belize, Bermuda

- **90% of coverage with TT2 in women of childbearing age in high-risk areas**

Data for 1997 will be available at the end of March and forwarded to USAID



- **All vaccines used in immunization programs meet WHO standards**

With the goal of assuring the quality of vaccines used in the Region, SVI/RDV has established a Regional Network of Vaccine Quality Control Laboratories with the participation of the National Control Laboratories (NCLs) of the eight DTP-producing countries (Argentina, Brazil, Chile, Cuba, Colombia, Ecuador, Mexico and Venezuela). This Network is promoting the implementation of the six basic functions of a National Control Authority and is providing participating laboratories with back-up services for their regular functions, as well as working as an external quality control system.

Activities have included the development of regional reference reagents and reference vaccines, as well as the harmonization of quality control methodologies. Among the collaborators are also the United States Food and Drug Administration (FDA) and Canada's Bureau of Biologics from the Drug Directorate. During 1997, a network of National Control Authorities was organized with the participation of 12 countries. The main function of this network will be the harmonization of all regulatory activities related to vaccines. Both networks are fundamental for assuring that vaccines used in national immunization programs are of known quality. Computer systems were purchased and participating laboratories were connected to a communication network that facilitates the exchange of information among themselves and also with PAHO.

Also in the area of quality control, SVI continued to support the program of Certification of Vaccine Producers, which guarantees that vaccines produced in the Region follow

international regulations and Good Manufacturing Practices (GMP) This certification program was initiated with visits to the DTP-producing facilities in Mexico, Chile and the Instituto Butantán, Brazil Workshops on GMP and validation were held to train personnel from the vaccine-producing laboratories and to prepare GMP inspectors at National Control Authorities This program is being extended to other vaccines being produced in the Region, like BCG, rabies measles polio and hepatitis B

PAHO's EPI Revolving Fund has and will also continue playing a critical role in ensuring high-quality vaccines at a low cost in the Region

## 2 Indicators at the Intermediate Level

### 2.1 Improved Policy Environment Relating to Vaccination Programs

- **Number of Inter-agency Meetings per Quarter/per Country with Agenda and Minutes**

Table 10 shows the number of inter-agency meetings held during 1996 and 1997 that included agendas, minutes and final decisions. The frequency of meetings under the ICC umbrella has decreased. Nevertheless, inter-agency meetings are taking place on a regular basis. In this context, SVI/PAHO is collaborating with the Ministries of Health to mobilize resources at the national level and on technical aspects as described in this report. Given the changing policy environment, PAHO has also intensified its dialogue with countries to continue a high level of coordination of national and international efforts in the field of immunization so that program goals are met in all areas of a country.

**Table 10**  
**Inter-agency Coordinating Committee Meetings in the Americas**  
**1995-1997**

Country	No of meetings held*			Financial monitoring of Plan		
	1995	1996	1997	1995	1996	1997
Bolivia	8	6	4	Yes	Yes	Yes
Ecuador	3	4	2	Yes	Yes	Yes
El Salvador	4	3	3	Yes	Yes	Yes
Guatemala	5	2	0	Yes	Yes	No
Haiti	12	6	6	No		Yes
Honduras	3	3	3	Yes	Yes	Yes
Nicaragua	4	4	3	Yes	Yes	Yes
Peru	4	4	0	Yes	Yes	Yes
<b>Total</b>	<b>38</b>	<b>32</b>	<b>21</b>			

*Source:* Country Reports

\* All meetings had agendas, minutes and decisions

- **Countries with National Plans of Action**

PAHO has provided support to all USAID target countries in preparing National Immunization Plans of Action for 1996 and 1997. These plans are available at the PAHO office in Washington, D.C.

- **Number of NGOs that participate or are represented at ICC meetings.**

Table 11

Country	No NGOs that support EPI		No NGOs that participate in ICC	
	1996	1997	1996	1997
Bolivia	68	68	13	12
Ecuador	13	13	6	6
El Salvador	40	40	30	30
Guatemala	7	10	0	0
Haiti	18	18	7	7
Honduras	20	20	10	11
Nicaragua	20	20	5	8
Peru	10		0	

No Data

- **Percentage of Countries with Vaccine Legislation to Finance Procurement of Vaccines and Syringes**

In 1996, the Andean Parliament and in July 1997, the PARLATINO (Latin American Parliament) passed resolutions calling on all countries in the Region to establish specific budget lines for national immunization activities that would assure the payment for vaccines, syringes and needles required for national immunization programs. To date Venezuela and Ecuador have won congressional approval of a Vaccine Law. SVI, together with the Public Policy and Health unit of the Division of Health and Human Development is providing technical assistance to other countries to ensure that similar laws are enacted elsewhere.

- **Percentage of Countries with National Advisory Committee on Immunization Practices**

Bolivia, Nicaragua and Peru are working to establish a National Advisory Committee on Immunization Practices. Guatemala and El Salvador are also initiating the process of setting up a committee on immunization practices.

- **Number of Countries with Private Sector Participation in Promoting and Implementing Immunization Policy**

Countries still lack appropriate means to systematically coordinate and collect information on private sector participation. Their participation continues to be primarily in promotion, social mobilization and training. Data available for Nicaragua show that in 1996, 9% of the population was vaccinated by the private sector, this figure increased to 16% in 1997.

**Table 12**  
**Number of doses of vaccine given by the private sector in Nicaragua, 1996-1997**

Year	Population < 1 year	BCG	DPT			OPV			Measles	Total doses
			1 <sup>st</sup> dose	2 <sup>nd</sup> dose	3 <sup>rd</sup> dose	1 <sup>st</sup> dose	2 <sup>nd</sup> dose	3 <sup>rd</sup> dose		
1996	138,336	3,447	1,730	1,086	835	1,982	1,450	1,076	1,220	12,826
1997	147,813	4,995	3,556	2,177	1,527	4,069	2,765	2,066	2,250	23,355

## 2.2 Missed Opportunities Reduced by 10%

**Table 13**  
**Missed Opportunities Studies and Follow-Ups in Priority Countries**

Country	Year of study	Missed opportunities (%)	Year of follow-up	Missed opportunities (%)
Bolivia	1990	32	<b>1998</b>	
Ecuador	1989	34	--	
El Salvador	1989		<b>October 1998</b>	
Guatemala	1990	50.5	<b>1998</b>	
Honduras	1988	45.1	1997	
Nicaragua	1987	66.0	1995	21% (< 2 years) 13% WCBA
Peru	1990	52.0	1995	9%

Source: EPI Country Reports  
 Data not available

## 2.3 Strengthening and support of the measles surveillance system and other vaccine-preventable diseases

- **Regional Network of Reference Laboratories consisting of 10 laboratories for confirmation of Measles Diagnosis**
- **% of Samples Received at Laboratories are Properly Investigated**
- **% of all Reporting units in all Countries Report the Weekly Presence or Absence of Measles Cases**
- **% NGO Participating in Weekly Surveillance System**

### Laboratory

The Regional Reference Laboratories have received the necessary material and computers to function effectively. During the period under review a total of US\$ 41,655 of laboratory supplies were provided to regional reference laboratories, and towards improving laboratory diagnostic capabilities in the USAID target countries.

# ANNEXES

**Annex 1**  
*Measles Weekly Bulletin, Volume 3, Number 53*



**PAN AMERICAN HEALTH ORGANIZATION  
PAN AMERICAN SANITARY BUREAU REGIONAL OFFICE OF THE  
WORLD HEALTH ORGANIZATION**



*Special Program for Vaccines and Immunization  
Expanded Program on Immunization  
Measles Surveillance in the Americas*

*Weekly Bulletin for the week  
ending 3 January 1998*

Vol 3 No 53

*Suspected Reported Cases by State, 1997*

*Lab Confirmed Cases by State, 1997*

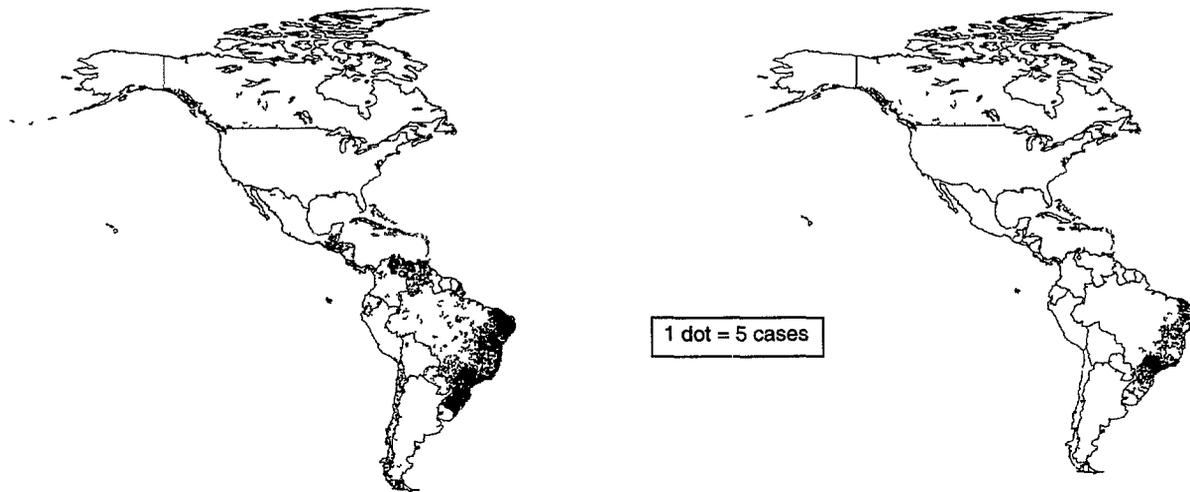


Table No 1  
Classification of Suspected Measles Cases  
for the period 97/01 - 97/53

Region	Country	Reported Cases	Under Investigation	Discarded			Confirmed			Total Confirmed Last Year	
				Rubella	Dengue	Other/Unknown	Clinic	Lab	Total		
AND	BOL	155	49	0	0	105	0	1	1	7	
	COL	132	30	15	0	77	5	5	10	160	
	ECU	126	43	17	0	66	0	0	0	42	
	PER	163	150	1	0	11	1	0	1	105	
BRA	VEN	1190	89	57	42	984	15	3	18	89	
	BRA	70365	22309	0	0	21736	450	25870	26320	580	
CAP	COR	133	23	0	0	95	3	12	15	24	
	ELS	307	7	98	0	202	0	0	0	1	
CAR	GUT	279	160	49	0	68	0	2	2	1	
	HON	112	13	10	4	79	5	1	6	4	
	NIC	329	6	86	5	232	0	0	0	0	
	PAN	675	27	0	0	648	0	0	0	0	
	CAR	992	32	281	8	669	0	2	2	4	
	LAC	CUB	171	42	0	0	129	0	0	0	0
		DOR	124	10	0	0	113	0	1	1	0
	MEX	FGU									
		GUA	174	0	0	0	58	0	116	116	13
		HAI	2	0	0	0	2	0	0	0	1
MAR											
NOA	PUR	0	0	0	0	0	0	0	0	8	
	MEX	227	73	99	0	55	0	0	0	180	
SOC	CAN	580	0	0	0	0	0	580	580	327	
	USA	135	0	0	0	0	0	135	135	489	
	ARG	366	19	0	0	289	10	48	58	59	
URU	CHI	1094	475	75	0	490	0	54	54	0	
	PAR	200	0	0	0	76	0	124	124	13	
	URU	2	1	1	0	0	0	0	0	2	
<b>TOTAL</b>		<b>78033</b>	<b>23558</b>	<b>789</b>	<b>59</b>	<b>26184</b>	<b>489</b>	<b>26954</b>	<b>27443</b>	<b>2 109</b>	

No report received

*Special Program for Vaccines and Immunization  
Expanded Program on Immunization  
Measles Surveillance in the Americas*

*Weekly Bulletin for the week  
ending 3 January 1997*

*Vol 3 No 53*

Table No 2  
Measles Suspect Cases Under Investigation for the period 97/01 - 97/53

Region	Country	Cumulative 1997	Weeks																
			1-4	5-8	9-12	13-16	17-20	21-24	25-28	29-32	33-36	37-40	41-44	45-48	49	50	51	52	53
AND	BOL	49	0	0	1	0	2	6	2	4	4	1	33	1					
	COL	30	5	3	4	6	7	2		1	2								
	ECU	43	4	3	3					6	3	4	6	6	8				
	PER	150	69	44	26	7	2			1	1								
BRA	VEN	89	1	0	2	6	4	14	10	6	9	4	12	13	4	3	1		
	BRA	22309																	
	COR	23																	
	ELS	7	1	1	1		1		1			1					1		
CAP	GUT	160	1	8	21	34	40	25	6	4	4	10	2	2	2	1			
	HON	13	0	0							1	1	2	4	3	2			
	NIC	6	0	2	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	PAN	27																	
CAR	CAR	32	1	2		1		1			2	2	7	6	3	3	1	3	
	LAC	42	0	0	0	0	0	0	0	0	0	0	0	0					
	DOR	10	0	0	0	0	0	0	0	0	0	0	0	0			0	0	0
	FGU	0																	
MEX	GUA	0			0														
	HAI	0																	
	MAR	0																	
	PUR	0																	
NOA	MEX	73	4	4	8	9	17	5	9	4	2	6	3	2					
	BER	0																	
	CAN	0																	
	USA	0																	
SOC	ARG	19	0	0	0	0	0	0	0										
	CHI	475	0	0	0	0	0	0	2	14	31	60	86	196	56	18	11	0	1
	PAR	0			2	1						17	33	33	10				
	URU	1										1	0						
TOTAL		23558	86	67	70	65	74	53	37	56	92	123	161	232	69	27	13	3	1

No report received

Table No 3  
Measles Surveillance Indicators for the period 97/01 - 97/53

Region	Country	% Sites Reporting Weekly	% Cases Investigated ≤48 Hours	% Cases W/Complete Inves Form	% Cases W/ Adequate Sample	% Lab Results ≤7 Days
AND	BOL	86	94	82	88	44
	COL	50	73	60	64	57
	ECU	90	88	82	97	53
	PER		96	99	98	6
	VEN	84	85	85	89	63
BRA	BRA					
	COR					
	ELS		97	89	98	92
	GUT	99	92	80	83	39
CAP	HON	86	93	92	96	17
	NIC	98	98	96	100	50
	PAN					
	CAR	99	95	68	90	99
LAC	CUB	97				
	DOR	83	100	0	0	
	FGU					
	GUA					
MEX	HAI	87				
	MAR					
	PUR					
	MEX		99	95	93	8
NOA	BER					
	CAN					
	USA					
	SOC		93			
SOC	ARG	99	98	61	72	52
	CHI		90	77	91	73
	PAR		0	50	100	
	URU					
TOTAL		88	93	77	87	70

No report received

**Annex 2**  
*Polio Weekly Bulletin, Volume 12, Number 53*



**PAN AMERICAN HEALTH ORGANIZATION**  
 PAN AMERICAN HEALTH SANITARY BUREAU REGIONAL OFFICE OF THE  
 WORLD HEALTH ORGANIZATION



Vol 12, No 53

*Expanded Program on Immunization  
 Poliomyelitis Surveillance in the Americas*

*Weekly Bulletin for the week  
 ending 3 January 1998*

**Poliovirus Surveillance**

**POLIO HAS BEEN ERADICATED FROM THE AMERICAS**

**The last wild poliovirus was detected on September 5 1991, in Peru**

Table No 1  
 Status of Case Stool Sample Analysis  
 Last 52 Weeks (97/01 - 97/53)

Lab	Country	Total*	WITHOUT RESULTS			ENTEROVIRUS ISOLATION					
			Not yet in Lab	<10 weeks	>10 weeks	% Isolation	Negative	Other Enterovirus	Pending	Poliovirus Vaccine	Wild
BEL	BRA	61	7	8	1	11.1	40	5	0	0	0
CAR	DOR	21	1	0	0	20.0	16	4	0	0	0
	HON	42	0	9	0	21.2	26	7	0	0	0
	JAM	1	0	0	0	100.0	0	1	0	0	0
	SUR	1	0	0	0	0.0	1	0	0	0	0
	TRT	3	0	0	0	0.0	3	0	0	0	0
CDC	ELS	2	0	0	0	100.0	0	0	0	2	0
	GUT	1	0	0	0	100.0	0	0	0	1	0
	MEX	3	0	0	0	100.0	0	0	0	3	0
FIO	BOL	49	10	8	1	20.0	24	3	0	3	0
	BRA	146	21	8	0	14.5	100	13	1	3	0
	PER	76	16	0	3	22.8	44	12	0	1	0
INC	COR	7	3	0	4	0.0	0	0	0	0	0
	ELS	36	6	0	8	31.8	15	7	0	0	0
	GUT	67	5	10	5	31.9	32	15	0	0	0
	NIC	43	3	5	0	11.4	31	4	0	0	0
	PAN	8	5	0	0	0.0	3	0	0	0	0
INDRE	MEX	391	0	21	6	17.6	300	64	0	0	0
INH	VEN	91	1	2	0	12.5	77	11	0	0	0
INS	COL	171	9	9	16	9.5	124	11	0	2	0
	ECU	48	12	3	1	3.1	31	1	0	0	0
MAL	ARG	10	0	0	0	10.0	9	1	0	0	0
	CHI	35	0	0	25	0.0	10	0	0	0	0
	PAR	9	3	1	0	60.0	2	1	1	1	0
	URU	5	1	0	1	33.3	2	1	0	0	0
REC	BRA	84	22	1	3	6.9	54	4	0	0	0
<b>TOTAL</b>		<b>1411</b>	<b>125</b>	<b>85</b>	<b>74</b>	<b>16.2</b>	<b>944</b>	<b>165</b>	<b>2</b>	<b>16</b>	<b>0</b>

\* Each sample relates to an individual

Case samples only

Table No 2  
 Status of Poliovirus Pending Intratypic Differentiation  
 Last 52 Weeks (97/01 - 97/53)

LAB	COUNTRY	POLIOVIRUS												TOTAL	
		NOT YET IN LAB				IN LAB < 4 Weeks				IN LAB > 4 Weeks					
		P1	P2	P3	MIX	P1	P2	P3	MIX	P1	P2	P3	MIX		
	PAR	0	1	0	0	0	0	0	0	0	0	0	0	0	1
FIO	BRA	0	0	0	0	0	1	0	0	0	0	0	0	0	1
<b>TOTAL</b>		<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>

Case samples only



# Acute Flacid Paralysis Surveillance

Vol. 12, 53

**Table No 1**  
**CASES OF ACUTE FLACCID PARALYSIS UNDER INVESTIGATION**  
**BY WEEK OF REPORT**

SITE	TOTAL 1996	CUM 1997	WEEKS																
			1-4	5-8	9-12	13-16	17-20	21-24	25-28	29-32	33-36	37-40	41-44	45-48	49	50	51	52	53
ARG	2	19	2	11	1	4	1	0	0	0	0	0	NR	NR	NR	NR	NR	NR	
BOL	1	24	0	0	0	0	2	3	5	6	0	3	2	0	0	0	0	0	
BRA	22	269	8	13	29	28	24	22	25	19	25	26	24	17	4	4	1	0	
CAN	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	
CAR	3	12	0	0	0	2	1	1	2	0	2	1	1	2	0	1	0	0	
CHI	0	28	0	0	0	0	0	0	1	4	3	5	6	9	0	0	0	NR	
COL	10	103	2	2	8	5	7	12	9	6	9	11	16	11	3	1	1	0	
COR	8	11	0	1	1	1	1	0	1	0	0	4	0	1	1	0	0	NR	
CUB	0	32	6	3	5	2	2	3	6	0	1	2	2	0	0	0	0	NR	
DOR	0	2	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	
ECU	0	27	0	1	0	0	0	2	1	4	1	7	4	2	0	3	1	0	
ELS	2	21	0	1	0	0	1	2	4	3	4	3	1	2	NR	NR	NR	NR	
GUT	0	39	0	0	0	0	3	2	1	8	8	6	10	1	0	0	NR	NR	
HAI	1	0	0	0	0	NR	NR	NR	NR	NR									
HON	0	9	0	0	0	0	0	0	0	0	0	0	3	6	0	0	0	0	
MEX	0	96	1	0	0	2	0	1	3	6	15	21	36	11	0	NR	NR	NR	
NIC	0	10	0	0	0	0	0	0	0	0	0	0	2	6	0	2	0	0	
PAN	0	8	1	0	0	0	0	2	0	1	1	0	0	2	1	0	0	0	
PAR	0	2	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	NR	
PER	0	27	2	0	3	0	0	0	3	1	0	3	5	2	3	0	2	1	
URU	5	2	0	0	1	0	0	0	0	0	0	0	1	NR	NR	NR	NR	NR	
USA	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	
VEN	1	13	0	0	0	0	0	0	0	0	1	1	5	3	3	0	0	0	
TOTAL	55	753	22	32	49	44	42	50	59	60	70	93	120	75	16	12	5	1	3

NR - No report received

**Table No 2**  
**CASES OF AFP REPORTED, RATE PER 100,000 <15 yrs,**  
**% INVESTIGATED WITHIN 48 hrs., % WITH 1 ADEQUATE**  
**SAMPLE AND % OF SITES REPORTING WEEKLY**  
**AS OF WEEK 53**

SITE	TOTAL		CUMULATIVE				
	CASES 1996	RATE 1996	CASES 1997	RATE 1997*	% INV <48 hrs	%1 Sample+	% Report
ARG	41	0.42	20	0.20	80	20	0.0
BOL	42	1.31	49	1.50	90	73	84.7
BRA	460	0.87	375	0.69	84	55	90.7
CAN	NR	-	-	NR	-	-	-
CAR	20	0.75	11	0.41	73	9	-
CHI	76	1.88	75	1.82	92	83	99.8
COL	243	2.11	175	1.49	89	86	82.9
COR	8	0.73	11	0.99	82	55	96.7
CUB	24	1.06	31	1.35	97	97	97.5
DOR	18	0.66	21	0.76	86	90	87.7
ECU	47	1.07	50	1.12	92	82	90.9
ELS	59	2.53	38	1.60	92	95	95.4
GUT	49	1.17	69	1.62	86	57	82.3
HAI	1	0.04	0	0.00	0	0	-
HON	44	1.92	42	1.80	95	83	80.0
MEX	556	1.69	413	1.23	99	77	93.6
NIC	35	1.97	45	2.49	98	100	98.5
PAN	9	1.07	8	0.93	63	88	92.8
PAR	19	1.10	10	0.57	100	80	91.1
PER	103	1.18	84	0.94	96	82	92.4
URU	5	0.64	7	0.88	100	57	-
USA	NR	-	-	NR	-	-	-
VEN	103	1.36	92	1.20	97	93	83.8
TOTAL♦	1962	1.20	1626	0.98	92	74	89.9

\* Adjusted + Taken within 14 days of onset of paralysis  
 ♦ Excluding Canada and USA

**Table No 3**  
**CONFIRMED CASES OF POLIOMYELITIS**  
**BY WEEK OF ONSET**

SITE	TOTAL 1996	CUMULATIVE	
		1996	1997
ARG	0	0	0
BOL	0	0	0
BRA	0	0	0
CAN	0	0	0
CAR	0	0	0
CHI	0	0	0
COL	0	0	0
COR	0	0	0
CUB	0	0	0
DOR	0	0	0
ECU	0	0	0
ELS	0	0	0
GUT	0	0	0
HAI	0	0	0
HON	0	0	0
MEX	0	0	0
NIC	0	0	0
PAN	0	0	0
PAR	0	0	0
PER	0	0	0
URU	0	0	0
USA	0	0	0
VEN	0	0	0
TOTAL	0	0	0

CAR Includes reports from all CAREC member countries

**Table No 4**  
**POLIO COMPATIBLE CASES**  
**BY WEEK OF ONSET**

SITE	TOTAL 1996	CUMULATIVE	
		1996	1997
ARG	0	0	0
BOL	0	0	0
BRA	14	14	0
CAN	0	0	0
CAR	0	0	0
CHI	0	0	0
COL	0	0	0
COR	0	0	0
CUB	0	0	0
DOR	0	0	0
ECU	0	0	0
ELS	0	0	0
GUT	1	1	5
HAI	0	0	0
HON	0	0	0
MEX	6	6	1
NIC	0	0	0
PAN	0	0	0
PAR	0	0	0
PER	0	0	0
URU	0	0	0
USA	0	0	0
VEN	1	1	2
TOTAL	22	22	8

CAR Includes reports from all CAREC member countries

**Annex 3**  
*Measles News from SVI Website*



# Measles News

- [About measles](#)

- **Current**

- **Outbreaks**

- [São Paulo, Brazil](#)

- [Costa Rica](#)

- ["Follow-up"](#)

- **Campaigns**

- 

- **Recommendations**

- [TAG XII](#)

- [Caribbean](#)

- **Meeting**

- [Measles Graphs](#)

- [Measles Weekly](#)

- **Bulletin**

- [\(English version](#)

- [only\)](#)

- **View/Download:**

- [Case](#)

- [Investigation Form](#)

- (PDF file,

- size:9.7 Kb)

## Measles in the Americas, 1997

Following an all-time record Regional low in the Americas of 2,109 confirmed measles cases in 1996, there has been a resurgence of the disease in 1997 in Brazil. Through 2 January 1998 (epidemiological week 53), a total of 78,033 suspected measles cases were reported from the countries of the Americas. Of these, 27,443 (35.2%) have been confirmed, 27,032 (34.6%) have been discarded, and 23,558 (30.2%) remain under investigation. Of the total confirmed cases, 26,954 (98.2%) have laboratory confirmation of measles infection or epidemiological linkage to a laboratory confirmed case, and 489 (1.8%) have been confirmed on clinical grounds alone. Together, Brazil (26,320 confirmed cases) and Canada (577 confirmed cases) accounted for 98.0% of the total confirmed cases in the Region. However it should be pointed out that Canada has had no cases for the last 18 weeks. Other countries reporting measles cases include Guadeloupe (128 cases), the United States (135 cases), Paraguay (124 cases), Argentina (58 cases), Chile (54 cases), and Costa Rica (15 cases).

The majority of cases from Brazil were reported from Sao Paulo State, the only state in the country which did not conduct a *follow-up* vaccination campaign in 1995. To date, over 20,000 cases have been confirmed in this outbreak, with most cases in the city of Sao Paulo. Over 50% of cases have occurred in young adults 20-29 years of age. The highest age-specific incidence rates are in infants, young adults 20 to 29 years of age and children 1-4 years of age, respectively. Over twenty-five measles-related deaths have been reported, most in infants less than 1 year of age. An investigation of measles cases in adults found that the majority were occurring among young adults who were members of certain risk-groups including men who recently migrated to cities from rural areas in the Northeast of the country to work in construction projects and other manual labor, students, health care workers, persons working in the tourist industry, and military recruits.

Measles virus has been isolated from several patients from this outbreak at the measles laboratory of the Adolfo Lutz Institute.

in Sao Paulo Genomic sequencing of these isolates conducted at the Centers for Disease Control and Prevention (CDC) Atlanta, USA, revealed that the virus circulating in Sao Paulo is virtually identical to virus currently circulating in Western Europe Although an index imported measles case has not been identified, the molecular epidemiology data strongly suggest that the virus responsible for the Sao Paulo outbreak was imported from Europe

The Sao Paulo outbreak is waning after implementation of an aggressive outbreak response, which included a *follow-up* campaign targeting all children 1-4 years old, selective *mop-up* vaccination in schools and vaccination of young-adult members of groups at high-risk for measles Measles virus spread from Sao Paulo to nearly every other state in Brazil States most affected include Rio de Janeiro, Ceara, Minas Gerais, Bahia, Parana, Rio Grande do Sul, Mato Grosso do Sul and the Federal District (Brasilia) Moreover, spread has been reported from several other countries in the Region, including Paraguay, Chile, Argentina, Peru, Costa Rica, and the United States

A total of 577 confirmed measles cases were reported from Canada A large outbreak with over 300 cases occurred primarily among young adults affiliated with Simon Fraser University, near Vancouver This outbreak came somewhat as a surprise since the Province of British Columbia had just completed its school *catch-up* campaign in 1996 Genomic analysis of measles virus obtained from this outbreak performed at the Laboratory Centres for Disease Control suggests that measles virus was imported from Europe Measles virus from the British Columbia outbreak spread to school-aged children in Alberta, where 245 cases were reported Other sporadic cases or small clusters have occurred in various Canadian provinces, mostly among adults due to importations Since 1996, a total of 17 imported measles cases were documented in Canada, mostly from Europe and Asia Since the end of July 1997, however, not a single measles case has been detected and transmission appears to have been interrupted in Canada

To date, 135 confirmed measles cases have been reported during 1997 in the United States This is the lowest number of cases ever reported in the United States, and is well below half the previous record low incidence of 309 cases in 1995

Almost half of the cases are documented importations. Spread from importations has been limited and the largest outbreak this year is only 8 cases. In 1995 and 1996, there were no measles importations from Latin America or the Caribbean. In 1997, however, there were 5 confirmed imported cases from Brazil.

Between October 1996 and May 1997, a large measles outbreak occurred in the French department of Guadeloupe. This island had not implemented PAHO's recommended measles eradication strategy. A total of 128 confirmed measles cases were reported. The majority of cases occurred in unvaccinated persons 12 to 18 years of age. The source of the outbreak is thought to be an unvaccinated 10 year old child visiting from metropolitan France. Moreover, genetic analyses of measles virus obtained from the outbreak revealed that the virus circulating in Guadeloupe is very similar to virus circulating in Europe. The Ministry of Health conducted a mass vaccination campaign in affected schools. Efforts were made to provide measles vaccine to all students without documentation of having received two doses of measles vaccine. Over 3,000 students were vaccinated.

Until 1997, the English-speaking Caribbean had not reported a single confirmed case of measles in over 5 years. However, in 1997 two laboratory-confirmed measles cases were detected. The first confirmed case was reported from the Bahamas. The patient, a young adult, had rash onset in March. The direct source of transmission was not identified, however, it is strongly suspected that the patient contracted measles from a tourist. A search has been made in the country to identify any additional cases of measles. This search involved a review of over 80,000 diagnoses from health facilities in the country. The second case was reported from Trinidad and Tobago. It occurred in a young adult Italian sailor who had rash onset in April. The patient had acquired measles in Italy. A specimen was collected and found to be positive for measles IgM at the measles laboratory of the Caribbean Epidemiology Centre (CAREC). No spread cases were identified despite careful investigation.

**Note:** For more information please refer to EPI Newsletter, Vol 19, No 6 - December, 1997

● [Return to SVI](#)

**Annex 4**  
*Final Report of the 14<sup>th</sup> Meeting of Caribbean EPI Managers*



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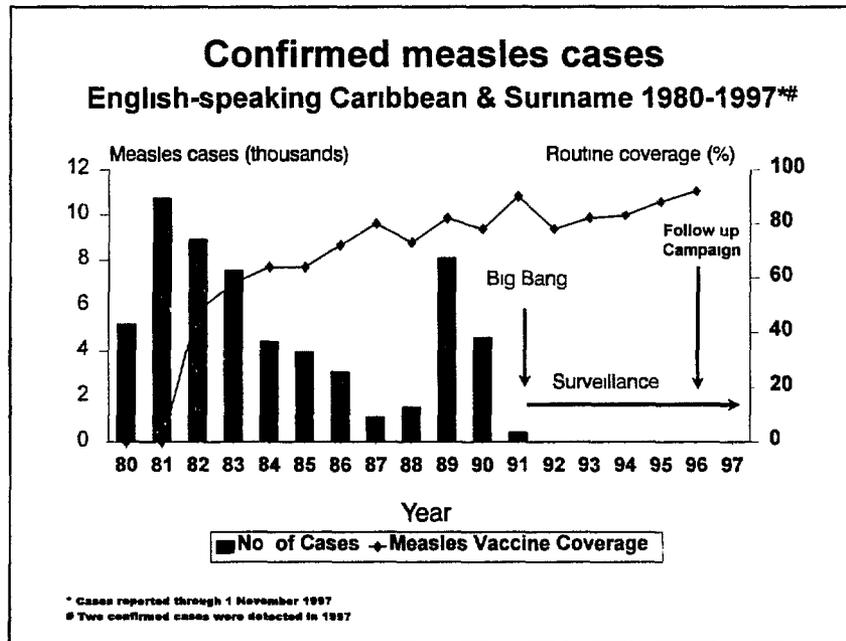
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IN REPLY REFER TO

**Special Program for Vaccines and Immunization**

**Fourteenth Meeting of Caribbean EPI Managers**

*Final Report*



**Castries, Saint Lucia**  
**18 to 20 November 1997**

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## **I. Introduction**

The Fourteenth Meeting of the Caribbean EPI Managers was held in Castries, Saint Lucia, from 18-20 November 1997. The Meeting was officially opened by Her Excellency the Governor General of Saint Lucia, Dr Pearlette Louisy, and The Honorable Minister of Health, Ms Sarah Flood delivered a keynote address. Dr Peter Figueroa, Chief Medical Officer at the Ministry of Health in Jamaica chaired the plenary sessions, and Dr Ciro A de Quadros, Director of PAHO's Special Program for Vaccines and Immunization, served as Secretary.

The Meeting brought together over 70 health officials from 20 countries of the English-speaking Caribbean, Aruba, Suriname, Haiti, and the French Departments of Guadeloupe and Martinique. Also present were representatives from the Laboratory Center for Disease Control (LCDC), Ottawa, Canada, the United States' Centers for Disease Control and Prevention (CDC), PAHO's Caribbean Epidemiology Center (CAREC), UNICEF, the Children's Christian Fund (CCF), as well as technical staff from PAHO's Special Program for Vaccines and Immunization (SVI).

The English-speaking Caribbean still holds the longest record in the Western Hemisphere of six years without indigenous measles transmission, although two recent importations into the Bahamas and Trinidad and Tobago stressed the danger of importations and the need for adherence to the measles elimination strategies, particularly the maintenance of high levels of immunization coverage and the periodic implementation of *follow-up* campaigns, as recommended by PAHO. The large outbreak in Guadeloupe, due to a direct importation from France in late 1996, illustrates the vulnerability of countries to measles transmission if the strategies are not fully implemented. Presentations on the maintenance of the Region's polio-free status emphasized the importance of continuing the countries' high degree of political commitment to surveillance and vaccination activities to keep the region polio free. The Bahamas implemented a major campaign with MMR targeting all individuals 4-40 years old to interrupt rubella transmission. The lessons from this initiative will be extremely useful for all other countries that are planning to eliminate rubella and congenital rubella syndrome (CRS). Although progress is being made towards the global eradication of poliomyelitis, importations still represent the biggest threat to the Caribbean's polio-free status. The efforts of the countries towards the introduction of new vaccines into national immunizations programs was updated.

## **II. Objectives of the Meeting**

The main objectives of the Meeting included the review of the EPI program in the participating countries to identify obstacles which might impede achieving program targets. As performed every year, country reports and the 1997 National Work Plans were reviewed and analyzed and the 1998 National Work Plans were elaborated including its cost components. The epidemiological situation and control/eradication activities related to poliomyelitis, measles, rubella and that of congenital rubella syndrome (CRS) in the Caribbean were thoroughly reviewed by meeting participants.

### **III. Conclusions and Recommendations**

#### **1. Rubella and CRS Control/Elimination Strategies in the Caribbean**

Significant rubella virus activity has been recorded in many CAREC-member countries since 1982, and cases of congenital rubella have been documented as sequelae to these outbreaks. Subsequent to the "BIG BANG" *catch-up* measles vaccination campaign, which was conducted in the sub-region during 1991, very low rubella incidence rates—fewer than 2.0 cases per 100,000 population—were recorded between 1992 and 1995. Beginning in 1995 and continuing through 1997, sizable outbreaks of rubella have occurred in Jamaica, Barbados, Trinidad and Tobago, Guyana, and Belize. Rubella incidence rates of 10.3 cases per 100,000 population were recorded in 1996.

A prototype surveillance system for CRS, including case definitions, case investigation forms and reporting algorithms was developed and disseminated in 1996 to all CAREC-member countries. Not unexpectedly, cases of CRS have occurred in Jamaica, Barbados, Trinidad and Tobago, Belize, Guyana and Suriname, for a total of 20 cases to date in 1997. The epidemiological details related to these cases have been captured through the newly introduced surveillance system. Subsequent to the cost-benefit and cost-effectiveness analyses undertaken at the 1996 meeting of the Caribbean EPI Managers, preliminary studies were conducted in Guyana, Trinidad and Tobago, Barbados and Jamaica to document the cost burden of CRS in the populations. The direct costs associated with CRS, which include acute care for physician and hospital services, long-term care, institutional care; and special educational care are much higher than the cost of prevention. For example, in Guyana, it has been estimated that the lifetime cost for prevalent and incident cases of CRS between 1992 and 1997 is US\$ 1.9 million. Barbados estimated that the cost of treating CRS cases in the next 15 years would be US\$ 5.5 million, compared with US\$ 1.1 million for an elimination initiative. Such costs are eminently avoidable if the populations were protected against rubella.

In response to the emerging rubella situation and within the context of already planned *follow-up* measles vaccination campaigns, and following recommendations of the 13<sup>th</sup> Meeting of the Caribbean EPI Managers held in 1996, the Bahamas initiated a MMR vaccination campaign for its population aged 4 to 40 years aimed at the interruption of rubella transmission. Although this campaign is still ongoing, coverage rates to date are in the order of 78%, representing a first in the world effort. Trinidad and Tobago and Barbados are initiating plans to vaccinate both males and females between the ages of 15 and 45 years and 20-39 years.

Technical officers responsible for the EPI within Ministries of Health together with national epidemiologists should collate and analyze relevant epidemiological data related to rubella and CRS morbidity and mortality, present levels of vaccination coverage stratified by age, direct and indirect costs related to CRS, and the real as well as the opportunity costs of adopting different vaccination strategies. Such findings should be presented to the political directorate so that they can be appropriately informed and sensitized to the situation, in order to adopt a national policy.

***Participants at the Meeting concluded:***

- ***It is imperative that Ministries of Health discuss and arrive at a consensus position with regard to the objective of rubella elimination.***
- ***There is overwhelming evidence, both from estimated figures as well as from data collected over the last year, particularly in Guyana, Barbados and at a regional review presented by CAREC, that the burden of rubella and its cost, both in financial terms and human suffering, warrants efforts towards its elimination.***
- ***The last Technical Advisory Group Meeting that met in Guatemala in September, 1997 outlined the strategies for the elimination and control of rubella and CRS. These include a one-time mass vaccination of all individuals—male and female—within a certain age range that will vary from country to country, but will have to cover necessarily up to 35 year olds. The lower level age group will be defined by previous vaccination activities that included rubella-containing vaccine.***
- ***During 1998, senior MOH officials and political leaders in all countries should define a national policy regarding rubella and CRS elimination, aiming at a Pan-Caribbean initiative in this regard. The conference of Ministers of Health, in April 1998, their Caucus in September 1998 and the current revision of the Caribbean Cooperation in Health (CCH) represent excellent opportunities for achieving consensus on this issue.***

**Rubella and CRS elimination in the United States**

The United States has established a goal to eliminate indigenous rubella and CRS by the year 2000. The incidence of rubella and CRS has decreased by more than 99% since the introduction and application of rubella vaccine. While the incidence of rubella has decreased for all age groups, the decrease has been more pronounced in preschool and school-aged children. As a result, the proportion of cases reported among adults has increased, although the actual incidence among adults continues to decrease.

Rubella surveillance is critical for the elimination effort. Currently, demographic information, vaccination status, transmission setting, case classification, laboratory results and pregnancy status are requested for each case. The proportion of cases for which all information is available (as stated above) and the proportion of cases that are laboratory confirmed will serve as surveillance indicators. The indicators have shown progressive improvement, with 80% of requested information reported and more than 90% of cases laboratory confirmed in 1996.

Recently, molecular epidemiology has begun to be used as a tool for rubella surveillance, as it has been for measles surveillance. The goal is to use molecular epidemiology to identify the different rubella virus strains associated with each outbreak or isolated case and attempt to determine the usual geographic spread of each strain. Determining the spread of each strain will

help in improving strategies for rubella elimination in the United States and other interested countries

## 2. Measles Elimination

### 2.1 English-speaking Caribbean & Suriname

The “Big-Bang” measles *catch-up* campaign was conducted in 1991 throughout the English-speaking Caribbean and Suriname. Vaccine coverage in this campaign was over 92% 1991 has been the year of highest MMR/measles vaccine coverage, and except for a decrease in 1992 (See Graph in cover page), there has been a steady increase.

*Follow-up* campaigns, a critical component of PAHO’s measles elimination strategy have been conducted in most countries since 1995. The purpose of these campaigns is to reduce the number of susceptible pre-school-age children. In total, 15 countries have completed their *follow-up* campaign. The age range of the target population was 1 to 5 years in nine (9) countries. The target population ranged from age 1-6 years in Trinidad and Tobago to 4-40 years in the Bahamas, where a campaign was conducted for both measles and rubella elimination (Table 1)

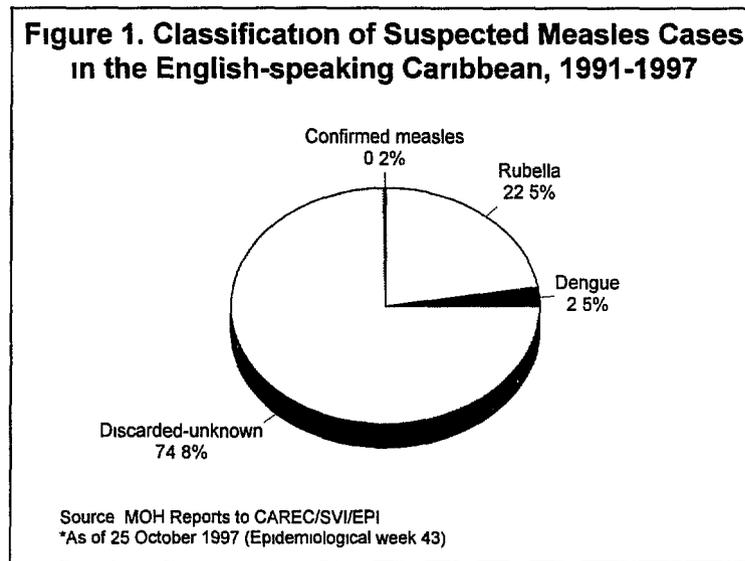
**Table 1**  
**Status of *Follow-Up* Campaign 1995-1997**  
**English-speaking Caribbean and Suriname**

Country	Year of campaign	Target pop.	Age range target pop.	% Population vaccinated	Vaccine used
Anguilla	1996	1,097	1-15 yrs	100	MMR
Antigua	1996	6,208	1-2 yrs	92	Measles
Bahamas	1997	100,000	4-40 yrs	78	MMR
Barbados	1996	19,054	1-5 yrs		Measles
Bermuda	<b>No Campaign</b>				
Belize	1995	25,258	1-5 yrs	85	Measles
British Virgin Islands	1996	292	4-15 yrs	90	MR/MMR
Cayman Islands	<b>No Campaign</b>				
Dominica	1996		2-10 yrs	≈ 100	MMR
Grenada	1996	10,620	1-5 yrs	81	MMR
Guyana	1996	84,839	1-5 yrs	90	MMR
Jamaica	1995-6	497,009	1-10 yrs	95	MMR
Montserrat	1996	735	4-10 yrs	100	MMR
St Kitts & Nevis	1996	3,060	1-5 yrs	100	MMR
St Lucia	1996	9,000	2-5 yrs	85	Measles
St Vincent	1995	10,860	1-4 yrs	84	MMR
Suriname	<b>Campaign Slated for December, 1997</b>				
Trinidad & Tobago	1997	120,000	1-6 yrs	96	MMR
Turks & Caicos	1996	1,410	1-5 yrs	95	MMR

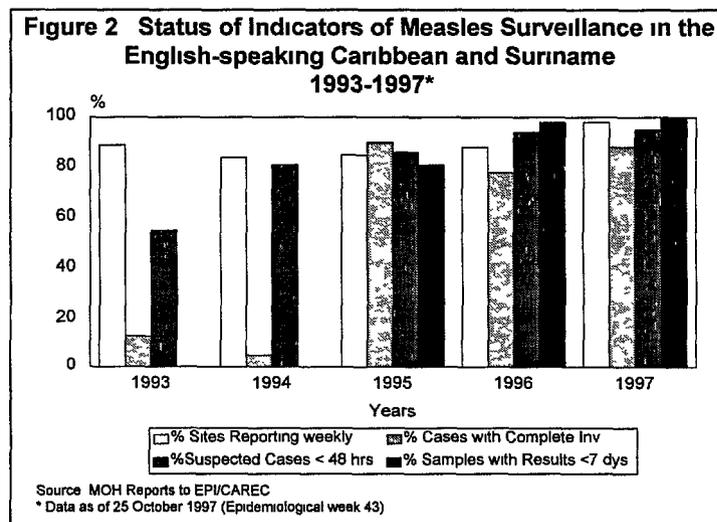
In Suriname, a *follow-up* campaign has started in the interior, and one is scheduled for the coastal area in December 1997

## Measles Surveillance

Careful measles surveillance is another critical component of PAHO's measles elimination strategy. Measles surveillance was implemented in the countries since 1991. The reporting sites in countries increased gradually from 468 in 1991 to over 600 in 1997. The system has been functioning well and the classification of over 3,000 suspected cases reported since then is shown in Figure 1.



In order to monitor and assess the surveillance system, a set of indicators were designed. During 1993-1997, there has been steady improvement in the performance of these indicators (Figure 2).



Presently, over 90% of sites report weekly, and 89% of all suspected cases have complete investigation with an adequate blood specimen collected. The "first contact" strategy has been implemented by most countries. Many health providers have been sensitized and trained,

resulting in an improvement of case investigation activities, and therefore in the surveillance indicators. Ninety-five percent of cases in 1997 have been investigated within 48 hours, compared to 79% in 1996, and 65% of investigation forms have been complete in 1997.

Three thousand one hundred and twenty-five (3,125) suspected measles cases were reported during 1991 to 1997 (week 43). Of these, 2,202 cases were discarded with four laboratory confirmed cases of measles (two in 1991 and two in 1997), all due to importations, and 57 classified as clinically confirmed. The clinically confirmed cases represent a failure of the surveillance system.

In 1996, four hundred and seventy-one (471) suspected measles cases were notified. As of week 43 (25 October) in 1997, 862 suspected cases have already been notified. The suspected cases range from 2 months to 50 years of age, with 61% between the age of 2 months to 14 years, and 38% between 15 and 50 years.

The first confirmed case was reported from the Bahamas. The patient, a young adult, had rash onset in March, but a blood specimen was not received at CAREC until a month after being collected. Direct source of transmission was not identified, however, it is strongly suspected that the patient contracted measles from a tourist. A search was carried out in the country to identify any additional measles cases. This involved a review of over 80,000 diagnoses from health facilities in the country.

The second case was reported from Trinidad and Tobago, which occurred in a young-adult Italian sailor who had rash onset in April. The patient had acquired measles in Italy. The patient received care in a private sector clinic, and it was this provider who made the preliminary diagnosis and notification. A specimen was collected and tested positive for measles IgM at CAREC. No spread cases were identified despite a careful investigation.

### **Laboratory Support**

The measles laboratory at CAREC provides laboratory confirmation for suspected measles cases. The laboratory is able to test for IgM antibodies for measles, rubella and dengue. Through week 44 of 1997, a total of 874 specimens were submitted for laboratory confirmation. Of these, 2 (0.2%) were positive for measles, 276 (31.5%) were positive for rubella and 11 (1.3%) were positive for dengue. All specimens were tested and reported back to countries within seven days of receipt.

## **Measles Outbreak in Guadeloupe**

Between October 1996 and May 1997, a large measles outbreak occurred in the French department of Guadeloupe. This island had not implemented PAHO's measles elimination strategy. A total of 128 confirmed measles cases were reported. The majority of cases occurred in unvaccinated persons 12 to 18 years of age. The source of the outbreak was thought to be an unvaccinated 10 year-old child visiting from Europe. Moreover, genetic analysis of measles virus obtained from the outbreak revealed that the virus circulating in Guadeloupe is very similar to virus circulating in Europe. In response to the outbreak, the Ministry of Health conducted a mass vaccination campaign in affected schools, reaching 3,000 students. Efforts were made to provide measles vaccine to all students without documentation of having received two doses of the vaccine.

## **Measles Outbreak in Brazil**

Information from the current measles outbreak in Brazil was presented and discussed. As of November 15, over 17,000 measles cases were confirmed. The largest number of cases have been reported from Sao Paulo. Most cases are occurring among unvaccinated young adults and infants under 12 months of age. Measles virus has spread from Sao Paulo to other states in Brazil and several other countries in the Region.

A detailed investigation of measles in young adults in Rio de Janeiro county found that the majority of cases were occurring in members of certain risk-groups including young adults, particularly men, who recently migrated to urban areas from rural areas to work on construction projects, students, health care workers, persons working in the tourist industry, and military recruits.

The outbreak appears to be waning, following the implementation of an aggressive response, which included a *follow-up* campaign targeting all children 1-4 years old, and *mop-up* vaccination in all schools aimed at unvaccinated students and high-risk adult groups.

**It must therefore be emphasized once again that:**

- *MR or MMR are the vaccines of choice for measles and rubella elimination.*
- *Countries that are instituting a two-dose schedule should be aware that even with such a regimen, susceptibles will accumulate because coverage with two doses will never achieve 100% and some children will remain without any dose. Follow-up campaigns are necessary to maintain interruption of transmission.*
- *To maintain the English-speaking Caribbean and Suriname free of measles, high vaccination coverage must be maintained. Efforts need to be made to ensure that at least*

*95% of each birth cohort is vaccinated with measles-containing vaccine at 12 months of age.*

- *The possibility of combining measles and rubella surveillance should be explored.*
- *To prevent the accumulation of susceptible preschool-aged children from reaching dangerous levels, follow-up campaigns should be conducted among children 1-4 years every four years. Countries should plan on conducting follow-up campaigns in the year 2000.*
- *The Brazil experience suggests that certain young adults may be at risk for measles. Efforts are needed to assure measles vaccination in young adults in high-risk groups, which include students, migrant workers, health care workers and the military.*
- *As long as measles circulates anywhere in the world, the English-speaking Caribbean will be at risk for measles importations. Measles surveillance systems will need to detect these importations in a timely manner and respond accordingly when they occur.*

## **2.2 Measles Elimination in Canada and the United States**

### **a. Canada**

Despite 97% measles vaccine coverage of 2 year olds, the number of measles cases reported increased significantly in 1995, due mostly to an outbreak in Ontario. It was estimated that over 20,000 cases might have occurred in 1996 if no action was taken, and without a *catch-up* program, giving a second dose of measles containing vaccine would not eliminate measles outbreaks for another 10-15 years. In August 1995, the National Advisory Committee on Immunization strongly recommended the routine administration of a second MMR dose, as well as the implementation of school *catch-up* campaigns to administer a first or second doses of measles vaccine to all children and adolescents. Subsequently, all provinces/territories have now introduced a routine second MMR/MR vaccination at either 18 months or 4-6 years. Also six provinces/territories representing 80% of the population completed a mass *catch-up* program for all school-aged children. A more limited *catch-up* program was also started in two other provinces. Finally, a *catch-up* program involving all children in grades 1 through 9 was started in April 1997 in Alberta. Altogether, over 4 million children have been immunized through these campaigns. In the three provinces (representing 7% of the population) that have not yet implemented *catch-up* campaigns, there still remain school-aged susceptible populations in sufficient numbers to fuel outbreaks through importations.

For 1997, as of mid November, 577 cases of measles were reported. As a result of importation, an outbreak started to develop in the adult population in British Columbia which had completed its school *catch-up* campaign in 1996. This outbreak spread to school aged children in Alberta before this province had started its catch up campaign.

As a result of importations, other sporadic cases or small clusters have occurred in Canada mostly among adults. Since 1996, a total of 17 importations were documented, mostly from Europe and Asia. Since the end of July, 1997—for the last 15 weeks—no measles case has been detected and transmission seems to have been interrupted.

**b. *United States***

As of November 7 of 1997, 124 confirmed cases of measles have been reported in the United States, an annual incidence of less than one case per two million population. This is the lowest ever in the United States, and is well below half the previous record low incidence. Almost half of these cases are documented importations. Although there are roughly as many importations in 1997 as in 1996, the overall number of cases has markedly decreased. In 1996, importations resulted in several moderate outbreaks especially among school children who had not received a second dose of measles vaccine. In 1997, spread from importations has been limited, and the largest outbreak has eight cases. In 1995 and 1996 there were no importations from Latin America or the Caribbean. There were four confirmed imported cases from Brazil in July of 1997, and one imported case from Brazil in August 1997 is under investigation.

The reasons for decreased incidence are the increased on-time delivery of the first dose of measles vaccine, increased coverage with two doses of vaccine among school children and decreased importations from the Americas. Following the resurgence of measles in 1989-1991 in the United States, which resulted in over 55,000 cases and 120 deaths, immunization programs began to focus intensively on on-time delivery of the first dose of measles vaccine. Several major changes were implemented including a vaccine funding program which allowed federal funds to pay for vaccines administered in the private sector, linking of vaccination status with social welfare programs, measuring coverage at the clinic level and promoting systems to identify and contact defaulters. This has resulted in the highest-ever measles vaccine coverage with a first dose by two years of age which has remained at 90% since 1994.

Measles surveillance is a critical component of the United States Measles Elimination Strategy. To continue improving the surveillance system, key surveillance indicators are monitored for each state immunization program.

In summary, the United States is committed to continue working towards the elimination of measles by focusing on the timely delivery of the first dose of measles vaccine, accelerating second dose coverage of school children, vaccinating adults in high-risk settings, continually improving surveillance systems and working with other countries to promote global measles eradication.

### 3. Polio Eradication

The expected rate of AFP cases was deemed at 1 case per 100,000 population of children less than 15 years of age. To maintain this rate, the countries of the region need to report 26 cases annually. A total of 26 cases were reported in 1995, 25 in 1996, and 12 by week 43 in 1997.

Systematic reporting has been sent in from all the countries. In 1996, all countries except Dominica reported weekly. The 26 cases were notified from 7 countries. Antigua and Bahamas met all four criteria and Guyana and Trinidad and Tobago met three.

In 1997 as of week 43, 12 cases were reported from six countries. All countries reported. Two countries met all four criteria—Belize and Guyana, while the other four countries met two criteria. The indicator that seems most problematic is investigation within 48 hours. This indicator is crucial and needs to be met.

The age range of cases was five months to 43 years in 1996, while in 1997, it was nine months to 32 years. Most cases (88%) in 1996 and 1997 were less than 15 years of age. This means that about three cases are older than 15 years.

- *It is commendable that all cases with stool specimens are sent for laboratory testing. However, the other three critical surveillance indicators are not consistently being met from countries notifying cases. At week 43 -1996, 16 cases were reported compared to the present 12 cases.*
- *Periodic evaluation of surveillance for AFP is necessary at all major health facilities to see if cases are being missed.*

### 4. Immunization Coverage

One of the main priorities of the EPI has been to assist countries in establishing immunization programs that can deliver the primary immunization series to over 95% of the birth cohort, and hence reduce the health burden of vaccine preventable diseases. Countries initially focused on vaccination for six diseases, however in the past few years additional vaccines are being added to the same schedule. The vaccines presently being used in the countries are stated in Table 2.

Average coverage rates for all 19 countries were DPT 89%, OPV 89%, MMR 92%, and BCG 95%. Over 90% of infant vaccinations in the countries are given by the public health sector through their network of clinics. Vaccination figures from the private sector are routinely collected from private practitioners in most countries (Figure 3).

However, not all countries have been able to attain very high coverage, and some still show rates between 80-85%. Immunization coverage ranged from 80% to 100% for DPT, and

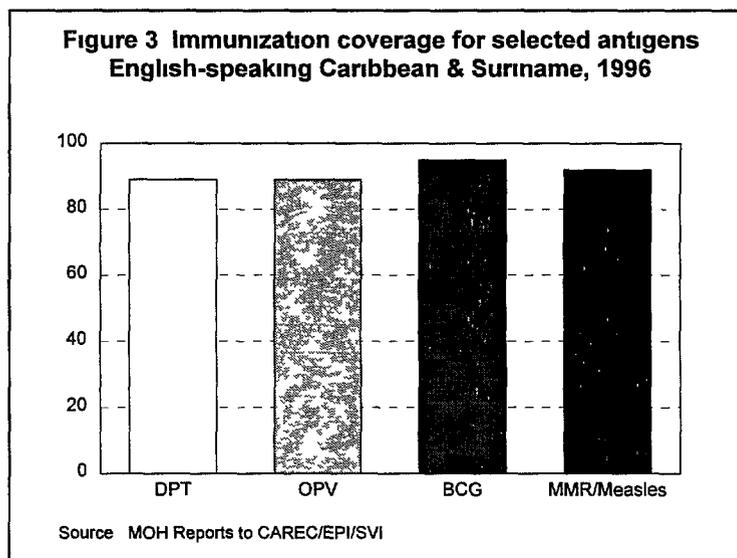
78% to 100% for MMR. Eight of the 19 countries accomplished coverage rates of 100% with DPT, TOPV, and nine for MMR vaccines. Although the less populated countries (populations less than 100,000) tend to achieve full birth cohort coverage, the larger ones have also been achieving increased coverage.

- *The review of coverage data for the countries for the period 1994-1996, indicates that special activities have to be implemented especially in Suriname, Grenada, Guyana, and Belize to increase coverage above 90%.*

**Table 2**  
**Vaccines Included in Immunization Schedules by Country - 1997**

Vaccine	Public Sector	Private Sector	Remarks
DPT/OPV/MMR	Yes	Yes	All countries
BCG	* Yes (in 9 countries)	Yes	*ANG/BLZ/CAY/DOM/GUY/JAM/MON STV/STL/TUR
HEP B	**Yes (in 5 countries)	Yes	**ANG/BER/SCN/STV/ CAY
Hib	+ Yes (in 2 countries)	#Yes (in 5 countries)	+ BER/CAY #BAH/BAR/CAY CAY/JAM/TRT
DPT + Hib	No	Yes (in 2 countries)	BAR/BAH

Sources: MOH Reports to CAREC



## 5. Introduction of New Vaccines

Many effective vaccines such as hepatitis B, *Haemophilus influenzae* type b, varicella, hepatitis A and acellular pertussis are available for introduction into the EPI schedule. Two vaccines currently being discussed for introduction in the English-speaking Caribbean—hepatitis B and *Haemophilus influenzae* type b (Hib).

These two vaccines are being administered by the private sector in many countries of the English-speaking Caribbean. In 1996, 42,208 20 mcg adult-dose vials of hepatitis B were bought by the private sector. Pediatric doses accounted for about 6,000, which could fully immunize only 1.4% of the birth cohort of the CMCs (Table 3).

Whereas four countries are using Hepatitis B vaccine in the public sector (1.7% of sub-region total birth cohort) only two are using Hib vaccine. The uptake in the private sectors is 28,128 doses of Hib vaccine which will only vaccinate 5-9% of the region's infants (Table 4). The birth cohort for 1996 was 140,311.

In spite of the progress achieved in high coverage rates in most countries, there are pockets of low coverage occurring in certain geographic areas, e.g., remote rural areas and dense urban areas.

**Table 3**  
**Hepatitis B Vaccine Procurement (No. of Doses) 1996**  
**English-speaking Caribbean**

Country	Ministry of Health	Private Sector	Total
Antigua	-	60	60
Barbados	271	1,129	1,400
Bahamas	-	3,204	3,204
Bermuda	-	1,335	1,335
Cayman Islands	-	801	801
Grenada	-	810	810
Jamaica	20,000	1,360	21,360
St Kitts & Nevis	3,000	-	3,000
St Lucia	-	75	75
St Vincent	-	1,200	1,200
Trinidad & Tobago	4,000	8,263	12,263
<b>TOTAL</b>	<b>27,271</b>	<b>18,207</b>	<b>45,508</b>

These high-risk areas will need special activities to increase coverage. Countries with borders such as Belize and Suriname face special problems in defining the target population of their border areas, and in reducing their attrition rates. Border meetings have been instituted in one of the countries and this is proving effective.

Sustainability of vaccine supply is still an issue for some countries. However, this should not deter discussions about the potential introduction of new vaccines. Various creative methods will have to be employed to finance immunization programs.

45

**Table 4**  
**Hib Vaccine Procurement (No. of doses) 1996**  
**English-speaking Caribbean (Private Sector)**

Country	Hib	DPT + Hib	Total
Aruba	216	-	216
Bermuda	2,255	-	2,255
Curacao	976	530	1,506
Trinidad & Tobago	6,548	-	6,548
Barbados	1,020	1,730	2,750
Jamaica	8,674	-	8,674
Bahamas	5,326	1,900	7,226
Cayman Islands	2,930	-	2,930
<b>TOTAL</b>	<b>27,945</b>	<b>4,160</b>	<b>32,105</b>

National program managers now face a wide array of new vaccines, either already available or shortly to be available. These vaccines include new multivalent combination products such as DTP-Hib, combinations which include hepatitis B vaccine, and DTP vaccines where the pertussis component is based on acellular pertussis vaccine. In a number of countries, hepatitis A vaccines are licensed, as is varicella vaccine. In the near future, there are likely to be safe and effective vaccines available to prevent meningococcal C infections in young children, as well as conjugate pneumococcal vaccines. In the longer term, it can be expected that vaccines against rotavirus infection, herpes viruses, respiratory syncytial virus, and even vaccines to prevent malignant and chronic diseases will become available.

- *The introduction of new vaccines into a national immunization program should not simply reflect their availability, but should follow a careful investigation of their appropriateness to that particular epidemiology and whenever possible, evidence that their introduction into routine use would be a cost-effective use of resources.*
- *Once that case has been made and resources identified, an introduction/implementation plan needs to be developed.*
- *Topics that will need to be considered include: vaccine studies, disease surveillance, supply arrangements, immunization scheduling, coverage measurements, communications strategies, professional training materials and surveillance for impact assessment.*
- *The implementation of new vaccines is a complex, multi-faceted task that requires the coordination of policy makers and program managers, public health experts, advertising and marketing experts, researchers, manufacturers, regulators, and parents and health professionals.*
- *The extensive experience in the Caribbean with implementation of immunization campaigns will be invaluable in the introduction of new vaccines into routine use, therefore, all countries in the region should strive to introduce these vaccines in the public sector within the next three years.*

## 6. Vaccine Logistics and Procurement

During 1997, over 90% of the countries were able to benefit from a steady supply of vaccines, syringes and needles. Countries should consider the purchase of new vaccines, e.g. hepatitis B and Hib through the PAHO/EPI Revolving Fund to take advantage of economies of scale, which may result in lower prices for these relatively expensive vaccines.

## 7. Booster Dose Policy

A panel discussion revealed a great variety of schedules for booster doses in children, adolescents and adults. These differences also exist with respect to immunization of health workers. Most countries give at least 3 booster doses between 1 year and end of school. Also, several booster doses are administered to pregnant females. In some countries, the schedule is further complicated by the fact that some private practitioners do not follow public-sector recommendations. Critical is the inconsistent use of Td instead of TT in adults from one country to the other. With a very marginal added cost, countries should consider using the Td vaccine to improve herd immunity against diphtheria. Of concern is also the refusal of some health workers to be immunized against hepatitis B despite a national policy of providing such vaccine in some countries. It was noted that booster doses may provide an additional opportunity to review primary immunization.

The discussion also highlighted that in many instances too many unnecessary booster doses were administered, particularly for TT. Booster schedules have experienced little review over the last few years.

- *It is extremely important that a thorough review of schedules and real need for boosters be conducted quickly in the Caribbean. The removal of unneeded boosters would result in savings that could be reallocated to the introduction of new antigens or strengthening of existing routine programs. Finally, when booster doses are needed, it is important to consider schedules that make it easier for parents to comply.*

## 8. Surveillance of Adverse Events

Most adverse events reported after vaccine administration are coincidental due to the large number of vaccine doses administered. The number of adverse events detected may be particularly high in the context of campaigns when large number of doses are administered over a short period of time. This does not necessarily indicate a rate of adverse events in excess of what would be expected.

The thorough surveillance of vaccine-associated adverse events conducted during the recent mass MMR campaign in the Bahamas has provided reassuring results about the safety of

the vaccine when used in older age groups. These results may help other countries gain better acceptance of similar campaigns aimed at the elimination of CRS.

Draft guidelines developed by PAHO for implementing a surveillance system for adverse events following immunizations were presented. The purpose of these guidelines is to help countries implement a reporting system for adverse events following immunization, and give general principles that even countries with currently existing monitoring programs might find useful to improve their system. It is hoped that prompt feedback from countries on the content of the document will help to finalize it within a year. International collaboration and exchange of information is extremely important. Proper training of health care providers and communication with the public and the media are important elements of a surveillance system.

- *It is extremely encouraging to see that many Caribbean countries have already developed such surveillance systems (some of which were presented at the Meeting) and that there is a general interest for their establishment. Many of the currently established systems, however, could benefit from improvements and fine tuning.*

#### **9. Safe Syringe Practices**

A panel of three countries presented procedures for safe syringe practices for single-use disposable syringes. The purpose of the panel was to remind countries to routinely review the safe use and disposal of syringes within their health services and to make sure that EPI syringes are not reused. The panel presentations confirmed that in all three countries, procedures are in place for the safe collection and disposal of single-use syringes. The moderator also confirmed that in these countries, health workers responsible for immunization do not recap needles before depositing them in a container, which is then collected and then taken for incineration or burial. The panel moderator emphasized that the PAHO/WHO recommendations for safe disposal of used syringes calls for incineration—burial is no longer acceptable. At the conclusion of the panel discussions, the moderator called on all countries to routinely review safe syringe practices with health services during 1998 to assure that safe procedures are in place and documented during supervisory visits.

#### **IV. CAREC Surveillance Priorities**

The countries of the English-speaking Caribbean have widely varying levels of development and per capita GDP, as well as small population sizes. Most depend on a few key people for surveillance. As a tourist attraction, the region has an intense and ever-increasing movement of people. In 1996, there were over 14 million stay-over arrivals and 7 million cruise ship arrivals, with implications for the introduction and transmission of diseases, including measles, polio and rubella.

In the face of this complex situation, CAREC has redefined its communicable disease priorities, which will continue to include measles, polio, rubella/CRS, diphtheria, pertussis, tetanus and tuberculosis. In addition, CAREC will work with the EPI to develop a surveillance system for other diseases that are becoming target of national immunization programs, such as *Haemophilus influenzae* type b and hepatitis B.

CAREC will also continue fostering partnerships with the private sector to strengthen their participation and use of disease data, including the establishment of a private physician sentinel surveillance system. Surveillance units will be established in hospitals to improve the detection of problems that result in hospitalization, (e.g. haemorrhagic fevers and meningitis) and a laboratory surveillance network is being established to monitor enteric organisms. Establishment of an Internet-based network to link countries to each other and to CAREC will be developed, while molecular epidemiology work started at the Center during 1997.

#### V. Financial Analysis of 1998 National Work Plans

All countries have presented and discussed their 1998 National Work Plans, outlining all the technical components and activities, including the cost per activity and area of action. The total cost for the EPI in the English-speaking Caribbean and Suriname for 1997 is on the order of US\$ 8,983,780, 92% of which will come from national budgets. The following is the distribution of these funds by source of funding, as requested by the national representatives. It may be noted that funds from the external agencies were not committed as of the meeting, this will require further negotiations at the country level.

<b>National funds</b>	US\$ 8,228,580
PAHO	US\$ 397,050
UNICEF	US\$ 175,950
OTHER	US\$ 182,200
<b>TOTAL</b>	<b>US\$ 8,983,780</b>

The funds from external agencies are being requested for the following areas of action:

Biological and Logistics	US\$ 2,009,150
Cold Chain	US\$ 357,540
Training	US\$ 279,000
Social Mobilization	US\$ 256,600
Operating Costs	US\$ 5,629,800
Supervision	US\$ 100,650
Surveillance	US\$ 170,640
Research	US\$ 107,900
Evaluation	US\$ 72,500
<b>TOTAL</b>	<b>US\$ 8,983,780</b>

Of note during 1997 was the strong bilateral support of the **Government of Japan**, which provided approximately US\$1 million dollars to nine countries, including MMR vaccine,

vehicles, cold chain equipment, autodestruct syringes and safety boxes. It is expected that this collaboration will continue during the coming years.

### ***Statement by UNICEF***

*UNICEF/CAO based in Barbados is commencing a new 5-year program cycle in 1998. As part of the program development process, situation analyses were prepared and this was followed by extensive consultations with governments and NGO counterparts to determine priority areas for action. Governments generally felt that they had made excellent progress in the area of health as evidenced by low IMR, high immunization rates, low levels of under nutrition and, with the exception of Suriname and to a lesser extent Trinidad and Tobago, it was generally felt that health issues were under control in relation to UNICEF support.*

*New priority areas identified for UNICEF assistance included adolescent concerns (physical and mental health, sexuality, education), pre-primary and basic education, establishment and monitoring of social indicators, child abuse prevention and management, violence in homes and parenting. In those communities where health indicators fell below the national average and there was an identified need for UNICEF support this would be continued.*

*This revised mandate and approach of necessity has implications for the continued UNICEF support in the traditional form.*

*The UNICEF offices in Guyana, Belize and Jamaica will continue to provide support to immunization programs based on the agreements reached with the governments in these countries.*

## **VI. Future Meeting Plans**

The next meeting will be held in November, 1998.

PAN AMERICAN HEALTH ORGANIZATION  
WORLD HEALTH ORGANIZATION

14TH CARIBBEAN EXPANDED PROGRAMME ON IMMUNIZATION  
(EPI) MANAGERS' MEETING  
NOVEMBER 18-20, 1997  
THE CARIBBEES HOTEL, CASTRIES, ST. LUCIA

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**Annex 5**  
***Evaluación del Programa Universal de Vacunación, México***

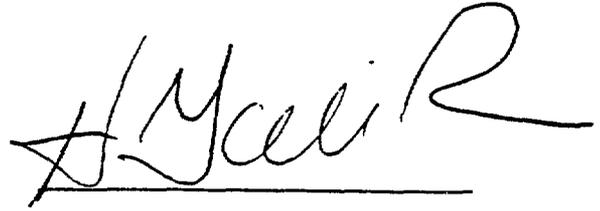
ESTADOS UNIDOS MEXICANOS  
SECRETARIA DE SALUD  
Y  
ORGANIZACION PANAMERICANA DE LA SALUD (OPS)

EVALUACION DEL PROGRAMA DE VACUNACION  
UNIVERSAL (PVU)

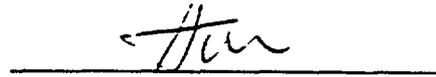
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6-16 de Octubre de 1997

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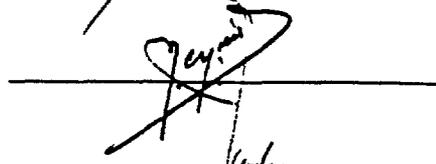
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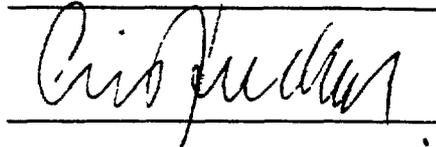
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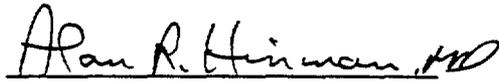
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Malaquías López Cervantes

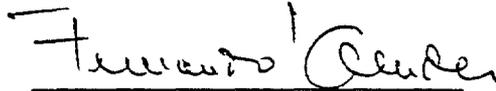


Ciro A de Quadros, Coordinador

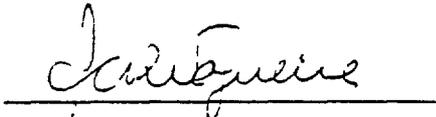


Alan Hinman

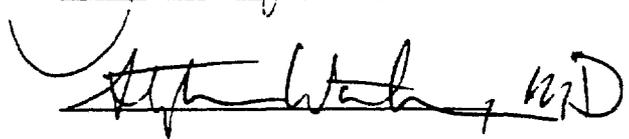
Fernando Laender



Cristina Noguera



Stephen Waterman



Nota Participaron además representantes de las principales instituciones del Sistema Nacional de Salud (SSA, IMSS e ISSSTE), tanto de nivel nacional como de los niveles estatales, jurisdiccionales y locales en las areas que fueron visitadas

## RESUMEN EJECUTIVO

En respuesta al compromiso contraído por México en la Cumbre Mundial en Favor de la Infancia, celebrada en la ciudad de Nueva York el 30 de septiembre de 1990, se creó el Programa de Vacunación Universal (PVU), el cual está orientado a fortalecer las acciones de prevención y control de las enfermedades inmunoprevenibles, dicho programa señala como meta prioritaria lograr la equidad en materia de vacunación de todos los menores de cinco años

Para coordinar y apoyar las acciones que en materia de inmunizaciones desarrollan las instituciones del Sistema Nacional de Salud, se creó el Consejo Nacional de Vacunación por Decreto Presidencial del 22 de enero de 1991, publicado en el Diario Oficial de la Federación el 24 de enero del mismo año. Desde su creación, el Consejo Nacional de Vacunación ha vigilado el desarrollo del Programa de Vacunación Universal e incorporado nuevas estrategias operativas. Según los datos disponibles se han logrado resultados muy alentadores, tanto en coberturas de vacunación como en impacto.

Estos datos indican que **en 1996, el 97% de los niños de uno a cuatro años de edad habían sido completamente vacunados, de acuerdo con el esquema básico vigente. Las tasas de morbilidad y mortalidad** debidas a los padecimientos que estas vacunas previenen, **son las más bajas jamás alcanzadas**, de manera especial, destaca la **ausencia de casos de poliomielitis durante los últimos siete años y de casos de difteria durante los últimos seis años**. El descenso en la morbilidad debida al sarampión es manifiesto, de manera tal que durante el último quinquenio solo se acumularon 12 casos confirmados, en 1996 únicamente se confirmaron dos casos y durante 1997 la Secretaría de Salud no ha reportado caso alguno de esta enfermedad.

Los principales hallazgos de la evaluación indican que la SSA, el IMSS y el ISSSTE han conferido **un alto grado de prioridad a las actividades de vacunación**, asignando los recursos necesarios y adoptando una visión estratégica para la incorporación de nuevas vacunas al esquema de vacunación, incluso aquellas que beneficiarán a la población adulta y/o previenen los defectos congénitos. Esto ha concientizado ampliamente al personal de las instituciones del Sistema Nacional de Salud y a la comunidad misma, con respecto a la importancia de la vacunación. El impacto de las estrategias utilizadas por el PVU, que incluyen la vacunación permanente y las jornadas intensivas de vacunación, indica que estas han sido adecuadas y que deben continuar y fortalecerse en el futuro.

También se alcanzaron ya niveles adecuados de coordinación entre las instituciones del Sistema Nacional de Salud, hacia el interior de ellas en todos sus niveles y se ha fortalecido la colaboración de otras organizaciones que laboran en el área de la salud, especialmente la OPS y el UNICEF.

En el informe de la evaluación se detallan los logros del PVU en sus diferentes áreas de acción y se identifican los principales cuellos de botella o debilidades que deben tomar en consideración las autoridades de salud

Las principales observaciones y recomendaciones incluyen

- La vigilancia epidemiológica y la capacidad de análisis rápido han alcanzado un alto nivel de calidad a nivel central, pero se identificó a nivel jurisdiccional y local que existen importantes aspectos que necesitan acción inmediata,
- La calidad de la información a nivel local es dudosa, llega al nivel central de manera inoportuna y no se retroalimenta a los niveles operativos,
- Falta capacitación actualizada en vigilancia epidemiológica a nivel del personal operativo y se desconocen las razones que fundamentan la vigilancia,
- Los puntos anteriores alertan sobre la posibilidad de que pudiera existir un subregistro de casos sospechosos de sarampión, considerando que durante 1997 se ha notificado un gran número de casos de rubéola y dengue sin confirmación de laboratorio y que existe un gran brote de sarampión en Sao Paulo, Brasil, el cual ya se extendió hacia otras áreas de América Latina
- Se debe agilizar la información de los resultados de laboratorio para que lleguen con prontitud al nivel local,
- Existe la necesidad de adecuar el PROVAC para su utilización a nivel local, favoreciendo la participación de ese nivel en la programación y evaluación de las actividades,
- Es importante revisar la regionalización actual, especialmente en el Distrito Federal, para que cumpla su función de optimizar recursos y evitar duplicidades,
- Es importante buscar los mecanismos que aseguren la introducción y disponibilidad de la vacuna Hib en todos los servicios de salud, unificando las acciones de vacunación en todos los niveles de las instituciones de salud,
- A medida de que se incluyan nuevas vacunas, será necesario empezar de inmediato las actividades de vigilancia de las enfermedades que pasen a ser objeto del programa,
- Se sugiere revisar el esquema actual de vacunación, en particular acerca de la necesidad del refuerzo con la vacuna DPT a los 18 meses de edad,
- Se debe incluir la vacunación contra la rubéola a todas las mujeres en edad fértil,
- Es importante que el sector privado participe en todas las actividades del programa, especialmente en las de vacunación y vigilancia epidemiológica

En las siguientes secciones del informe se presenta un listado detallado de todos los logros y problemas identificados en las distintas áreas de acción del programa y se hacen una serie de recomendaciones que podrían facilitar la solución de los problemas. Finalmente, se sugiere una línea general para la elaboración de un plan de acción de mediano plazo que puede facilitar la implementación de las recomendaciones

## 1. ANTECEDENTES

El Programa Ampliado de Inmunizaciones (PAI) es un componente fundamental dentro de las estrategias de atención primaria para la salud y en la entrega de servicios básicos de salud a la población. Su propósito es el de lograr el acceso universal a los servicios de inmunización a todos los niños y poblaciones a riesgo de contraer enfermedades prevenibles por vacunación. Entre sus metas específicas para el año 2000 se encuentra la erradicación global de la poliomielitis, el control del tétanos neonatal y la eliminación del sarampión en la Región de las Américas.

Actualmente la mayoría de los países utilizan por lo menos seis vacunas, para prevenir algunas enfermedades que son principales causas de morbilidad y mortalidad en los países en vías de desarrollo: poliomielitis, tosferina, sarampión, tétanos, difteria y tuberculosis. Mas recientemente, algunos países han introducido otras vacunas que previenen otras importantes causas de morbilidad y mortalidad como suelen ser la rubéola, la parotiditis y las infecciones invasoras por el *Hemóphilus influenzae*.

En el futuro cercano, otras importantes enfermedades también serán objeto de prevención a través de la vacunación. Entre estas se encuentran las diarreas producidas por el rotavirus, las neumonías producidas por el *Streptococco pneumoniae* y las meningitis producidas por el meningococco de tipo B. Esta promesa de un futuro en que varias enfermedades que hoy son importantes causas de morbilidad y mortalidad puedan ser prevenibles por vacunación hace hincapié que todos los países revisen sus políticas de salud pública para que se pueda, por un lado, mantener los logros alcanzados hasta la fecha con la vacunas en uso rutinario, y por otro asegurar la incorporación de las nuevas vacunas en los esquemas nacionales de vacunación. Esto se hace aun mas necesario en el momento en que todos los países aceleran los procesos de descentralización con la reforma del sector salud.

A medida que se ejecuta un programa nacional de inmunización, surgen problemas que van siendo superados. Uno de ellos es la falta de un sistema regular de evaluación, indispensable para los administradores nacionales para identificar los problemas que impiden la buena ejecución del programa. Por consiguiente, a fin de corregir esas deficiencias, la OPS estableció una metodología para la evaluación de los programas de inmunización. El propósito de la evaluación es ofrecer a los administradores nacionales un espectro de posibles soluciones e información destinada a mejorar el proceso de adopción de decisiones relativas al programa.

Dentro de estos principios, el Sr. Secretario de Salud de México, a través de comunicación fechada el 3 de Marzo de 1997, solicito al Sr. Director de la OPS que llevara a cabo una evaluación del PVU, que permitiera "valorar su desempeño, detectar insuficiencias y determinar la potencialidad de crecimiento en la producción de vacunas en uso y en la generación e incorporación de nuevas vacunas que actualmente ya tienen licencia."

## Componentes de la Evaluación

El proceso de esta evaluación tiene tres componentes

- 1 Evaluación de la Red de Frío y Logística del Programa, realizada el 15-19 de Septiembre de 1997 (Informe disponible en el CONAVA)
- 2 Estudio de viabilidad de producción de vacunas mediante la incorporación de tecnologías de punta a la Gerencia General de Biológicos y Reactivos, que posibilite su expansión y pueda cubrir las necesidades actuales y futuras que demandara el país Este estudio esta siendo desarrollado en este momento
- 3 Evaluación general de las áreas programaticas del PVU, la cual esta contenida en este Informe

Los objetivos principales de la evaluación del componente PVU fueron

- 1 Describir el desarrollo del Programa de Vacunación Universal (1990-1997),
- 2 Describir en forma cuantitativa los logros alcanzados y las actividades realizadas,
- 3 Identificar los problemas del Programa de Vacunación Universal,
- 4 Recomendar las acciones necesarias para solucionar los problemas,
- 5 Definir las actividades factibles y aplicables en relación con el proceso de descentralización para alcanzar en un tiempo determinado los objetivos trazados

Los resultados relativos a la evaluación de cada área programatica del PVU, indicando los logros, los problemas y las recomendaciones correspondientes a cada uno, fueron agrupados de la manera siguiente

- I Organización y coordinación (institucional, Interinstitucional, Extrasectorial)
- II Programación
- III Recursos humanos, físicos y financieros
- IV Capacitación
- V Supervisión
- VI Vigilancia epidemiológica
- VII Sistema de información
- VIII Comunicación social y participación de la comunidad

## **Metodología**

La metodología utilizada para la evaluación general del PVU incluye

- 1 Recolección y análisis de datos disponibles,
- 2 Visita en terreno,
- 3 Entrevistas personales y observación

Estas actividades se realizaron en los 3 niveles de la estructura del sistema de salud nacional, estatal y local y abarcaron visitas a las siguientes instituciones del sector SSA, IMSS e ISSSTE

Los instrumentos utilizados para la evaluación de las diferentes áreas constaron de encuestas y guías, con un tipo de cuestionario para cada nivel

- Guía de evaluación para nivel nacional,
- Guía de evaluación para nivel estatal y jurisdiccional,
- Guía de evaluación para nivel local

Se incluyeron una área geográfica (Distrito Federal) con cobertura menor al 90% y uno Estado (Yucatán) con cobertura superior al 95%, y en cada una de estas áreas se visitaron unidades de salud de diferentes niveles de complejidad y jerarquización

- De los estados con cobertura menor al 90%, por su importancia en el contexto nacional, se evaluó el Distrito Federal,
- Del grupo de mayores al 95%, Yucatán

Jurisdicción sanitaria y nivel local Una vez seleccionado el nivel estatal, se identificaron las jurisdicción sanitaria y las unidades de salud de distinta complejidad que fueron visitadas. Esta decisión se tomó en conjunto con los responsables del nivel estatal en terreno

Nivel nacional Se visitaron las áreas normativas de la SSA, IMSS e ISSSTE

IMSS Coordinación de Salud Comunitaria

ISSSTE Medicina Preventiva

Otros UNICEF, FUNSALUD, OPS

El informe final consolida los datos obtenidos en cada una de las noventa unidades de salud visitadas en las tres instituciones

## **Seguimiento del Plan de acción**

La SSA, el IMSS e ISSSTE serán los responsables del seguimiento de las actividades propuestas para alcanzar los objetivos definidos en la evaluación. Con tal fin es necesario

realizar reuniones conjuntas y continuas para medir cómo se están llevando a cabo las actividades. Periódicamente se debe elaborar un informe resumido de las acciones realizadas para el cumplimiento de las recomendaciones.

## **2. LOGROS, PROBLEMAS Y RECOMENDACIONES**

### **ORGANIZACIÓN Y COORDINACIÓN**

#### **Logros**

- Hay coordinación inter-institucional en el seno del CONAVA con alcances estatales y jurisdiccionales
- El programa utiliza diferentes estrategias y tácticas que han demostrado alto impacto epidemiológico
- La actual organización del programa cuenta con alta prioridad, en todas las instituciones y todos los niveles del sector salud
- Existe coordinación con agencias nacionales e internacionales (en especial OPS y UNICEF) para beneficio del programa
- Hay activa participación de las organizaciones civiles y de la comunidad
- Se cuenta con el señalamiento de áreas de responsabilidad de las instituciones  
Hay un equipo sólido y fuerte a nivel local que reconoce su área de responsabilidad

#### **Problemas**

- En algunas zonas la regionalización operativa supera a la capacidad de recursos humanos y de transportación disponibles en las unidades de salud para trabajarla. En algunos hospitales con trabajo extramuros son más evidentes estas deficiencias
- Poca participación del médico a nivel operativo en el equipo de trabajo de vacunación
- Es insuficiente la coordinación con el sector privado para la operación del programa.
- Las áreas de trabajo en vacunación permanente no siempre coinciden con las áreas de control
- No siempre se identifican las áreas de riesgo en forma coordinada
- Las áreas de trabajo de vacunación en algunas ocasiones no coinciden con las áreas de vigilancia epidemiológica
- Algunas instituciones de salud no ofrecen algunas vacunas que otros sí
- Los grados de comunicación entre instituciones y entre niveles no son ideales

#### **Recomendaciones**

- Revisar y actualizar la regionalización operativa, con la periodicidad necesaria y flexibilidad adecuada, a las circunstancias

- Incluir sistemáticamente al sector privado al programa
- Garantizar que se disponga de los recursos necesarios en cada nivel de operación para atender la responsabilidad delegada
- Incorporar en todas las instituciones que conforman el sistema nacional de salud todas las vacunas que contempla el nuevo programa de vacunación
- Mejorar los mecanismos de coordinación sectorial e intersectorial con énfasis en las áreas de riesgo
- Mejorar substancialmente los niveles de comunicación con respecto a la operación y alcances del programa en todos los niveles e instituciones participantes
- Fortalecer la participación coordinada de las distintas agencias nacionales e internacionales en favor del programa

## **PROGRAMACIÓN**

### **Logros**

- Los aciertos de las estrategias, la existencia de programas de trabajo en todos los niveles y la suficiencia de biológicos han permitido alcanzar altos niveles de vacunación en el país
- Existe un censo nominal de menores de cinco años, el cual facilita la programación de las actividades de inmunización
- Se cuenta con regionalización operativa del PVU lo que permite la participación coordinada de las instituciones públicas de salud al nivel local
- En la mayoría de las unidades de salud visitadas, se encontraron programas de trabajo con los objetivos y metas del PVU, así como croquis de sus áreas de responsabilidad (AGEBs)
- Se tienen metas de vacunación para el programa permanente y para las fases intensivas
- Existen manuales y normas de programación, sin embargo no todos los responsables de las actividades de vacunación los tienen o los conocen
- En las unidades de salud la vacunación se programa en forma conjunta con otras actividades

### **Problemas**

- Algunas instituciones no incorporan aun las nuevas vacunas al programa de vacunación (triple viral y DPT-Hib)
- La programación aún no se hace desde los niveles locales, lo que limita la participación del personal operativo, así como la evaluación del cumplimiento de metas ágil y oportuna en las unidades de salud
- Las acciones de actualización del censo nominal se dificultan por la escasez de recursos humanos, la lejanía de las áreas geográficas de responsabilidad, la falta de actualización de los croquis de las AGEBS, la migración y la inseguridad, particularmente en las áreas marginadas de las grandes ciudades

- En el D F es deficiente, la incorporación oportuna de los recién nacidos al censo nominal
- El PROVAC impone la necesidad de contar con equipos de cómputo con una capacidad cada vez mayor, los que difícilmente se tienen en los niveles estatales y jurisdiccionales
- Se detectaron variaciones en la metodología utilizada para la especificación de metas de vacunación, principalmente del programa permanente, mismas que se traducen en dificultades para especificar las coberturas reales. A veces se establece competencia por grupos poblacionales durante las acciones de tipo intensivo
- Los mecanismos de evaluación de avances son limitados por la falta de especificación de criterios operativos y la falta de participación del personal de las unidades de salud durante la elaboración de las metas
- En algunas unidades de salud, persisten debilidades para mantener la estrategia de vacunación permanente, por lo cual se depende en exceso de la vacunación domiciliaria durante fases intensivas
- Se desconoce el papel que juega la medicina privada en materia de vacunación y se carece de mecanismos para permitir la incorporación de ese subsector, lo cual puede ser de creciente importancia en las áreas urbanas más desarrolladas

### **Recomendaciones**

- Incorporación en todas las instituciones de salud del nuevo esquema de vacunación, que incluye a la vacuna triple viral y la cuádruple (DTP-Hib)
- Estandarizar la metodología para la programación de metas, revisando la utilidad y limitaciones del PROVAC en lugares como el D F
- Considerar implantar un sistema de encuestas de cobertura sistematizadas con periodicidad trimestral en lugares como el D F, como un mecanismo de información y evaluación de los logros en cobertura de vacunación
- Fortalecer los grupos de trabajo interinstitucional a todos los niveles
- Mantener actualizado el censo nominal, mejorando la incorporación oportuna de recién nacidos y la realización de actividades intensivas con enfoque de riesgo para cubrir las áreas geográficas prioritarias
- Mejorar la capacidad del equipo de cómputo para disminuir las limitaciones operacionales del PVU
- Explorar al nivel del CONAVA las posibilidades de incorporación paulatina de otras vacunas, en otros grupos poblacionales (p ej rubeóla en mujeres en edad fértil, polisacáridos de neumococo en ancianos, etc )

### **RECURSOS**

#### **Logros**

- Personal operativo identificado con el PVU con una gran mística de trabajo
- Suficiencia presupuestaria a nivel nacional para cubrir los actuales esquemas de vacunación, lo que refleja la alta prioridad política dada al PVU

- Suficiencia de biológicos e insumos de acuerdo a metas en todas las unidades
- Permanente búsqueda de otras fuentes de financiamiento para las actividades de vacunación intensiva
- La coordinación interinstitucional cumple con el papel de suplir las carencias

### **Problemas**

- Insuficiencia presupuestaria para la incorporación de nuevas vacunas
- Insuficiencia de personal para actividades de campo, sobre todo de enfermería, en las unidades de primer nivel
- Dificultad para utilizar ingresos por recuperación en algunas áreas de la SSA
- Inoportunidad o carencia de transporte y de recursos para el pago de pasajes y viáticos
- Diferencias en el pago por la misma jornada de trabajo de los vacunadores entre las instituciones de salud
- Inadecuada red de computación por obsolescencia de los equipos, que retrasan el desarrollo del programa

### **Recomendaciones**

- Supervisar y verificar que los recursos sean suficientes y lleguen con oportunidad hasta las unidades más pequeñas
- Completar plantillas de acuerdo a indicadores, con énfasis en el área de enfermería para actividades de campo
- Gestionar el uso de cuotas de recuperación para las unidades, etiquetándolo hacia los conceptos de gastos autorizados
- Apoyo de transporte para las actividades extramuros
- Homologar los pagos de pasajes y viáticos entre las instituciones de salud
- Dotación de adecuado equipo de cómputo e incluir en futuro presupuestos de inversión a las unidades, dentro del programa de modernización administrativa

## **CAPACITACION**

### **Logros**

- En general, el personal de todos los niveles está bien capacitado en normas y procedimientos de vacunación
- Existen normas y manuales de vacunación disponibles en todos los niveles e instituciones visitadas
- La mayoría de las visitas de supervisión son consideradas como oportunidades de capacitación en las unidades de salud
- Los cursos de capacitación son evaluados con pre- y post-tests

## **Problemas**

- Falta, insuficiencia o demora de la capacitación en vigilancia epidemiológica (VE) En algunas áreas la capacitación en VE no se programó para las actividades de 1997
- En muchas áreas sólo se realizan actividades de capacitación como apoyo a las fases intensivas y no siempre se incluyen en el programa permanente
- Algunos trabajadores de salud del nivel local no usan el contenido de los manuales
- Deficiente evaluación y capacitación en oportunidades perdidas de vacunación
- La capacitación en VE está restringida generalmente a los médicos y no se involucra a las enfermeras
- No todas las supervisiones son capacitantes

## **Recomendaciones**

- Hacer capacitación en VE y otros componentes del programa de manera oportuna y conjunta para todo el personal médico, de enfermería, y del laboratorio en todos los niveles
- Enfatizar la VE de las Enfermedades Febriles Exantemática (EFEs), dado que se tiene como meta la eliminación del sarampión
- Capacitar al personal del nivel local en el uso de la información para la acción (especialmente la información de VE)
- Evaluar si los cursos de capacitación cambian el comportamiento, y no sólo el conocimiento de los trabajadores de la salud
- Desarrollar un manual único de aplicación de vacunas avalado por las tres instituciones SSA, IMSS, e ISSSTE que incluya a las nuevas vacunas
- Capacitar al personal de todos los niveles sobre las nuevas vacunas (triple viral, y DTP-Hib)
- Incluir en la currícula de las facultades y escuelas de medicina, enfermería, y salud pública, aspectos de inmunizaciones, incluyendo VE, nuevo esquema de vacunación y funcionamiento de los servicios de vacunación
- Realizar evaluaciones de oportunidades perdidas de vacunación, para capacitar al personal de salud en estrategias de abatimiento en las unidades médicas del sector salud

## **SUPERVISIÓN**

### **Logros**

- En los niveles estatales y jurisdiccionales, se tienen actividades rutinarias y formales de supervisión
- Se cuenta con cronograma de visitas a las jurisdicciones y unidades de salud
- Se cuenta con guías de supervisión
- Se deja informe escrito y se hace seguimiento de las recomendaciones
- El personal supervisor está capacitado para realizar esta función

### **Problemas**

- Insuficiente supervisión de vigilancia epidemiológica
- El programa permanente recibe menos supervisión que las jornadas intensivas
- No se supervisan las actividades de las parteras tradicionales en las áreas de riesgo para tétanos neonatal
- Falta claridad a las guías de supervisión en algunos de los aspectos supervisados
- En algunas unidades del Distrito Federal no se encontraron evidencias del seguimiento de las recomendaciones de supervisiones previas
- Es poco común la supervisión interinstitucional

### **Recomendaciones**

- Supervisar las actividades de vigilancia epidemiológica en las unidades de salud, y revisar los diagnósticos emitidos en la consulta en el mes previo a la visita de supervisión, para evaluar si algún padecimiento podría haber entrado a sistema de vigilancia epidemiológica
- Incrementar las visitas de supervisión del programa permanente
- Revisar expedientes de mujeres embarazadas y visitar a las parteras tradicionales para verificar las acciones de prevención y vigilancia del Tétanos Neonatal que la unidad de salud debe realizar
- Reelaborar las guías de supervisión, acompañándolas de un instructivo de llenado
- Hacer seguimiento de las recomendaciones de la supervisión anotando en la libreta de las unidades de salud el avance del cumplimiento de las mismas
- Hacer supervisiones interinstitucionales tanto del programa permanente como de las jornadas intensivas, por lo menos una vez al año

## **VIGILANCIA EPIDEMIOLOGICA**

### **Logros**

- Existe capacidad técnica y recursos suficientes en el nivel nacional para la vigilancia
- Existen técnicos responsables en los niveles nacional, estatal y jurisdiccional del sector
- Existen normas y manuales de vigilancia epidemiológica disponibles en la mayoría de las unidades visitadas
- Existen fichas de investigación de casos en los niveles estatales y jurisdiccionales
- Existe una red de Notificación semanal a nivel nacional que comprende a varias instituciones del sector
- Se realizan análisis trimestral de datos epidemiológicos en detalle a nivel nacional y estatal Se cuentan con series históricas de casos y defunciones
- Se publican boletines epidemiológicos en forma diaria y semanal
- El Laboratorio Nacional de Referencia (INDRE) cuenta con recursos y capacidad técnica de diagnóstico para las enfermedades inmunoprevenibles

- Existe un algoritmo formal y normas para envío y análisis de muestras de casos de EFEs al INDRE
- Esta en proceso de implementación la vigilancia de algunas enfermedades de introducción reciente de vacunas (Rubéola, SRC y Hib)
- Se esta implementando la vigilancia hospitalaria de eventos adversos post vacunales en el RHOVE

### **Problemas**

- Insuficiente recursos a nivel operativo
- Algunas unidades de salud no tienen personal encargado de la vigilancia
- Insuficiente participación del personal de enfermería en la vigilancia epidemiológica (VE)
- Algunas unidades operativas no cuentan con normas y manuales de vigilancia o no estan actualizados
- Fichas de investigación de casos incompletas o inexistentes a nivel local
- No participación de fuentes alternativas de Notificación (sector privado, escuelas, promotores, comunidad) en todos los niveles
- No en todas las unidades operativas, se realiza la Notificación negativa (escribir específicamente "0" o "no hubo casos" en los reportes semanales)
- Falta de información sobre casos importados de sarampión u otras enfermedades previsibles por vacunación en todos los niveles y servicios médicos para turistas
- Poco o inexistente análisis de la información a nivel local Este se centraliza a nivel jurisdiccional y estatal
- Alto subregistro de EFEs y Tos ferina
- Retroalimentación de la información inadecuada para los niveles operativos
- Recursos insuficientes o subutilización del laboratorio a nivel estatal
- Solamente 22 estados cuentan con capacidad diagnóstica para las EFEs El INDRE actúa como laboratorio estatal del D F
- La mayoría de los casos registrados de enfermedades inmunoprevenibles a nivel local se basan en diagnósticos clínicos
- Poca comunicación entre los diferentes niveles e instituciones sobre los resultados de laboratorio
- Aplicación inadecuada de las normas de laboratorio en todos los niveles
- No se tienen identificados en el país el número de laboratorios que conservan poliovirus activos
- No esta programado hacer un sistema de vigilancia para parotiditis
- Deficiencia en la vigilancia sistemática de eventos adversos post vacunales en el primer nivel

### **Recomendaciones**

- Asegurar la asignación de recursos a nivel operativo para las acciones de vigilancia

- Involucrar al personal de enfermería en todas las actividades de vigilancia en los diferentes niveles
- Habilitar al personal de las unidades operativas para ejecutar actividades de VE
- Capacitar de forma oportuna a los pasantes de enfermería y medicina y actualizar al personal de base de los niveles operativo y jurisdiccional
- Fortalecer el uso adecuado de las fichas de investigación y el seguimiento de casos a nivel local
- Incluir lo más pronto posible al D F en la supervisión integral que está siendo llevada a cabo a nivel nacional
- Identificar e incluir la participación de otras fuentes de Notificación en todos los niveles
- Promover la participación de los promotores de salud en la Notificación activa de enfermedades prevenibles por vacunación
- Estimular la Notificación negativa en el nivel operativo
- Desarrollar un sistema de vigilancia activa para la detección oportuna de casos importados de Efes (hoteles, agencias de viajes, aeropuertos, médicos privados, etc )
- Asegurar que se tomen muestras de orina de casos sospechosos de sarampión para posible aislamiento viral
- Reforzar la capacidad analítica de los niveles operativos
- Implantar actividades de búsqueda activa y fortalecer la vigilancia de EFes y tos ferina en todo el país
- Asegurar la retroalimentación en los niveles operativos
- Ampliar y/o incluir la vigilancia y diagnóstico de laboratorio para las otras enfermedades en que se introducen las nuevas vacunas
- Completar la red de laboratorios estatales de salud pública
- Asegurar que las otras instituciones del sector salud, sean autosuficientes para realizar pruebas de tamizaje
- Comunicación oportuna de los resultados de laboratorio a todos los niveles y cuidar que llegue esta información a los niveles operativos
- Garantizar la aplicación de las normas de laboratorio en el envío de muestras
- Concentrar los poliovirus existentes en otros laboratorios del país en el INDRE, e instrumentar un sistema de seguridad, hasta la erradicación global de la poliomielitis
- Ampliar e incluir la vigilancia y diagnóstico de laboratorio para las otras enfermedades de reciente y próxima introducción en el programa de vacunación
- Ampliar y fortalecer la vigilancia de eventos adversos en toda la estructura del sector

## **SISTEMA DE INFORMACIÓN**

### **Logros**

- Hay un responsable del sistema de información en todos los niveles del sector salud
- En los niveles estatales, jurisdiccionales y grandes unidades de salud se cuenta con el Manual de Información PROVAC
- En todos los niveles del sector salud se cuenta con información demográfica por grupo de edad, área de influencia y sexo

- La cartilla de vacunación es ampliamente utilizada en todas las unidades del sector salud
- En la mayoría de las unidades de salud se encontró el censo nominal y el listado de esquemas incompletos del PROVAC
- Existe un informe mensual de los avances del PVU en todos los niveles y trimestralmente se envía una evaluación al nivel nacional
- El PROVAC es un sistema valioso que permite hacer seguimiento de los niños y conocer la cobertura de vacunación
- Existe coordinación entre enfermería y el sistema de información y buen conocimiento de las coberturas por AGEB, por ejemplo en algunas unidades los capturistas participan en el trabajo de campo
- Se han hecho encuestas rápidas que muestran coberturas iguales o superiores a las registradas por el PROVAC

### **Problemas**

- En algunas áreas los listados llegan en forma inoportuna al nivel local
- No hay concordancia entre el censo mecanizado y la capitación de niños en el censo nominal en el nivel local de algunas áreas
- Muchas de las unidades tienen equipo de cómputo con capacidad insuficiente para operar el software del PROVAC y falta personal para mantener actualizados los datos
- No todos los nacimientos son captados por el sistema de información
- No hay conocimiento del procedimiento a utilizar para seguir a un niño que ha migrado en el PROVAC
- Hay falta de evaluación de calidad de información
- Alto subregistro observado en el censo nominal en el D F
- El intercambio de información entre las instituciones a nivel local, a veces es tardío o no se presenta
- La regionalización en el D F es muy compleja, el área de influencia no coincide con el área de responsabilidad del programa en las unidades de salud
- No se realiza análisis de datos en el nivel local
- En algunas unidades no se tiene desagregado al grupo de menores de un año del de 0 a 4 años en la pirámide poblacional
- Dificultad para instalar y operar la última versión del PROVAC

### **Recomendaciones**

- Revisar y actualizar la regionalización en las instituciones del sector con la participación del nivel operativo para mejorar la eficacia y asegurar la cobertura territorial del programa
- Hacer análisis de la información, para optimizar el trabajo de vacunación casa a casa en áreas de riesgo con bajas coberturas, con la finalidad de que las acciones tengan más impacto
- Mayor asignación de recursos incluyendo la participación del personal de nivel operativo para operar el PROVAC

- Mejorar la capacitación a nivel operativo
- Desarrollar un sistema de evaluación de calidad de información
- Implementar un mecanismo de registro de nacimientos mas oportuno
- Mejorar el intercambio de información, estableciendo un sistema de calidad continua
- Solicitar la cartilla nacional de vacunación en los trámites oficiales (escuelas, guarderías, consulta médica y otros servicios)
- Mejorar el sistema de registro de mujeres en edad fértil y embarazadas
- Realizar encuestas rápidas de cobertura en forma sistemática y con periodicidad trimestral en áreas donde el PROVAC presenta insuficiencias, como es el caso del D F
- Capacitar al personal operativo en la correcta elaboración de la pirámide poblacional de su área de influencia

## **COMUNICACIÓN SOCIAL Y PARTICIPACIÓN DE LA COMUNIDAD**

### **Logros:**

- Todo el personal de salud entrevistado conocía la utilidad y el impacto de los materiales de promoción producidos a nivel nacional
- Existe alta prioridad y recursos para la promoción del programa, lo que permite que el CONAVA cuente con un área de Comunicación Social que le da uniformidad a los mensajes emitidos por el sector salud
- Existe coordinación del personal de sector salud con autoridades y líderes naturales de la comunidad
- Se transmiten mensajes promocionales en español y otras lenguas que se hablan en el país
- Se elaboran materiales educativos a nivel local, además de los enviados por los niveles nacional y estatal
- Existe gran aceptación del Programa de Vacunación Universal en la comunidad
- Se utilizan diferentes medios de comunicación social para la divulgación y promoción del PVU, como radio, TV y prensa escrita, entre otros
- Existe Participación Social en todo el país como apoyo al PVU, principalmente en las Semanas Nacionales de Salud

### **Problemas**

- No se hacen acciones permanentes de promoción específicas para problemas particulares y geográficamente localizados (EFEs, TNN, poblaciones renuentes, etc ) en la mayoría de las unidades visitadas
- Insuficiente participación de parteras en los aspectos de promoción del PVU
- Insuficiente coordinación con el sector de salud privado en las actividades del PVU
- Insuficiente comunicación con grupos político-partidarios y/o religiosos que en ocasiones impiden la entrada al personal de salud en estas áreas, dificultando el trabajo de promoción y educación del PVU
- Insuficientes actividades de promoción para el Programa Permanente

- En algunos lugares el material promocional llega muy tardíamente al nivel local de salud
- El costo de producción de los materiales de promoción nacional del CONAVA no están compartidos entre todas las instituciones de salud

### **Recomendaciones**

- Identificar áreas de riesgo para realizar actividades específicas de promoción y de educación para la salud, por ejemplo bajas coberturas, presencia de casos de enfermedades inmunoprevenibles, municipios repetidores de TNN, parteras repetidoras de TNN, y grupos étnicos o religiosos, relacionados con renuencia al programa
- Capacitar a las parteras tradicionales en su propia lengua
- Crear estrategias y mecanismos para integrar al sector de salud privado en las actividades del PVU, en todos los niveles
- Intensificar la promoción del programa permanente de vacunación para incrementar la demanda espontánea a los servicios de salud.
- Asegurar que el material de promoción del PVU llegue oportunamente a todos los niveles
- Compartir el costo de producción del material de promoción del programa entre todas las instituciones del sector salud
- Actualizar los libros de texto gratuito y capacitar a los maestros en el nuevo esquema de vacunación
- Mejorar la coordinación interna para vincular la promoción del PVU con las otras áreas de la SSA que desarrollan actividades de Promoción de la Salud

### **3. LINEAMIENTOS PARA EL PLAN DE ACCION**

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AREA DE ACCION: PROGRAMACION

ACTIVIDADES	CRONOGRAMA										RESPONSABLE	OBSERVACIONES
	97	1998				1999						
	4	1	2	3	4	1	2	3	4			
- Destinar los recursos para implementar de inmediato en todo el país el esquema actualizado de vacunación		X				X					IMSS/SSA/ISSSTE	
- Realizar talleres de programación con énfasis en las nuevas vacunas y con la participación de todo el nivel operativo, organizado por los COEVAS		X									NIVEL ESTATAL, JURISDICCIONAL IMSS/SSA/ISSSTE	
- Los COEVAS deben convocar a una reunión con hospitales y Registro Civil para facilitar la incorporación oportuna en el censo nominal de los recién nacidos		X				X					COEVAS, NIVEL ESTATAL, JURISDICCIONAL IMSS/SSA/ISSSTE	Por ejemplo instalar PROVAC en algunos hospitales.
- Realizar un taller para desarrollar un censo sobre los criterios de riesgo para identificar las áreas geográficas prioritarias.		X									CONAVA	Necesidad de incluir IMSS/SSA/ISSSTE en todos sus niveles.
- Realizar talleres jurisdiccionales para fortalecer el programa permanente de vacunación en el nivel operativo		X		X		X		X			COEVAS, IMSS,ISSSTE,SSA, JURISDICCIONES SANITARIAS.	

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**AREA DE ACCION: PROGRAMACION**

ACTIVIDADES	CRONOGRAMA								RESPONSABLE	OBSERVACIONES	
	97	1998				1999					
		4	1	2	3	4	1	2			3
<ul style="list-style-type: none"> <li>- Adquirir el equipo necesario para disminuir las limitaciones operacionales del sistema de computo en todos los niveles.</li> <li>- Solicitar al Comité Técnico Asesor revise la política de control del SRC. y se difunda a todos los niveles e instituciones del sector</li> </ul>		X								IMSS, ISSSTE, SSA, ESTATAL, CONAVA	
	X									COORDINACION DE VIGILANCIA EPIDEMIOLOGICA Y CONAVA	

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**AREA DE ACCION: RECURSOS**

ACTIVIDADES	CRONOGRAMA									RESPONSABLE	
	97	1998				1999					
	4	1	2	3	4	1	2	3	4		
Asegurar financiamiento para la adquisición y aplicación de nuevas vacunas SRP y DPTHib				X							SSA y CONAVA
Supervisar y verificar que los recursos sean suficientes y oportunos en todos los niveles	X	X	X	X	X	X	X	X	X		SSA, IMSS e ISSSTE
Completar plantillas de personal de acuerdo a modelos de atención		X									SSA, IMSS, ISSSTE, en todos los niveles
Gestionar la autorización del uso de cuotas de recuperación para las unidades de primer nivel	X	X	X	X	X	X	X	X	X		SSA
Proveer recursos para transporte, viáticos y pasajes del personal vacunador, homologando estos pagos entre las instituciones del Sector		X	X	X	X	X	X	X			SSA, IMSS, ISSSTE, en todos los niveles
Dotar equipos de cómputo adecuado al Programa de Vacunación Universal en todos los niveles		X									SSA, IMSS, ISSSTE

Cont

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**AREA DE ACCION: CAPACITACION**

ACTIVIDADES	CRONOGRAMA									RESPONSABLE	OBSERVACIONES	
	97	1998				1999						
	4	1	2	3	4	1	2	3	4			
- Solicitar a la Comisión Nacional para la Formación de Recursos Humanos en Salud, incluya en la currícula aspectos de vacunación y vigilancia epidemiológica		X									CONAVA, COEVAS	Hacer extensivo a las comisiones estatales.
- Llevar a cabo cursos de capacitación en VE para todo el personal médico y de enfermería con énfasis en EFEs y nuevas vacunas	X	X	X	X	X	X	X	X	X		SSA, IMSS, ISSSTE A TODOS LOS NIVELES, C.V.E. y	
- Destinar recursos para desarrollar instrumentos de evaluación de los cursos de capacitación	X	X									SSA, IMSS, ISSSTE A NIVEL NACIONAL Y ESTATAL	
- Realizar reunión para llegar a concenso y realizar un manual único de procedimientos y normas en la aplicación de vacunas incorporando las nuevas	X										CONAVA, SSA, IMSS, ISSSTE	

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AREA DE ACCION: SUPERVISION	ACTIVIDADES	CRONOGRAMA												RESPONSABLE	OBSERVACIONES
		1998						1999							
		97	1	2	3	4	1	2	3	4					
	Supervisar las actividades de vacunación con énfasis en Vigilancia Epidemiológica, en las Unidades de salud.	X	X	X	X	X	X	X	X	X	X	X	X	SSA, ISSSTE	IMSS,
	Evaluar la calidad de los diagnósticos de Enfermedades Inmunoprevenibles, emitidos en los servicios de salud		X	X	X	X	X	X	X	X	X	X	X	SSA, ISSSTE	IMSS,
	Realizar e incrementar las visitas de supervisión al Programa Permanente de Vacunación	X	X	X	X	X	X	X	X	X	X	X	X	SSA, ISSSTE	IMSS,
	Revisar expedientes de mujeres embarazadas y visitar a las parteras, para vigilancia de TNN en áreas de riesgo	X	X	X	X	X	X	X	X	X	X	X	X	SSA, ISSSTE	IMSS,
	Actualizar las guías de supervisión acompañados de instructivos.		X											SSA, ISSSTE	IMSS,
	Garantizar el cumplimiento de las recomendaciones emitidos durante la supervisión	X	X	X	X	X	X	X	X	X	X	X	X	SSA, ISSSTE	IMSS,
	Realizar supervisiones interinstitucionales al Programa Permanente y Semanas Nacionales de Salud	X			X							X		SSA, ISSSTE	IMSS,

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AREA DE ACCION: VIGILANCIA EPIDEMIOLOGICA

ACTIVIDADES	CRONOGRAMA										RESPONSABLE	OBSERVACIONES
	97	1998				1999						
	4	1	2	3	4	1	2	3	4			
- Ampliar el sistema de notificación semanal a todas las unidades del Sistema de Salud	X	X	X	X	X	X	X	X	X	X	IMSS/SSA/ISSSTE NIVELES NACIONAL, ESTATAL, JURISDICCIONAL	Lograr el 100% de las 15,000 unidades identificadas.
- Incluir la participación de los promotores de salud en la notificación de las enfermedades prevenibles por vacunación.	X	X	X	X	X	X	X	X	X	X	IMSS/SSA/ISSSTE NIVELES NACIONAL, ESTATAL, JURISDICCIONAL Y LOCAL	Evaluar la experiencia y resultados del sistema de vigilancia epidemiológica simplificada.
- Completar la red nacional de laboratorios estatales asegurando el cumplimiento inmediato del algoritmo de diagnóstico de sarampión, rubéola y dengue	X	X	X								COORDINACION DE VIGILANCIA EPIDEMIOLOGICA, INDRE, D.G.A.E. Y AREAS RESPONSABLES DEL IMSS E ISSSTE	Asegurar que las otras instituciones del sector salud sean autosuficientes en las pruebas de tamizaje para el diagnóstico de las EFES
- Enviar oportunamente los resultados del laboratorio a los niveles correspondientes	X	X	X	X	X	X	X	X	X	X	IMSS/SSA/ISSSTE NIVELES NACIONAL, ESTATAL, JURISDICCIONAL Y LOCAL, INDRE, D.G.A.E., LABORATORIOS	

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**AREA DE ACCION: VIGILANCIA EPIDEMIOLOGICA**

ACTIVIDADES	CRONOGRAMA									RESPONSABLE	OBSERVACIONES
	97	1998				1999					
	4	1	2	3	4	1	2	3	4		
-Asignar más recursos a nivel operativo para garantizar las acciones de VE, vinculadas al programa de trabajo	X	X	X	X	X	X	X	X	X	IMSS/SSA/ISSSTE NIVELES NACIONAL Y ESTATAL	Los recursos estarán de acuerdo a las necesidades de cada institución.
- Fomentar la participación del personal de enfermería en todas las actividades de vigilancia mediante talleres u otras actividades de capacitación	X	X	X	X	X	X	X	X	X	IMSS/SSA/ISSSTE NIVELES NACIONAL, ESTATAL, JURISDICCIONAL Y LOCAL	No requiere presupuesto propio. Iniciallo de inmediato y por etapas trimestrales (3), evaluarlo y darle seguimiento.
- Verificar la utilización adecuada de los formatos de investigación y seguimiento de los casos de las enfermedades inmunoprevenibles a nivel local	X	X	X	X	X					IMSS/SSA/ISSSTE NIVELES NACIONAL, ESTATAL, JURISDICCIONAL Y LOCAL	
-Incluir y monitorear la participación de otras fuentes de notificación en todos los niveles	X	X	X	X	X	X	X	X	X	IMSS/SSA/ISSSTE NIVELES NACIONAL, ESTATAL, JURISDICCIONAL	- Otras fuentes: Medicina privada, escuelas, promotores y comunidades

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AREA DE ACCION: VIGILANCIA EPIDEMIOLOGICA

ACTIVIDADES	CRONOGRAMA										RESPONSABLE	OBSERVACIONES
	97	1998				1999						
	4	1	2	3	4	1	2	3	4			
- Incluir en las capacitaciones del programa la vigilancia de rubéola, SRC, parotiditis, Hib, y eventos adversos post vacunales.	X	X	X	X	X	X	X	X	X	X	CONAVE, D.G.A.E., CONAVA INDRE Y LABORATORIO NACIONAL DE SALUD PUBLICA	
- Implantar las pruebas necesarias para el diagnóstico laboratorial de las enfermedades prevenibles por vacunación de reciente introducción	X	X	X	X	X						INDRE Y LABORATORIOS ESTATALES DE SALUD PUBLICA.	
- Establecer sitios centinela de vigilancia activa de casos importados en los lugares turísticos y médicos privados	X	X	X	X	X	X	X	X	X	X	D.G.A.E., CONAVA, IMSS/SSA/ISSSTE NIVELES NACIONAL, ESTATAL, JURISDICCIONAL Y LOCAL	
- Distribuir oportunamente los boletines epidemiológicos hasta el nivel operativo	X	X	X	X	X	X	X	X	X	X	IMSS/SSA/ISSSTE NIVELES NACIONAL, ESTATAL, JURISDICCIONAL Y LOCAL	Es una acción indispensable para la actualización y el fortalecimiento de los niveles locales.

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AREA DE ACCION: VIGILANCIA EPIDEMIOLOGICA

ACTIVIDADES	CRONOGRAMA										RESPONSABLE	OBSERVACIONES	
	97	1998				1999							
	4	1	2	3	4	1	2	3	4				
- Realizar cursos de capacitación para el personal de nivel local en el registro adecuado y toma de muestras de casos de EFes y Tosferina, para abatir el subregistro	X		X		X							IMSS/SSA/ISSSTE NIVELES NACIONAL, ESTATAL, JURISDICCIONAL	
- Elaborar en el nivel operativo informes trimestrales de las actividades del P.V.U. que incluyan análisis de la información epidemiológica	X	X	X	X	X	X	X	X	X	X		SSA, IMSS, ISSSTE A NIVEL LOCAL.	
- Hacer un taller nacional para evaluar los avances en la eliminación del sarampión y dar seguimiento a los compromisos derivados de la evaluación realizada por la OPS en 1995.		X										CONAVA, D.G.A.E., SSA, IMSS E ISSSTE NIVEL NACIONAL Y	

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**AREA DE ACCION: SISTEMA DE INFORMACION**

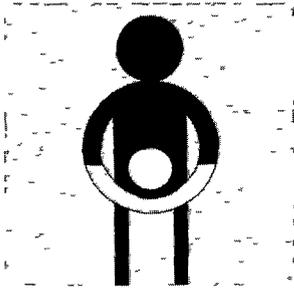
ACTIVIDADES	CRONOGRAMA										RESPONSABLE	OBSERVACIONES
	97	1998				1999						
	4	1	2	3	4	1	2	3	4			
Realizar cursos de capacitación para los capturistas, epidemiólogos, y enfermeras a nivel operativo en el nuevo sistema de información	X	X									SSA, IMSS, ISSSTE, en todos los niveles	
Desarrollar e implantar un sistema de evaluación de calidad de la información	X	X	X								SSA, IMSS, ISSSTE, DGEI y CONAVA	
Desarrollar un sistema de registro de mujeres de edad fértil e implantarlo	X	X	X	X							SSA, IMSS, ISSSTE, DGEI, CONAVA y DGSR	
Identificar áreas que requieren encuestas rápidas de cobertura y realizarlas, priorizar el D F.	X	X	X	X	X	X	X	X	X		SSA, IMSS, ISSSTE, en todos los niveles	

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**AREA DE ACCION: COMUNICACION SOCIAL Y PARTICIPACION DE LA COMUNIDAD**

ACTIVIDADES	CRONOGRAMA										RESPONSABLE	OBSERVACIONES
	97	1998				1999						
	4	1	2	3	4	1	2	3	4			
Identificar áreas de riesgo para actividades específicas de promoción	X	X	X	X	X	X	X	X	X	X	SSA, IMSS, ISSSTE	
Distribuir material de promoción al sector privado		X	X	X	X	X	X	X	X	X	Estatal y Jurisdiccional	
Intensificar la promoción del Programa Permanente a través de los medios de comunicación	X	X	X	X	X	X	X	X	X	X	SSA, IMSS, ISSSTE	
Asegurar la oportunidad en la recepción de los materiales de promoción hasta el primer nivel	X	X	X	X	X	X	X	X	X	X	Estatal y Jurisdiccional	
Incorporar en los libros de texto gratuito el nuevo esquema de vacunación				X							SEP y SSA	
Realizar reuniones para vincular la promoción del P.V.U con otros programas de promoción	X	X	X	X	X	X	X	X	X	X	CONAVA, SSA, IMSS e ISSSTE	
Producir e imprimir materiales de producción en todas las instituciones del Sector			X								SSA, IMSS e ISSSTE	

**Annex 6**  
*EPI Newsletter, Volume XIX, Nos. 5 and 6, Volume XX, No. 1*



# EPI Newsletter

## Expanded Program on Immunization in the Americas

Volume XIX, Number 5

IMMUNIZE AND PROTECT YOUR CHILDREN

October 1997

### SVI Technical Advisory Group Meets

*The Twelfth Technical Advisory Group Meeting on Vaccine-Preventable Diseases (TAG) was held in Guatemala, September 8-12, 1997. Formed in 1985 during the polio eradication campaign, the TAG meets every two years and functions as the leading forum to promote regional initiatives aimed at controlling and eliminating vaccine-preventable diseases. One of its main objectives has been to strengthen the policy dialogue on immunization among governments in the Region and participating agencies. The following are some of the major conclusions and recommendations*

#### Immunization in a Changing Policy Environment

All countries are moving toward delegating greater responsibility for delivery and management of health care services to local levels. This provides an opportunity to promote community participation and commitment of local health authorities.

However, with decentralization there remains a requirement at the central level to assure that immunization program goals are met in all areas of a country. Because almost all vaccine-preventable diseases can spread widely, successful control or elimination requires coordinated national and international efforts so that no area becomes a reservoir to seed infection into other communities and countries.

#### Recommendations

- National governments must maintain authority to monitor the implementation of immunization programs at the

state and local level and to take corrective actions should problems be detected.

- Vaccination and surveillance programs should be considered essential public goods and funded with public resources.
- Within the context of a changing environment to improve access to health services, vaccination coverage should be an indicator of the success of local and state delivery of services and a measure of the success of the health care reform and decentralization process.



Children wave their certificates proving that they have completed their vaccination schedule.  
Source: WHO/Ministry of Health, Mexico

#### Measles Eradication

Substantial progress has been made towards achieving the goal of measles eradication in the Americas. Transmission has been interrupted in many countries of the Region. The PAHO vaccination strategy (*catch-up, keep-up and follow-up*), where fully implemented, has proven to be highly effective. However, TAG pointed out that low levels of incidence can lead to a false sense of security. In the absence of measles transmission, susceptibles accumulate in a community, as a result of

failure to vaccinate all children and because primary vaccination does not protect 5 to 10% of those vaccinated. These susceptibles can sustain future measles outbreaks. To maintain a measles-free state will require ongoing efforts to minimize susceptibility using the complete strategy.

The measles eradication effort is not a local or even a national campaign but a hemisphere-wide program which

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can only be as strong as its weakest component. This is true on a global scale as well because many cases in this Region have been linked either epidemiologically or virologically to importations from outside this hemisphere. Thus, better worldwide measles control is important to the continued success of measles eradication in the Americas.

## **Recommendations**

### **General**

- The occurrence of epidemic measles in a major urban area poses, by far, the most serious threat to the overall program because of the possibility of widespread disease dissemination. Accordingly, it is important that program success in all urban areas (population of  $\geq 1,000,000$ ) be monitored on an ongoing basis by national authorities and reported to PAHO.

### **Vaccination Strategies**

- Routine vaccination of infants (*keep-up* vaccination) is a critical component of the PAHO measles eradication strategy.
- To maintain high population immunity among preschool-aged children, *follow-up* measles vaccination campaigns should be conducted whenever the estimated number of susceptible children 1-4 years of age approaches the number of children in one birth cohort.

### **Surveillance and Laboratory**

- Each country should periodically evaluate the quality of its surveillance system. PAHO has developed a protocol for rapid evaluation of surveillance systems which should be disseminated to all countries of the Region. A plan should be made for these evaluations in all countries as soon as possible.
- Laboratory confirmation is an essential part of the regional measles surveillance system. A single serum specimen collected at first contact with the health care system is sufficient for confirming measles.
- Virologic surveillance is important. Clinical specimens for viral isolation should be obtained from every chain of transmission. Urine, the most practical specimen to collect, should be obtained within 7 days of rash onset and forwarded to a laboratory to be properly processed.

### **Outbreak Response**

- Countries should not implement indiscriminate campaigns to vaccinate all adults against measles. Most adults are likely to be immune and achieving significantly higher levels of coverage among adults is extremely difficult. However, where surveillance has identified specific risk groups for measles among adults, such as university students, health care workers, or others, targeted vaccination efforts may be useful.

### **Management Indicators**

The following indicators are essential for monitoring the performance of the program.

#### Notification

- $\geq 80\%$  of reporting sites report on a weekly basis the presence or absence of suspected measles cases.

- $\geq 80\%$  of reporting sites report at least one suspected measles case per year.

#### Investigation

- $\geq 80\%$  of suspected measles cases are investigated within 48 hours of report.
- $\geq 80\%$  of suspected measles cases have a blood specimen collected if there is not an epidemiological link to a laboratory confirmed measles case.
- $\geq 80\%$  of measles chains of transmission have an identified source of infection.

#### Laboratory

- $\geq 80\%$  of specimens with results within 7 days of receipt in laboratory.

## **Poliomyelitis**

The hemisphere continues to be free of wild polio virus and surveillance indicators for the Region, as a whole, show that most countries are continuing to conduct adequate surveillance for acute flaccid paralysis (AFP) cases. However, the TAG noted a substantial deterioration in surveillance in some of the countries of the Region, raising concerns that future importations of wild virus could be missed.

- All countries must assure that adequate resources are devoted to polio surveillance. AFP surveillance must continue with ascertainment of at least one case annually of AFP per 100,000 < 15 years of age.
- For laboratory diagnosis, only one stool, collected within 15 days of onset of paralysis, is needed. Such specimens should be collected from at least 80% of AFP cases.
- An inventory of all laboratories in the hemisphere which have wild polio virus stocks should be completed as a first step toward the eventual destruction of all wild polio viruses as part of the global certification process.
- OPV remains the vaccine of choice in the Americas because it induces gut immunity, thus preventing spread of wild viruses if introduced, it is easy to administer, and it is relatively inexpensive.

## **Neonatal Tetanus**

Acceleration of NNT elimination activities in the Region of the Americas began in 1988 and great progress has been made. The annual number of cases in the Region decreased from 1,470 in 1988 to 312 in 1996, and the number of districts with multiple cases of NNT has also decreased.

## **Recommendations**

- Td should replace TT any time TT is indicated for vaccination of women of childbearing age, other adults, and older children to also improve protection against diphtheria.
- Surveillance and NNT case investigations should be improved in risk areas of endemic countries, particularly in areas from which information on coverage and cases is lacking.

## **Rubella and Congenital Rubella**

Available data indicate that rubella is prevalent throughout the Americas. Cases of congenital rubella syndrome

(CRS) and fetal infection have been documented in Barbados, Belize, Brazil, Cuba, Jamaica, Mexico, Panama, and Trinidad. It has been estimated that there are more than 20,000 infants born with CRS each year in the Americas in the absence of major epidemics.

### Recommendations

- All countries should incorporate rubella vaccine (as MR or MMR) into childhood vaccination programs, both as part of routine childhood immunization at 12-15 months and as part of the *follow-up* campaigns reaching children 1-4 years of age every 4 years.
- Countries implementing childhood rubella programs should make efforts to reduce the accumulation of susceptible adult female groups, such as post-partum vaccination, immunization in family planning clinics, and other settings where females can be vaccinated. Women should be vaccinated with MR or MMR vaccine to take advantage of the opportunity to increase immunity to measles.
- Surveillance of CRS (and rubella) should be initiated throughout the Americas and should begin before, or at the same time as, implementation of a rubella vaccination program.
- Countries wishing to prevent and control CRS promptly should carry out a one time mass campaign to vaccinate all females 5-39 years of age with rubella or MR vaccine.
- Countries wishing to prevent and control both rubella and CRS promptly should carry out a one time mass campaign to vaccinate both males and females 5-39 years of age with rubella or MR vaccine.

### Hepatitis B

It has been estimated that between 140,000 to 400,000 new cases of acute hepatitis B occur annually in the Americas. Two thirds of them are believed to occur in South America, primarily in areas within the Amazon Basin.

### Recommendations

- Routine vaccination of all children living in the Amazon Basin is recommended as well as in other areas, if any, with high endemicity (HbsAg prevalence equal or greater than 7%).
- Routine vaccination is also recommended for those at high risk of infection, such as health care workers and hospital staff.

### Yellow Fever

Between 1990 and 1996, 1,287 cases of yellow fever were reported in the Americas. As during the decade of the 1980s, 80% of these cases came from the Amazon Basin areas of Bolivia and Peru. However, important risk areas for yellow fever are also present in Brazil, Colombia, and Venezuela.

### Recommendations

- Incorporate vaccination against yellow fever into national immunization programs in high-risk areas and ensure that adequate quantities of vaccines and other supplies necessary to immunize against this disease are available at local health services.

### *Haemophilus Influenzae* type b (Hib)

Safe and effective vaccines against *Haemophilus influenzae* type b (Hib) have had an enormous impact in industrialized countries on Hib disease incidence, particularly meningitis and epiglottitis. Similar effects have also been observed in some countries in the Region (e.g. Uruguay and Chile) that have introduced Hib vaccine in their national immunization programs. It is possible that a larger impact on pneumonia will be observed in developing countries, as *Haemophilus influenzae* type b is an important pathogen in childhood pneumonias.

### Recommendations

- The TAG recommends the introduction of Hib vaccine in national immunization programs provided that adequate additional funds can be identified. However, implementation of Hib should not divert resources needed to sustain and enhance existing immunization efforts.

### Vaccines of Quality

Quality of vaccine is assured through both quality control of the final product, as well as Good Manufacturing Practices (GMP) during the entire manufacturing process. Both manufacturers and governments using vaccines are responsible for quality. Manufacturers must adhere to GMP that assure high quality of every lot (consistency of production). Governments must have adequate capacity to monitor manufacturers and their products.

### Recommendations

- Local vaccine manufacturers should participate in the PAHO Certification Program for Vaccine Producers.
- Local manufacturers should perform feasibility and viability studies of vaccine production to demonstrate their capability to supply vaccines of quality to immunization programs in a timely and continuous manner.
- Governments in the Region must institute National Control Authorities (NCA) appropriate to their vaccine production and purchasing policies.
- Immunization program managers should use only vaccines of known quality in their immunization programs.

### Research and Development: the Regional Vaccine Initiative.

Although governments recognize that vaccine and immunization are key to the control, elimination and eradication of vaccine-preventable diseases, this recognition has not been translated into concrete actions to promote and support research and development for vaccine production. Research and development teams in the Region are few and not coordinated among themselves or with vaccine producers. The introduction of new vaccines into national immunization programs in the Region may be facilitated if some existing public laboratories participate in the process.

Results obtained by the Pneumococcal Surveillance Network demonstrate the importance of inter-country collaboration and coordination to standardize laboratory and epidemiological methodologies for monitoring a specific

pathogen, to determine regional burden of disease, and to define particular characteristics of the burden such as serotype distribution or antimicrobial resistance. This system can be established and developed as the basis for a more comprehensive surveillance network for vaccine-preventable diseases.

**Recommendations**

- Formal programs for vaccine research and development must be established with appropriate financial resources, together with strong coordination at the country and regional level in order to potentiate existing research, development and production capabilities
- This initiative should give priority to the development of polysaccharide and polysaccharide conjugated vaccines as this methodology will provide vaccines against several important childhood pathogens such as *Haemophilus influenzae*, *Neisseria meningitidis*, *Streptococcus pneumoniae*, *Salmonella typhi*, and *Shigella* sp, responsible for significant mortality and morbidity in the Region

- The Network should collect information on cases and correlate those data with laboratory information to answer questions such as whether the increasing trend of antibiotic resistance has been associated with increased disease severity, complications, and cost. These data will be important in guiding clinical management and future policies for pneumococcal vaccination

**Technical Advisory Group Members**

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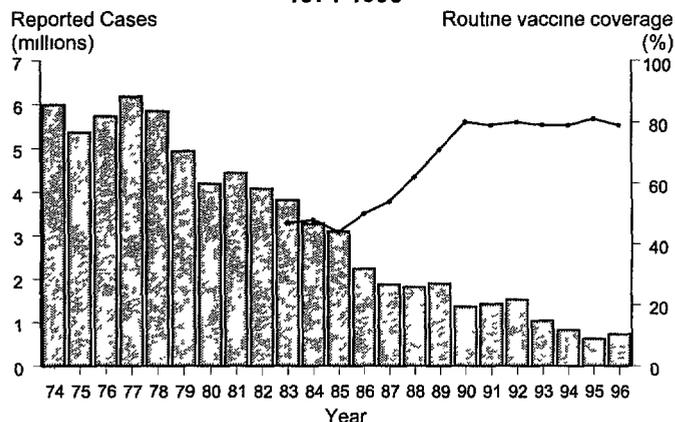
For a complete version of the TAG conclusions and recommendations, please contact SVI in Washington, D.C.

## Third Global Roundtable on Measles Control and Elimination

*The Third Meeting on Advances in Measles Control and Elimination was held in August 27-29, in Atlanta, Georgia. This consultative meeting is co-sponsored by PAHO, the Centers for Disease Control and the World Health Organization.*

The progress made in the global fight against measles and interruption of transmission has been demonstrated in several countries, reinforcing the view that measles eradication is technically feasible using existing vaccines and intervention strategies. This has generated a positive trend in measles control and elimination (Figure 1).

**Figure 1**  
**Global annual reported vaccine coverage and measles cases 1974-1996**



Source: WHO/EPI Information System

The countries of the Americas are well underway in their efforts to eliminate the disease by the year 2000 and the Pacific Island nations are expected to make a similar commitment in the near future. The European Advisory Group has recommended an elimination target date of 2007 and it is anticipated that the Regional Committee will consider this goal at its 1998 meeting. The Regional Committee of the Eastern Mediterranean will consider an elimination target of 2010. China and several southern African countries have embarked on accelerated measles control/elimination approaches.

A decision to eradicate measles worldwide will have a tremendous impact on infant morbidity and mortality. Despite the availability of an effective vaccine, measles continues to cause 42 million cases and nearly 1 million deaths per year worldwide. Global coverage with measles vaccine is estimated at 79%. Most measles deaths occur among children under five years of age living in developing countries, particularly in Africa. This is because many children remain unprotected, particularly in poor urban areas where the case fatality is highest. The disease thrives in cities, in poor urban areas where crowding, poor sanitation and low measles vaccination coverage ensure ongoing circulation of the virus. Participants at the Atlanta meeting agreed it would be important to support urban immunization strategies to control measles in low-income countries with high population density, with special emphasis on populations that have not yet been reached.

The successful completion of the global polio initiative will facilitate further progress towards measles elimination. There was consensus that polio eradication and measles elimination activities can be mutually reinforcing and represent a natural joining of efforts. However, participants highlighted that while the global efforts to eradicate polio are progressing well, much remains to be done, particularly in the Indian sub-continent and Africa. Therefore, while it is important to start planning for regional elimination of measles and ultimate eradication before the polio goal is completed, new measles activities should not jeopardize progress toward polio eradication. It will be important to initiate programs to interrupt transmission early in some of the most difficult countries in Africa, to determine the most effective strategies in these settings and demonstrate what can be done.

Sustaining interruption of measles transmission is difficult and expensive. As increasing areas of the world achieve elimination, participants agreed that the goal of global measles eradication be set and achieved in a short period of time. This will require close and effective partnerships between official agencies, private and voluntary sectors, and external donors as it was done in the Americas during the polio eradication years. A major hurdle to further improve control in areas that have obtained the greatest case reductions, such as the Americas and the United Kingdom, is the ongoing circulation of measles virus in other parts of the world. While the reported incidence rate in the Americas was only 0.7 cases per 100,000 population in 1995, the reported rates in other regions were much higher. The rate in Africa was 83 times greater than the rate in the Americas, and the rate in Europe and the Western Pacific region were 13 to 10 times greater respectively.

For sustainable impact, there was consensus that it would be important to continue strengthening the primary health care system and EPI in developing countries to achieve and maintain acceptable levels of measles control. Measles elimination is already underway in many areas but global eradication will most likely pose a number of additional challenges. Elimination activities must be integrated within primary health care to ensure the maintenance of progress and to pave the way for future elimination/eradication initiatives.

### Next Steps

Programmatic and financial obstacles must be overcome if eradication is to be achieved and strategies will need to be adjusted based on accumulating experience. Competing priorities may create difficulties in raising political commitment to measles control/elimination/eradication. Many of the poorest countries will require significant external support. The amount of additional backing needed should be estimated soon to enable appropriate planning.

Key to rally political support for global measles eradication will be the availability of estimates of the overall cost of a global campaign. It will also be important to consider the marginal and opportunity costs of undertaking elimination or eradication. So far, different approaches have been taken to assess the economic costs, benefits and effectiveness of

measles control/elimination/and eradication efforts. They all show that measles control is highly-cost effective and that improvements in control are also highly cost-effective and may be cost-saving in some countries. Greater agreement on appropriate approaches to economic analysis would be useful, particularly with respect to eradication.

Measles eradication can convey two lasting benefits. The *first*, absence of measles disease (and the need for measles immunization), is obvious and indisputable. The *second*, permanent contribution to the development of health services, is a potential benefit which requires specific attention to maximize the benefits that can accrue to the overall health system from eradication efforts. Specific benchmarks should be developed to monitor interaction of eradication efforts and primary health care development.

Once countries progress from control to elimination goals, surveillance strategies need to be further developed and implemented to allow assessment at the most peripheral level. Based on the experience in the Americas, participants representing developed and developing countries stressed the need to implement the recommended vaccination strategies for measles eradication in full throughout a country or region. PAHO's vaccination strategy for measles eradication, which has been adopted in most countries in the Region, consists of a one-time mass vaccination campaign of all children 1-14 years of age, high coverage through routine vaccination of 1 year olds, and periodic *follow-up* vaccination to reduce the accumulation of susceptible infants and children 1-4 years of age.

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## Ecuador Approves Vaccine Law

Ecuador has joined Venezuela in winning congressional approval of a Vaccine Law in September, 1997. Venezuela approved an Immunization Law in March of 1996, which includes a specific item addressing the availability of vaccines for the country's immunizations programs. This breakthrough in both countries is an indication of national commitment for immunization programs by all branches of government. PAHO is actively collaborating with legislators in the Region to ensure that similar laws are enacted elsewhere.

In Ecuador, the Vaccine Law was an initiative of Congressman Miguel Lopez (Pachakutik). Following the launching of the EPI in the Americas in 1977, Ecuador was the first country to initiate a national EPI. At the time Dr. Asdrubal de la Torre held the post of Minister of Health. Twenty years later, Dr. de la Torre has played a key role in making Ecuador adopt a law that will ensure the sustainability of routine immunization programs.

Starting from 1998, a specific budget line of no less than US\$ 2.5 million will be incorporated into the national budget to cover recurrent costs of vaccines and other inputs needed for the country's EPI. The law stipulates that this amount cannot be used for other purposes, nor shall there be any reductions.

# Measles Update

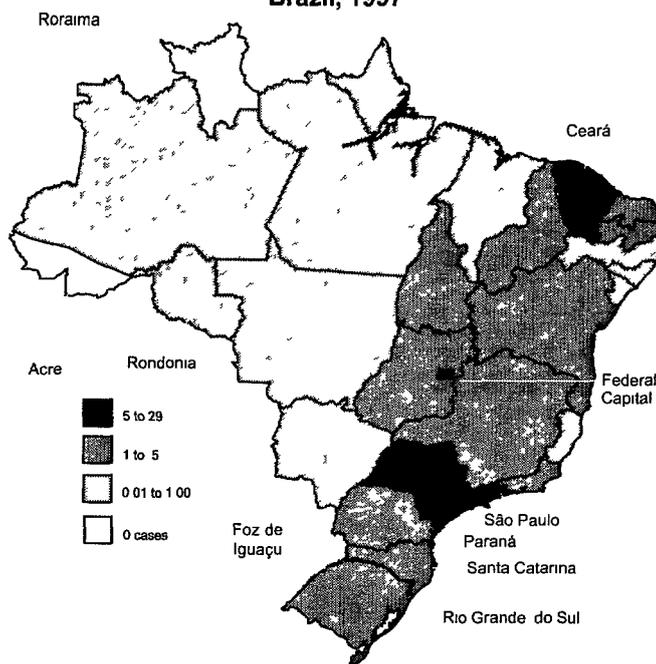
As of week 40 (October 4, 1997), a total of 48,118 suspected measles cases have been reported to the Brazilian Ministry of Health. Of these, 39,929 were reported in the State of Sao Paulo, which with a population of approximately 34 million is the most densely populated state of the country. So far 12,343 cases have been confirmed, most of them by laboratory testing, with a positive finding of IgM in blood samples.

Only two states (Acre and Roraima) have not reported confirmed cases of measles. The incidence rate by 100,000 inhabitants is the highest in Sao Paulo (28.2), second and third are Brasilia, the Federal Capital, and the state of Ceará (see map). Several municipalities with borders with Paraguay, Uruguay, Argentina and Bolivia have confirmed circulation of measles virus and include P. Velho in the state of Rondonia (2 cases), three municipalities in the state of Paraná (70 cases), four municipalities in the state of Santa Catarina (20 cases) and one municipality in the state of Rio Grande do Sul (1 case). The most notable international transmission can be observed between the border cities of Foz de Iguacu in Brazil and Ciudad del Este, Paraguay, with more than 90 cases. This area attracts many tourists because of the Iguacu waterfalls and there is also high commercial activity here between the two countries.

In the current outbreak, infants and persons between 20 and 29 years of age have been the most vulnerable. Their respective attack rates were 45.3 and 19.1 per 100,000 persons. The attack rate among the group of 1 to 4 years of age was 5.5 per 100,000 persons. The highest number of patients (5,451) are between the ages of 20 and 29 years of age. The above mentioned age group consists of those who were born too early for routine vaccination, but too late to have been exposed to circulating measles virus. The groups between 1 and 20 years old who have benefited from vaccination present the lowest attack rates in this outbreak.

In the state of Sao Paulo a campaign aimed at children under the age of 5 was organized in August, reaching 100% of children in that age group, regardless of previous vaccination status. A preliminary analysis has shown that the number of confirmed cases from Sao Paulo has dropped from approximately 700 cases per day in August before the campaign, to approximately 50 cases per day in September. At the national level, a campaign was held on October 25, during which most children under 5 years of age were vaccinated against poliomyelitis and measles.

**Incidence rate of confirmed measles cases by state  
Brazil, 1997**



Source: GT-Sarampo/CNDI/CENEPI/FNS/MS  
Incidence rate per 100,000 population  
Data as of week 40, 1997

## Safe Destruction of Vaccine Vials

Recently, there have been several inquiries from health services in the Region regarding the safe disposal of vaccine vials. In an effort to standardize procedures, SVI recommends the following:

Vaccine vials should be discarded when

- they are past their expiration date and the quantity of vaccines involved does not justify re-testing, or
- they have been exposed to excessive heat and the quantity involved does not justify re-testing, or
- they have been re-tested and have shown to have lost their potency, or
- open vaccine vials have not been used within the

recommended time (see *EPI Newsletter*, August 1992, page 4), even if stored at the proper temperature.

In order to avoid the improper use of vaccines that fit the above description outside the health services and to prevent accidental injuries that can be caused by glass vials, SVI recommends the following two disposal methods:

- Incineration
- Burying

Incineration is the preferred method for the destruction of unused vaccine vials for health services that have access to this technology. If not available, the health service should bury the vaccine vials in a deep hole.

# Reported Cases of Selected Diseases

Number of reported cases of measles, poliomyelitis, tetanus, diphtheria, and whooping cough, from 1 January 1997 to date of last report, and the same epidemiological period in 1996, by country

Country/Territory	Date of last report	Measles				Polio		Tetanus				Diphtheria		Whooping Cough	
		Confirmed 1997			Confir- med* 1996	1997	1996	Non Neonatal		Neonatal		1997	1996	1997	1996
		Labo- ratory	Clini- cally	Total				1997	1996	1997	1996				
Anguilla	20 Sep	0	0	0	0	0	0								
Antigua & Barbuda	20 Sep	0	0	0	0	0	0	0		0		0			0
Argentina	5 Jul	0	1	1	38	0	0	18	33	3	4	0	1	321	433
Bahamas	20 Sep	1	0	1	0	0	0	0	0	0	0	0	0	0	0
Barbados	20 Sep	0	0	0	0	0	0	0		0	0	0		0	
Belize	20 Sep	0	0	0	0	0	0	2	0	1	0	0	0	0	0
Bermuda	20 Sep	0	0	0	0	0	0	0				0		0	
Bolivia	20 Sep	0	0	0	3	0	0	2	4	7	6	1	1	77	11
Brazil	20 Sep	8,820	231	9,051	130	0	0	58	13	13	5	32	0	101	79
British Virgin Islands	20 Sep	0	0	0	0	0	0	0		0		0		0	
Canada	20 Sep	577	—	577	295	0	0		1						1,112
Cayman Islands	22 Mar	0	0	0	0	0	0	0		0		0		0	
Chile	20 Sep	38	0	38	1	0	0	1	4	0	0	0	0	117	245
Colombia	20 Sep	5	5	10	20	0	0	18	85	17	22	2	40	15	12
Costa Rica	20 Sep	1	1	2	5	0	0	2		0				10	
Cuba	20 Sep	0	0	0	0	0	0	0	3	0	0	0	0	0	0
Dominica	20 Sep	0	0	0	0	0	0	0		0	0	0		0	
Dominican Republic	20 Sep	1	0	1	0	0	0	17	21	0	0	4	6	1	2
Ecuador	20 Sep	0	0	0	19	0	0	42	89	19	32	17	15	148	67
El Salvador	20 Sep	0	0	0	1	0	0	3		2		0		2	
French Guiana	22 Mar	0	0	0		0	0								
Grenada	20 Sep	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Guadeloupe	22 Mar	72	0	72	1	0	0								
Guatemala	20 Sep	2	0	2	0	0	0	5	2	6	10	0	0	92	24
Guyana	20 Sep	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Haiti	22 Mar	0	0	0		0	0								
Honduras	20 Sep	0	4	4	1	0	0	5	9	1	4	0	0	121	134
Jamaica	20 Sep	0	0	0	0	0	0	2		0		1		4	
Martinique	22 Mar	0	0	0		0	0								
Mexico	23 Aug	0	16	16	19	0	0	95	14	16	10	0		24	0
Montserrat	22 Mar	0	0	0	0	0	0	0				0		0	
Netherlands Antilles	22 Mar	0	0	0		0	0								
Nicaragua	20 Sep	0	0	0	1	0	0	10	10	0	1	0	0	41	6
Panama	20 Sep	0	0	0	0	0	0	1	2	1	0	0	0	84	0
Paraguay	20 Sep	30	1	31	4	0	0	24	23	11	8	0	0	24	13
Peru	20 Sep	0	1	1	63	0	0	42	44	26	36	1	4	608	203
Puerto Rico	20 Sep	0	—	0	6	0	0								
St Vincent/Grenadines	20 Sep	0	0	0	0	0	0	0		0		0		0	
St Kitts/Nevis	20 Sep	0	0	0	0	0	0	0		0		0		0	
St Lucia	20 Sep	0	0	0	0	0	0	0		0		0		0	
Suriname	20 Sep	0	0	0	0	0	0	2	4	0	1	0	0	0	2
Trinidad & Tobago	20 Sep	1	0	1	0	0	0	2	15	0	0	1	0	7	56
Turks & Caicos	20 Sep	0	0	0	0	0	0	1		0		0		0	
United States	20 Sep	107	—	107	440	0	0								481
Uruguay	20 Sep	0	0	0	0	0	0	0	1	0	0	0	0	10	15
Venezuela	20 Sep	1	0	1	12	0	0	18		6	5	0	0	393	135
<b>TOTAL</b>		<b>9,656</b>	<b>260</b>	<b>9,916</b>	<b>1,059</b>	<b>0</b>	<b>0</b>	<b>370</b>	<b>377</b>	<b>129</b>	<b>144</b>	<b>59</b>	<b>67</b>	<b>2,200</b>	<b>3,030</b>

Data not available

— Clinically confirmed cases are not reported

\* Laboratory and clinically confirmed cases

# First Ladies United Against Measles

The First Ladies of the Americas and designated representatives held their *Seventh Conference of Wives of Heads of States and Government of the Americas* in Panama on October 8-9, 1997, under the motto "Let us Build the Future of the Americas with Human Rights and a Culture of Peace", to evaluate achievements attained and renew their commitment to address the Region's pressing social problems

"We reiterate our willingness to be mobilizers, facilitators or convenors for social policies and programs serving our countries, focusing on vulnerable groups, in accordance with our respective national interests and inspired by dialogue, negotiation and mutual respect," the First Ladies stated in their final communique, the Panama Declaration

The First Ladies of the Americas have already been working on behalf of measles eradication since 1995, when they presented a Plan of Action during their Fifth Meeting in Bolivia, that complements the activities undertaken by each country. In the Panama Declaration, the First Ladies re-stated their support to the Regional measles eradication goal by the year 2000

"We value the work done in countries of the Region which support the elimination of measles and other preventable diseases in the Americas. We also reiterate our commitment to continue our

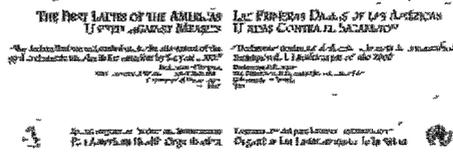
assistance toward this effort until measles is eradicated," the final text says

The First Ladies recognized the valuable participation and contribution of international organizations and financial institutions stating that they have "supported our endeavors and are making possible the execution of projects and programs that serve the most needy and vulnerable sectors of our societies"

The support of the First Ladies will be critical to provide greater dissemination of the measles eradication initiative at the national and international level

Major obstacles for the achievement of this goal are

- Insufficient dissemination and promotion of the Plan of Action for Measles Eradication at the national/municipal level
- Insufficient resources to achieve the measles eradication goal
- Routine vaccination coverage < 90%
- Inadequate logistical support for investigating all suspected measles cases
- Limited participation of the private sector and non-governmental organizations in reporting suspected measles cases



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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ISSN 0251-4729

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# EPI Newsletter

## Expanded Program on Immunization in the Americas

Volume XIX, Number 6

IMMUNIZE AND PROTECT YOUR CHILDREN

December 1997

### Measles in the Americas, 1997

Following an all-time record Regional low in the Americas of 2,109 confirmed measles cases in 1996, there has been a resurgence of the disease in 1997 in Brazil (Figure 1). Through 29 November 1997, a total of 75,236 suspected measles cases were reported from the countries of the Americas. Of these, 26,950 (35.8%) have been confirmed, 24,527 (32.6%) have been discarded, and 23,080 (30.6%) remain under investigation. Of the total confirmed cases, 26,508 (98.3%) have laboratory confirmation of measles infection or epidemiological linkage to a laboratory confirmed case, and 442 (1.6%) have been confirmed on clinical grounds alone. Together, Brazil (25,900 confirmed cases) and Canada (577 confirmed cases) accounted for 98.2% of the total confirmed cases in the Region. However, it should be pointed out that Canada has had no cases for the last 18 weeks. Other countries reporting measles cases include Guadeloupe (128 cases), the United States (127 cases), Paraguay (124 cases), Argentina (58 cases), Chile (47 cases), and Costa Rica (14 cases).

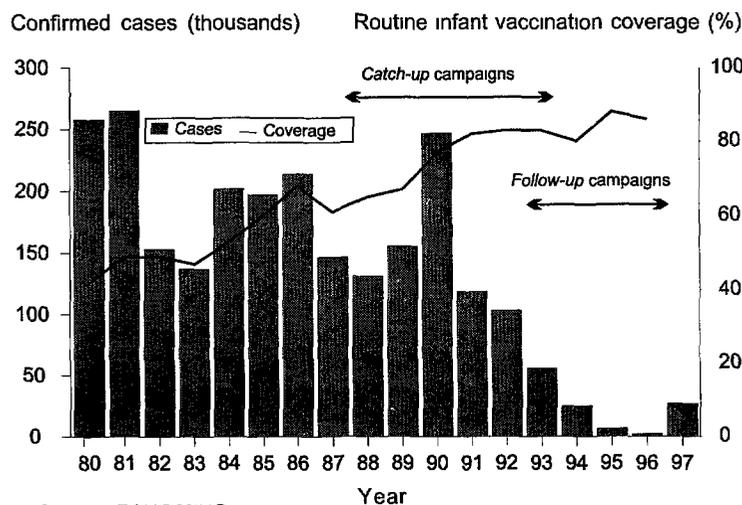
The majority of cases from Brazil have been reported from Sao Paulo State, the only state in the country which did not conduct a *follow-up* vaccination campaign in 1995. To date, over 20,000 cases have been confirmed in this outbreak, with most cases in the city of Sao Paulo. Over 50% of

cases have occurred in young adults 20-29 years of age. The highest age-specific incidence rates are in infants, young adults 20 to 29 years of age and children 1-4 years of age, respectively. To date, over twenty-five measles-related deaths have been reported, most in infants less than 1 year of age.

An investigation of measles cases in adults found that the majority were occurring among young adults who were members of certain risk-groups including men who recently migrated to cities from rural areas in the Northeast of the country to work in construction projects and other manual labor, students, health care workers, persons working in the tourist industry, and military recruits.

Measles virus has been isolated from several patients from this outbreak at the measles laboratory of the Adolfo Lutz Institute in Sao Paulo. Genomic sequencing of these isolates conducted at the Centers for Disease Control and Prevention (CDC) Atlanta, USA, revealed that the virus circulating in Sao Paulo is virtually identical to virus currently circulating in Western Europe. Although an index imported measles case has not been identified, the molecular epidemiology data strongly suggest that the virus responsible for the Sao Paulo outbreak was imported from Europe.

**Figure 1**  
Reported measles cases in the Americas, 1980-1997\*\*



Source: PAHO/WHO  
\* Coverage for children at one year of age  
\*\* Cases reported through 29 November 1997

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The Sao Paulo outbreak is waning after implementation of an aggressive outbreak response, which included a *follow-up* campaign targeting all children 1-4 years old, selective *mop-up* vaccination in schools and vaccination of young-adult members of groups at high-risk for measles

Measles virus has spread from Sao Paulo to nearly every other state in Brazil. States most affected include Rio de Janeiro, Ceara, Minas Gerais, Bahia, Parana, Rio Grande do Sul, Mato Grosso do Sul and the Federal District (Brasilia). Moreover, spread has been reported from several other countries in the Region, including Paraguay, Chile, Argentina, Peru, Costa Rica, and the United States

A total of 577 confirmed measles cases were reported from Canada. A large outbreak with over 300 cases occurred primarily among young adults affiliated with Simon Fraser University, near Vancouver. This outbreak came somewhat as a surprise since the Province of British Columbia had just completed its school *catch-up* campaign in 1996. Genomic analysis of measles virus obtained from this outbreak performed at the Laboratory Centres for Disease Control suggests that measles virus was imported from Europe

Measles virus from the British Columbia outbreak spread to school-aged children in Alberta, where 245 cases were reported. Other sporadic cases or small clusters have occurred in various Canadian provinces, mostly among adults due to importations. Since 1996, a total of 17 imported measles cases were documented in Canada, mostly from Europe and Asia. Since the end of July 1997, however, not a single measles case has been detected and transmission appears to have been interrupted in Canada.

To date, 127 confirmed measles cases have been reported during 1997 in the United States. This is the lowest number of cases ever reported in the United States, and is well below half the previous record low incidence of 309 cases in 1995. Almost half of the cases are documented importations. Spread from importations has been limited and the largest outbreak this year is only 8 cases. In 1995 and 1996, there were no measles importations from Latin America or the Caribbean. In 1997, however, there were 5 confirmed imported cases from Brazil.

Between October 1996 and May 1997, a large measles outbreak occurred in the French department of Guadeloupe. This island had not implemented PAHO's recommended measles eradication strategy. A total of 128 confirmed

measles cases were reported. The majority of cases occurred in unvaccinated persons 12 to 18 years of age. The source of the outbreak is thought to be an unvaccinated 10 year old child visiting from metropolitan France. Moreover, genetic analyses of measles virus obtained from the outbreak revealed that the virus circulating in Guadeloupe is very similar to virus circulating in Europe. The Ministry of Health conducted a mass vaccination campaign in affected schools. Efforts were made to provide measles vaccine to all students without documentation of having received two doses of measles vaccine. Over 3,000 students were vaccinated.

Until 1997, the English-speaking Caribbean had not reported a single confirmed case of measles in over 5 years. However, in 1997 two laboratory-confirmed measles cases were detected. The first confirmed case was reported from the Bahamas. The patient, a young adult, had rash onset in March. The direct source of transmission was not identified, however, it is strongly suspected that the patient contracted

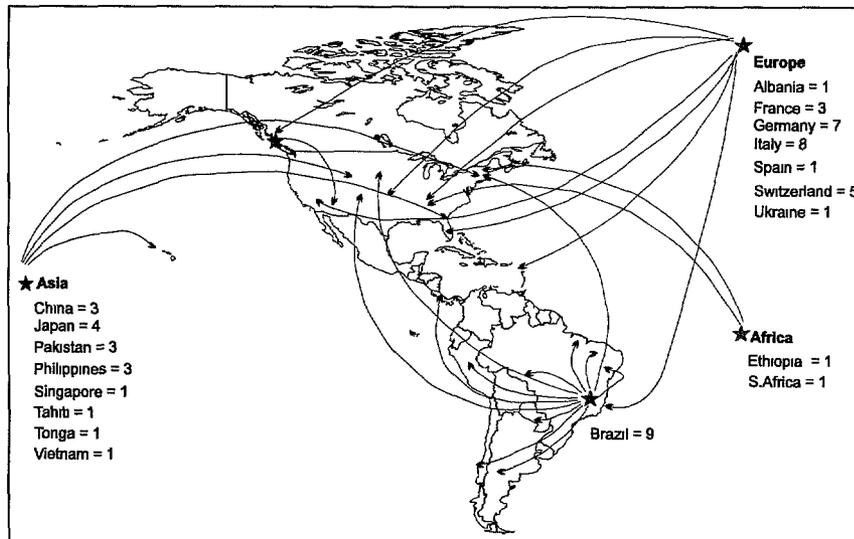
measles from a tourist. A search has been made in the country to identify any additional cases of measles. This search involved a review of over 80,000 diagnoses from health facilities in the country. The second case was reported from Trinidad and Tobago. It occurred in a young adult Italian sailor who had rash onset in April. The patient had acquired measles in Italy. A specimen was collected and found to be positive for measles IgM at the measles laboratory of the Caribbean Epidemiology

Centre (CAREC). No spread cases were identified despite careful investigation.

**Editorial Note:** While the resurgence of measles in the Americas during 1997 represents a major increase compared to cases reported in 1996, these cases represent only about 10% of cases reported in 1990. Nevertheless, important lessons can be learned from this experience which can be used to "fine-tune" the Region's measles eradication strategy and to assure its full implementation in all countries. The outbreak in Brazil can be considered a wake-up call to the countries of this Hemisphere to demonstrate that the absence of measles virus circulation does not mean absence of risk from measles infection.

Several factors combined to create conditions which facilitated widespread measles transmission in Sao Paulo. First, the lack of a timely *follow-up* vaccination campaign in 1995 for children aged 1 to 4, combined with low routine vaccination coverage (*keep-up*) among infants using a two-

**Figure 2**  
**Measles Importations into the Region of the Americas, 1997\***



Source: SVI/PAHO and CDC

\* Data as of 29 November 1997

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dose schedule allowed for a rapid and dangerous accumulation of susceptible children. Second, the presence of large numbers of young adults who, for a variety of reasons, escaped both natural measles infection and measles vaccination increased the risk of a measles outbreak. Third, measles virus was imported into Sao Paulo, probably from Europe. Finally, the high population density of the city facilitated contact between persons infected with measles and susceptible persons.

Measles case surveillance data, combined with molecular epidemiologic information provided by PAHO's measles laboratory network, suggest that the countries of the Americas are constantly being challenged by imported measles virus from other regions of the world where measles remains endemic. During 1997, 23 separate importations of measles virus were detected from Europe, 17 from Asia and 2 from Africa (Figure 2) that resulted in measles transmission. These data, however, probably severely underestimate the true number of measles importations since many imported cases may not seek medical care and do not result in further transmission.

In addition to the challenge of imported measles virus, the outbreaks in Brazil, Canada and other countries of the Region suggest that there may be a significant number of young adults who remain susceptible to the disease. While PAHO's recommended vaccination strategy for measles eradication primarily targets infants and children, a small percentage of adolescents and young adults may have escaped both natural measles infection and measles vaccination. Furthermore, some young adults may have been vaccinated, but failed to respond immunologically. These young adults remain susceptible to measles.

For practical purposes, persons born before 1960 in most countries of the Americas can be assumed to have been exposed to naturally circulating measles virus, and thus be immune to the disease. Therefore, the overwhelming majority of adults are already immune, and most susceptible young adults are at very low risk for being exposed to measles virus. Mass campaigns among young adults are not recommended.

Experience has shown that certain institutional settings such as colleges and universities, military barracks, health care facilities, large factories and prisons can facilitate measles transmission, if measles virus is introduced to such populations. The close contact among persons in these settings increases the risk that a susceptible person can be exposed to measles. In fact, numerous measles outbreaks among adolescents and young adults have been documented in these settings, even in institutions with high measles vaccination coverage. In addition to persons living or working in these settings, adolescents and young adults who travel to countries with endemic measles transmission are at increased risk for being exposed to and contracting measles.

Moreover, in recent years many countries have experienced the migration of young adults from rural areas to urban areas for economic reasons. Because measles circulates more freely in cities with high population densities, persons who have recently migrated from rural areas with low population densities (and therefore lower risk for having been exposed to circulating measles virus), may be at

relatively increased risk of measles susceptibility. When these persons congregate in institutional settings which can facilitate virus transmission, they have greater risk for acquiring measles, should the virus be introduced.

To prevent the occurrence of measles outbreaks among adolescents and young adults, efforts are needed to assure measles immunity in groups potentially at high-risk for measles, including college and university students and professors, health care workers, military personnel, young adults working in large factories, young adults residing in institutions such as prisons and long-term care facilities, and persons traveling to measles endemic countries.

Vaccination of adolescents and young adults entering such facilities should be routine and ongoing and should take place **before** persons begin working or living in these high-risk settings. Moreover, *catch-up* vaccination activities may be considered for adolescents and young adults already in such settings. Young adults who are planning to travel to parts of the world where measles virus continues to circulate should be advised to be vaccinated before departing. These measures will enhance immunity levels in such population groups and help prevent measles outbreaks in these settings, should the virus be introduced.

The measles experience of 1997, clearly demonstrates that there are two major challenges to the Region's measles eradication goal by the year 2000. First, the countries of the Americas need to keep up their guard by maintaining the highest population immunity possible in infants and children, and targeting vaccination to adolescents and young adults who are at highest risk for being exposed to measles virus. Second, increased efforts are needed in other regions of the world to improve measles control and to decrease the number of exported measles cases to the Americas. As long as measles virus circulates anywhere in the world, the Americas will remain at risk for measles. The successful completion of the measles eradication goal will require full implementation of PAHO's recommended vaccination strategy in all countries of the Region and improved measles control/elimination in other regions of the world, especially Europe and Asia. As mentioned previously, the only way for the Americas to assure regional measles eradication will be through the ultimate global eradication of measles virus.

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## USAID Grant for Hib Surveillance

The United States, through its Agency for International Development (USAID) has approved a US\$ 50,000 grant to support epidemiological surveillance of *Haemophilus influenzae* type b (Hib) in Latin America and the Caribbean. A Regional surveillance system for Hib and other bacteria responsible for meningitis and respiratory diseases will generate important information to accurately determine disease burden and convince decision makers to incorporate a vaccine against the disease in regular immunization programs.

The overall incidence of Hib meningitis at ages 0 to 4 years has been initially estimated to be at least 35 per 100,000. This means that there would be more than 20,000 cases annually in the Americas.

# Caribbean Meeting Stresses Surveillance

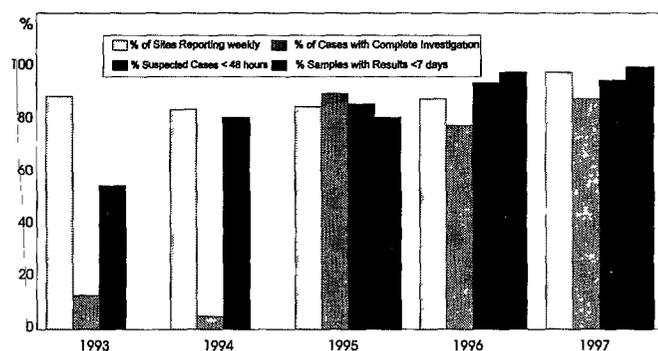
The following are some of the major conclusions and recommendations of the Fourteenth Meeting of the Caribbean EPI Managers held in Castries, Saint Lucia, from 18-20 November 1997. The meeting was officially opened by Her Excellency the Governor of Saint Lucia, Dr Pearlette Louisy and the Honorable Minister of Health, Ms Sara Flood delivered the keynote address

## Measles Eradication

The English-speaking Caribbean still holds the longest record in the Western Hemisphere of six years without indigenous measles transmission. Two recent importations into the Bahamas and Trinidad and Tobago stressed the danger of importations and the need for adherence to PAHO's measles eradication strategy, particularly the maintenance of high levels of immunization coverage and periodic implementation of *follow-up* campaigns. A large outbreak in Guadeloupe (please refer to page 2), in late 1996, illustrates the vulnerability of the countries to measles transmission if the strategy is not fully implemented.

The measles laboratory at the Caribbean Epidemiology Center (CAREC) provides confirmation for suspected measles cases (Figure 1). The laboratory is able to test for IgM antibodies for measles, rubella and dengue infections. Through week 44 of 1997, a total of 847 specimens had been submitted for laboratory confirmation. Of these, 2 (0.2%) were positive for measles, 276 (31.5%) were positive for rubella and 11 (1.3%) were positive for dengue. All specimens were tested and reported back to countries within seven days of receipt.

**Figure 1**  
Measles surveillance indicators in the English-speaking Caribbean and Suriname 1993-1997\*



Source: MOH Reports to EPI/CAREC

\* Data as of 25 October 1997 (Epidemiological week 43)

## Recommendations

- MR or MMR are the vaccines of choice for measles and rubella elimination
- Countries that are instituting a two-dose schedule should be aware that even with such a regimen, susceptibles will accumulate because coverage with two doses will never

achieve 100% and some children will remain unvaccinated. *Follow-up* campaigns are required to maintain interruption of transmission.

- To maintain the English-speaking Caribbean and Suriname free of measles, high vaccination coverage must be maintained. Efforts need to be made to ensure that at least 95% of each birth cohort is vaccinated with measles-containing vaccine at 12 months of age.
- The possibility of combining measles and rubella surveillance should be explored.
- To prevent the accumulation of susceptible preschool-aged children from reaching dangerous levels, *follow-up* campaigns should be conducted among children 1-4 years every 4 years. Countries should plan on conducting *follow-up* campaigns in the year 2000.
- The Brazil experience suggests that certain young adults may be at risk for measles. Efforts are needed to assure measles vaccination in young adults in high-risk groups, which include students, migrant workers, health care workers and the military.
- As long as measles circulates anywhere in the world, the English-speaking Caribbean will be at risk for measles importations. Measles surveillance systems need to detect these importations in a timely manner and respond accordingly when they occur.

## Poliomyelitis

Presentations on polio stressed the importance of continuing technical and political commitment to surveillance and vaccination activities to keep the region polio-free. Although progress is being made towards global eradication of polio, importations still represent the biggest threat. All English-speaking Caribbean countries were making great efforts in sending all cases with stool samples for laboratory testing, one of the surveillance indicators. However, it was noted that the other three critical surveillance indicators were not consistently being met from countries that notified cases. Periodic evaluations of surveillance for acute flaccid paralysis (AFP) were recommended at all major health facilities to see if cases are being missed.

## Rubella and CRS

Since 1982 significant rubella virus activity has been recorded in many CAREC-member countries, and cases of congenital rubella syndrome (CRS) have been documented as sequelae to these outbreaks. Following a *catch-up* measles campaign (Big Bang) in 1991, very low rubella incidence (fewer than 2.0 cases per 100,000 population) was recorded between 1992 and 1995. However, since the beginning of 1995 and continuing through 1997, sizable outbreaks of rubella have occurred in Jamaica, Barbados, Trinidad and Tobago, Guyana, and Belize. In 1996, rubella incidence rates of 10.3 cases per 100,000 population were recorded. To date, more than 20 cases of CRS have been reported since 1996.

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The Bahamas implemented a major campaign with MMR targeting all individuals 4-40 years old in July of this year, aimed at the interruption of rubella transmission. The lessons from this initiative will be extremely useful to all other countries that are planning to eliminate rubella and CRS.

### Recommendations

- It is imperative that Ministries of Health discuss and arrive at a consensus position with regard to the objective of rubella elimination.
- There is overwhelming evidence, both from estimated figures as well as from data collected over the last year, particularly in Guyana, Barbados and a regional review presented by CAREC, that the burden of rubella and its cost, both in financial terms and human suffering, warrant efforts towards its elimination.
- The Technical Advisory Group Meeting (TAG) held in Guatemala in September, 1997 outlined the strategies for the elimination and control of rubella and CRS. These include a one-time mass vaccination of all individuals, male and female, within a certain age range that will vary from country to country, but should cover individuals up to 35 years of age. The lower level age group will be defined by the previous vaccination activities that included rubella-containing vaccine.
- During 1998, senior MOH officials and political leaders in all countries should define national policy regarding rubella and CRS elimination, aiming at a Pan-Caribbean initiative. The conference of Ministers of Health, to be held in April of 1998, their Caucus in September and the current revision of the Caribbean Cooperation in Health (CCH) represent excellent opportunities for achieving consensus on this issue.

### Immunization Coverage

The average coverage rates for all 19 countries were: DPT 89%, OPV 89%, measles containing vaccine 92%, and BCG 95%. Over 90% of the infant vaccinations in the countries are administered by the public sector through a network of clinics. However, not all countries have been able to attain very high coverage, and some still show rates between 80-85%. These are due to pockets of low coverage occurring in certain geographic areas, e.g., remote rural areas and dense urban centers. A review of coverage data for the English-speaking Caribbean for the period 1994-1996, indicates that special activities need to be carried out particularly in Suriname, Grenada, Guyana and Belize to reach coverage above 90%.

### Introduction of New Vaccines

Vaccines currently being discussed for introduction in the English-speaking Caribbean are hepatitis B and *Haemophilus influenzae* type b (Hib). These two vaccines are already being administered, primarily by the private sector in the English-speaking Caribbean. In 1996, the private sector bought 42,208 (20mcg) adult-dose vials of hepatitis B. Pediatric doses accounted for about 6,000, and these could only fully immunize 1.4% of the birth cohort of the Caribbean Member Countries.

Whereas four countries are using hepatitis B vaccine in the public sector (1.7% of the sub-region total birth cohort) only two are using Hib vaccine. The uptake in the private sectors is 28,128 doses of Hib vaccine, which can only vaccinate 5-9% of the region's infants (the birth cohort for 1996 was 140,311).

### Recommendations

- The introduction of new vaccines into a national immunization program should not simply reflect their availability, but should follow a careful investigation of their appropriateness to that particular epidemiology, and whenever possible, evidence that their introduction into routine use would be a cost-effective use of resources.
- The extensive experience of the Caribbean in implementing immunization campaigns will be invaluable in the introduction of new vaccines for routine use. All countries in the region should strive to introduce these vaccines in the public sector within the next three years.

### Booster Dose Policy

A panel discussion revealed a great variety of schedules for booster doses in children, adolescents, adults and pregnant females. Many countries are giving at least 3 boosters between 1 year and the end of school. Often, these do not provide any protection or benefit to the recipient. In many instances, too many unnecessary booster doses are being administered, particularly for TT. Therefore, it was agreed that participants conduct a thorough review of schedules and real need for boosters in the Caribbean. The removal of unneeded boosters would result in savings that could be reallocated to the introduction of new antigens or strengthening of existing routine programs. When booster doses are needed, it is important to consider schedules that make it easier for parents to comply.

### Surveillance of Adverse Events

Thorough surveillance of vaccine-associated adverse events conducted during the recent mass MMR campaign in the Bahamas has provided reassuring results about the safety of the vaccine when used in older groups. These results may help other countries gain better acceptance of similar campaigns aimed at the elimination of CRS. Draft guidelines for implementing a surveillance system for adverse events following immunizations were developed and presented by PAHO. Participants noted that it was extremely encouraging to see that many Caribbean countries had already developed such surveillance systems.

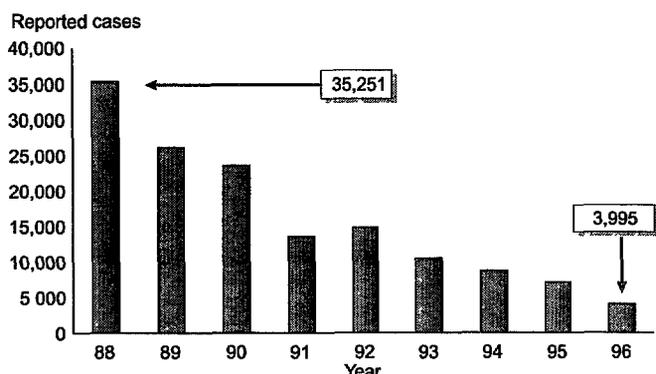
### Surveillance Priorities at CAREC

CAREC has redefined its communicable disease priorities, which will continue to include measles, polio, rubella/CRS, diphtheria, pertussis, tetanus and tuberculosis. In addition, CAREC will work with national EPIs to develop surveillance systems for other diseases that are becoming targets of national immunization programs, such as Hib and hepatitis B. CAREC will also continue fostering partnerships with the private sector to strengthen their participation and use of disease data, including the establishment of a private physician sentinel surveillance system.

# Polio Surveillance: Global Overview

As the year 2000 draws closer, the polio eradication initiative is gaining ground worldwide. More countries than ever before have begun to conduct surveillance for acute flaccid paralysis (AFP)—126 of 146 polio-endemic countries according to the World Health Organization (WHO). In 1996, there were a total of 3,995 confirmed polio cases, and as of 1 December 1997, 10,770 AFP cases were reported and 906 were confirmed as polio. The global AFP rate (per 100,000 children < 15 years of age) for the same period is 0.71, varying from 0.12 in the African Region to 1.22 in the Western Pacific.

**Figure 1**  
Global annual reported polio cases  
1988-1996



Source: WHO/GPV/EPI

While there are no technical obstacles toward reaching the goal of polio eradication by the year 2000, major impediments include the mobilization of adequate resources and the lack of public knowledge and support. Approximately 80% of the total cost of eradication is being paid by endemic countries, yet there is an estimated need for US\$ 600 million from collaborating countries and organizations to accomplish this goal.

**Table 1**  
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 $\geq$ 1/100,000 in children <15 years
Chile				
Colombia				
Cuba				
Ecuador				
El Salvador				
Honduras				
Nicaragua				
Venezuela				
Bolivia				
Dominican Republic				
Guatemala				
Mexico				
Paraguay				
Peru				
Brazil				
Panama				
Argentina				
Costa Rica				
Uruguay				
Haiti				

Meet criteria

\* Data as of 6 December 1997

Source: SVI/PAHO (PESS)

In the Region of the Americas, although polio has been eradicated, constant guard must be maintained to prevent a possible importation of wild poliovirus from resulting in the spread of the disease. Of continued concern is the decline in compliance with indicators for AFP surveillance, as can be seen in the Table 1. The overall Regional AFP rate through epidemiological week 49 was 0.99—the lowest for this period since PAHO began to track this number in 1991. This indicator requires a minimum rate of 1/100,000 in children less than 15 years of age as a measurement of the sensitivity of AFP surveillance. PAHO once again urges that the maintenance of polio eradication be a priority in all countries of the Region until global eradication is achieved.

## 1998 Prices for Vaccines Purchased through the EPI Revolving Fund

Vaccine	Number of doses per vial	Prices per dose FOBUS\$
BCG	10	0.0948
	20	0.045
DPT	10	0.0647
	20	0.0495
DT (adult)	10	0.0493
	20	0.0370
DT (pediatric)	10	0.0495
	20	0.0385
Measles	1	0.6000
	10	0.1022
MMR	1	0.82
	10	0.4895
Polio (glass vial)	10	0.0800
	20	0.0710
Polio (plastic)	10	0.0765
	20	0.066
TT	10	0.0350
	20	0.0235
<i>Haemophilus influenzae</i> type b w/pre-filled syringe	1	3.35*
Hepatitis B recombinant (20 mcg)	10	0.82

\*Not under EPI 1998 contract

**Editorial Note:** The table above indicates vaccine prices that members of the PAHO/EPI Revolving Fund will pay for 1998. The Fund provides participating countries with a reimbursement mechanism for the purchase of vaccines, syringes/needles, and cold chain equipment. Orders are consolidated on an annual basis on behalf of Member States and placed for international bidding. As can be seen in table above, the price of hepatitis B is US\$ 0.82, the lowest price ever for this vaccine! The Fund will continue playing a critical role in ensuring that a wide sector of the population enjoys the benefits of vaccination and that new vaccines can be added to the regular EPI schedule.

# Reported Cases of Selected Diseases

Number of reported cases of measles, poliomyelitis, tetanus, diphtheria, and whooping cough, from 1 January 1997 to date of last report, and the same epidemiological period in 1996, by country

Country/Territory	Date of last report	Measles			Confirmed* 1996	Polio		Tetanus				Diphtheria		Whooping Cough	
		Labo- ratory	Clini- cally	Total 1997		1997	1996	Non Neonatal		Neonatal		1997	1996	1997	1996
								1997	1996	1997	1996				
Anguilla	6 Dec	0	0	0	0	0	0								
Antigua & Barbuda	6 Dec	0	0	0	0	0	0	0		0		0		0	
Argentina	6 Dec	48	10	58	38	0	0	18	33	3	4	0	1	321	433
Bahamas	6 Dec	1	0	1	0	0	0	0	0	0	0	0	0	0	0
Barbados	6 Dec	0	0	0	0	0	0	0		0	0	0		0	
Belize	6 Dec	0	0	0	0	0	0	2	0	1	0	0	0	0	0
Bermuda	6 Dec	0	0	0	0	0	0	0				0		0	
Bolivia	6 Dec	1	0	1	4	0	0	2	4	7	6	1	1	77	11
Brazil	6 Dec	25,495	405	25,900	209	0	0	304	708	45	64	150	137	548	1,055
British Virgin Islands	6 Dec	0	0	0	0	0	0	0		0		0		0	
Canada	6 Dec	577	—	577	320	0	0		1						1,112
Cayman Islands	6 Dec	0	0	0	0	0	0	0		0		0		0	
Chile	6 Dec	47	0	47	0	0	0	4	10	0	2	0	1	825	766
Colombia	6 Dec	5	5	10	42	0	0	18	85	17	22	2	40	15	12
Costa Rica	6 Dec	11	3	14	7	0	0	2		0				10	
Cuba	6 Dec	0	0	0	0	0	0	0	3	0	0	0	0	0	0
Dominica	6 Dec	0	0	0	0	0	0	0		0	0	0		0	
Dominican Republic	6 Dec	1	0	1	0	0	0	17	21	0	0	4	6	1	2
Ecuador	6 Dec	0	0	0	30	0	0	42	89	19	32	17	15	148	67
El Salvador	6 Dec	0	0	0	1	0	0	3		2		0		2	
French Guiana	22 Mar	0	0	0		0	0								
Grenada	6 Dec	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Guadeloupe	6 Dec	116	0	116	1	0	0								
Guatemala	6 Dec	2	0	2	0	0	0	5	2	6	10	0	0	92	24
Guyana	6 Dec	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Haiti	22 Mar	0	0	0		0	0								
Honduras	6 Dec	1	5	6	3	0	0	5	9	1	4	0	0	121	134
Jamaica	6 Dec	0	0	0	0	0	0	2		0		1		4	
Martinique	22 Mar	0	0	0		0	0								
Mexico	6 Dec	0	8	8	84	0	0	142	165	39	64	0	0	199	32
Montserrat	6 Dec	0	0	0	0	0	0	0				0		0	
Netherlands Antilles	22 Mar	0	0	0		0	0								
Nicaragua	6 Dec	0	0	0	0	0	0	10	10	0	1	0	0	41	6
Panama	6 Dec	0	0	0	0	0	0	1	2	1	0	0	0	84	0
Paraguay	6 Dec	124	0	124	5	0	0	24	23	11	8	0	0	24	13
Peru	6 Dec	0	1	1	65	0	0	42	44	26	36	1	4	608	203
Puerto Rico	6 Dec	0	—	0	7	0	0								
St Vincent/Grenadines	6 Dec	0	0	0	0	0	0	0		0		0		0	
St Kitts/Nevis	6 Dec	0	0	0	0	0	0	0		0		0		0	
St Lucia	6 Dec	0	0	0	0	0	0	0		0		0		0	
Suriname	6 Dec	0	0	0	0	0	0	2	4	0	1	0	0	0	2
Trinidad & Tobago	6 Dec	1	0	1	0	0	0	2	15	0	0	1	0	7	56
Turks & Caicos	6 Dec	0	0	0	0	0	0	1		0		0		0	
United States	6 Dec	127	—	127	466	0	0								481
Uruguay	6 Dec	0	0	0	0	0	0	0	1	0	0	0	0	10	15
Venezuela	6 Dec	3	15	18	35	0	0	18		6	5	0	0	393	135
<b>TOTAL</b>		<b>26,560</b>	<b>452</b>	<b>27,012</b>	<b>1,317</b>	<b>0</b>	<b>0</b>	<b>666</b>	<b>1,229</b>	<b>184</b>	<b>259</b>	<b>177</b>	<b>205</b>	<b>3,530</b>	<b>4,559</b>

Data not available

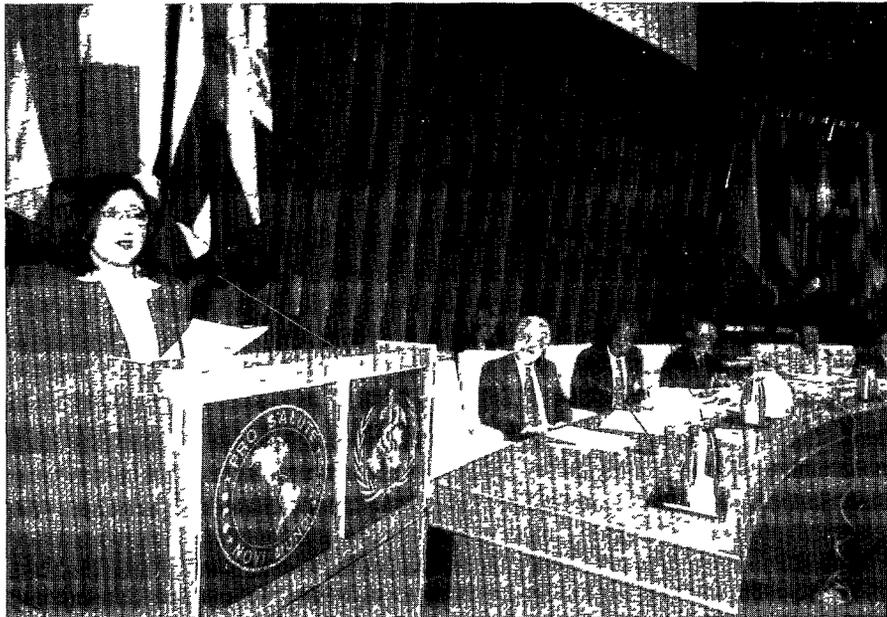
—Clinically confirmed cases are not reported

\* Laboratory and clinically confirmed cases

# 1997 PAHO Award for Immunization

Dr Rosario Quiroga, EPI Program Manager from Bolivia, became the third recipient of the PAHO Immunization Award, which recognizes outstanding contributions to a national immunization program and to a country's efforts in controlling and/or eliminating vaccine-preventable diseases. The award includes a certificate and US\$ 2,000. Previous recipients were Ms Clarice Watson, EPI Nurse Coordinator in Guyana, and Ms Miriam Strul, EPI Manager for Peru.

The PAHO Award for Immunization was established in 1993, following the receipt of the Prince Mahidol Award by Dr. Ciro de Quadros, Director of PAHO's Special Program for Vaccines and Immunization, for his contribution to the 1991 eradication of poliomyelitis in the Western Hemisphere. A portion of the monetary component of the Prince Mahidol Award was matched with funds from PAHO to establish an annual Immunization Award. Dr. Quiroga was selected by a Committee which is generally integrated by the members of PAHO's Technical Advisory Group on Vaccine-Preventable Diseases (TAG).



Dr. Rosario Quiroga addresses the XL Meeting of PAHO's Directing Council in September, upon receiving her award for outstanding contribution.

Dr. Quiroga is a medical doctor with post-graduate studies in the area of maternal and child health. After extensive field work, Dr. Quiroga joined Bolivia's EPI in 1987 in charge of cold chain operations and was promoted to EPI Manager in 1990. Under her leadership the national immunization program in Bolivia has seen marked improvements, particularly in the development of information systems at the local level and in fostering active community participation for immunization activities. Dr. Quiroga has also been successful in mobilizing the support of several agencies and organizations for the EPI.

Immunization coverage in Bolivia is now at its highest level, from an average of 48% for BCG, DPT, OPV and measles vaccines in 1990, to an average of 90% for the same

vaccines in 1996. Missed opportunities to vaccinate have virtually been eliminated. The country has also notably increased its national contribution for the procurement of biologicals, and there has been an increase in national resources toward the areas of cold chain and social mobilization.

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.

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.

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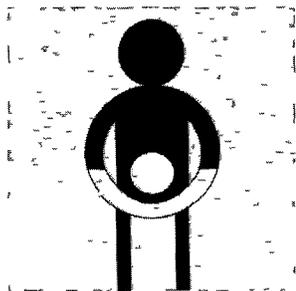
ISSN 0251-4729



**Pan American Health Organization**  
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World Health Organization

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<http://www.paho.org/english/svihome.htm>

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# EPI Newsletter

## Expanded Program on Immunization in the Americas

Volume XX, Number 1

IMMUNIZE AND PROTECT YOUR CHILDREN

February 1998

### Pertussis Outbreaks in the Americas

In 1997-1998, several outbreaks of pertussis have been reported in the Region. The following article summarizes preliminary information on the outbreaks occurring in Guatemala and Brazil.

#### Guatemala

An outbreak of pertussis is affecting the Department of Quiché in Guatemala since November of 1997. The outbreak started in Ilom, a community inhabited primarily by indigenous populations that live in geographical isolation. Vaccination coverage in these communities is estimated to be approximately 13%. The village of Ilom has a health post attended by a health worker.

Two months elapsed between the occurrence of the first cases and deaths and the actual notification to health authorities. By that time, 324 cases had been reported. The outbreak affected over 10% of the population living in the village. Of the total reported cases, 17 persons died (case fatality rate = 5.2%). Highest age-specific incidence rates (48.9%) and case-fatality rates (9.4%) were observed in the population 0-5 years of age. *Bordetella pertussis* was isolated in a nasopharyngeal sample from a four-year-old child and serology was also positive in four blood samples from the outbreak.

During the second week of January of 1998, more cases occurred affecting several neighboring communities (they share the road to the market). As of the end of January, there were an additional 269 cases reported, predominantly among children 5 to 9 years of age, who accounted for approximately 50% of the cases.

Contributing factors to the outbreak include a large number of susceptibles due to low vaccination coverage and the prolonged absence of *B. pertussis* circulation in an isolated community with relatively low population mobility. This area was also hard-hit by the long armed conflict in Guatemala, which ended in December of 1996. Factors contributing to the high case-fatality rate observed in Ilom include malnutrition, especially among children under 5, poor hygiene and crowded conditions.

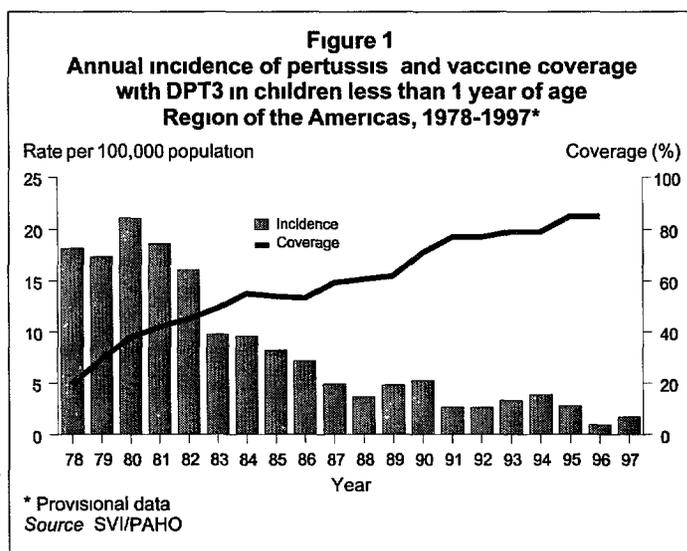
Different control measures were put into place during the outbreak. There was a change in the vaccination schedule for DPT. The first of 3 doses was moved forward from 2 months to 1 month, and intervals between vaccination were moved from 2 months to every 4 weeks. Following the initiation of the outbreak, vaccination with DPT was performed house-to-house in all communities. As the outbreak developed and because of the control measures, it was observed

that there were reduced number of cases among infants and young children. All cases and contacts have been treated with the appropriate antibiotics.

Source: Ministry of Health, Guatemala

#### Brazil

Starting at the end of October 1997, several cases of pertussis were reported among indigenous communities in the state of Acre. These territories are near the Peruvian border and there is frequent contact between the indigenous populations on both sides. During December, a group of vaccinators coordinated by the Ministry of Health visited the



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Upper Enviera River area in the municipality of Feijo, to investigate the outbreak and vaccinate children under 7 years of age with DPT vaccine. This opportunity was also used to vaccinate people with other antigens. The total population living in the area is approximately 2,500.

Since a non-governmental organization left the area at the end of 1995, vaccination coverage with three doses of DPT has fallen from 73% in 1995 to 16% in 1996, and 9% in 1997. A total of 98 pertussis cases were clinically-confirmed by the physician who accompanied the investigation team. The paroxysmal cough, cyanosis, and post-tussive vomiting were some of the pertussis symptoms found in the children. Information was collected for 91 (93%) of the cases: 17 (19%) occurred in children under 1 year, 40 (44%) in children 1-4 years, 22 (24%) in children 10-14 years, and 6 (7%) in persons over 15 years of age. Age was not known in 2 cases. Forty-three (47%) cases had unknown vaccination status, 42 (46%) were unvaccinated, and 2 (2%) occurred in persons who had completed their DPT vaccination schedule. Four (4%) cases occurred in persons who had been partially vaccinated. Of the total cases reported, there were 9 deaths (case-fatality rate = 10%), all occurring in children under 2 years of age, six of whom were less than 1 year of age. The last 3 cases were reported in week 52 of 1997.

As part of the outbreak control activities in the Upper Enviera River, 91 children under 1 year of age were vaccinated with DPT, 52 of whom received their first dose. In addition, 455 children 1-6 years of age were vaccinated. The second and third doses of DPT will need to be applied, as well as vaccination of nearly 14,500 infants from other hard-to-reach indigenous populations in Acre.

In December, cases were notified in the Rio Purus area of the Santa Rosa municipality, also in the state of Acre. Preliminary data was obtained in only 3 of the 19 villages, which reported a total of approximately 100 cases with 5 deaths.

*Source:* GT Diphtheria and Pertussis, National Health Foundation, Ministry of Health, Brazil.

**Editorial note:** Pertussis is a highly transmissible bacteria (up to 90% in susceptible individuals), it affects all age groups and can be deadly. Deaths occur primarily in

children under 2 years of age, with those less than 12 months at highest risk. Unlike measles, maternal antibodies do not confer immunity to newborns, so infants are susceptible from birth.

Vaccination coverage with three doses of DPT vaccine has improved notably in the Region during the past 20 years—from 12% in 1978 to 86% in 1996. This has produced a steady decline in reported cases over the same period. In 1978, over 100,000 cases were reported, compared with 17,000 cases reported in 1996 (Figure 1).

There are, however, persistent problems with pertussis, including difficult diagnosis, poor surveillance, inadequate laboratory support and high underreporting of cases in adolescents and adults. Given its clinical presentation, pertussis may often be confused with other acute respiratory infections and pneumonias. One of the major difficulties in establishing pertussis surveillance is the variety of symptoms which can accompany the disease. Symptoms range from slight to fatal paroxysmal coughing and vomiting, and complications include pneumonia, encephalitis and nutritional impairment. The severity of the disease is also related to the age and vaccination status of the patient.

As mentioned above, in 1996, Regional coverage with DPT vaccine was 86%. National average was below 80% in only three countries—Brazil, Guatemala and Venezuela (75%, 73% and 57%, respectively). During the last meeting of the Technical Advisory Group on Vaccine-Preventable Diseases (TAG) held in Guatemala in 1997, countries were encouraged to strengthen surveillance activities, standardize case reporting and laboratory diagnosis, reinforce routine immunization to achieve and maintain DPT3 coverage above 90%, and to implement selective investigation on distribution by age and sex, case vaccination status, case-fatality and incidence rates, particularly during outbreaks.

These recent outbreaks in Brazil and Guatemala have occurred primarily among indigenous people living in remote areas. They were preventable and therefore, increased efforts are needed to provide all recommended EPI vaccines to the target populations throughout the Region, especially persons living in areas with poor access to health services.

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## Importation of Measles to Costa Rica

*From July through October of 1997, Costa Rica experienced a measles outbreak with a total of 12 laboratory-confirmed measles cases. Ten clinically-confirmed measles cases were reported for the entire year. The following article summarizes the findings of the team that investigated the outbreak.*

The measles elimination initiative was launched in Costa Rica in 1993, but only 75% vaccination coverage was achieved in children under 15 years of age during the attack phase (catch-up campaign). Since 1995, selective vaccination campaigns have been held annually, most recently in April 1997. The age for vaccination with measles-mumps-

rubella (MMR) vaccine was 12 months of age prior to 1991, 18 months of age from 1991-1994, and 15 months of age from 1994 onward. In 1992, a booster dose was implemented at the age of 7 years (first grade of school). The last measles epidemic occurred from 1990 to 1992, producing more than 8,000 cases and 56 deaths. The last confirmed case of measles corresponds to that time.

From January through June 1997, there had been 49 suspected measles cases reported. Of these, 38 were discarded, 10 were under investigation and one case was clinically confirmed.

## Investigation

The first laboratory-confirmed measles case (index case), was a 27 year-old from the county of Liberia in the Northwest province of Guanacaste, who worked as a cook at a restaurant on the El Tamarindo beach, a tourist complex located approximately 60 km from Liberia with at least 60 hotels. The case had rash onset on 22 July 1997, accompanied by conjunctivitis and poor general condition. On 25 July, the patient developed a generalized maculopapular rash, and was admitted to Liberia Hospital for three days. A specimen from the patient tested positive for measles at the national laboratory (INCIENSA). The result was confirmed by the Measles Reference Laboratory of the Gorgas Center in Panama.

Twenty days prior to the illness, the patient had moved from Liberia to El Tamarindo beach to work in a restaurant. The patient was living in Santa Rosa, approximately 10 km from El Tamarindo, with a population of approximately 1,000. As cook, he did not have much contact with the restaurant's clients. Community investigation did not show any suspected measles cases in Santa Rosa. The patient does not remember being vaccinated against measles.

The second documented case, a woman 33 years of age, had rash onset on 11 August, and was hospitalized for five days. On 21 August, a third case was reported in a 12 month old child from Cuajmiquil in La Cruz county, who was hospitalized that same day in Liberia Hospital. The mother revealed that her child had been previously hospitalized on 8-9 August, with asthmatic bronchitis. There were two additional cases in Cuajmiquil, in children 13 and 14 months of age, who had direct contact with this patient.

On 9 September, two more cases were reported in Liberia. One, a girl of 7 months, was hospitalized from 21 to 25 August, with viral meningitis in Liberia Hospital. Fever and rash began ten days after her discharge, on 2 September. The other case was a girl 6 months of age, for whom there was no determined source of infection. All cases in this series were confirmed by INCIENSA and the Gorgas Laboratory.

A detailed investigation took place from 4-8 October, 1997. An analysis of vaccination coverage showed that at least 3 of the 12 counties in the province of Guanacaste did not achieve the required coverage rates for measles (more than 90%) in children under 1 year of age in the last two years.

The epidemiological history of the index case indicates that he likely contracted the virus at El Tamarindo beach, a popular tourist attraction. Most visitors come from Europe, North America, Canada, South America, and some from Central America. The largest hotels register between 35,000 and 40,000 tourists per year.

All contacts of the index case at the restaurant were interviewed without result. Next, selected hotels were visited. The manager of one said that in early July, three Brazilian tourists were lodged, one of which presented fever upon arrival and subsequently rash appeared. A physician diagnosed measles but did not report the case. The three

guests left the hotel around 19 August 1997. This hotel is less than 100 meters from the restaurant where the index case worked, and it is probable that the tourists went to eat in that restaurant. Two other suspected measles cases were found during the active search.

PAHO contacted the Ministry of Health in Brazil to investigate the suspected measles case from this Brazilian tourist. The case was confirmed as measles and it was also determined that the case was from the Sao Paulo area.

An analysis was carried out of all patients that entered the Hospital of Liberia from mid-July through the end of September, to determine whether these patients had disseminated the virus to other regions of the country upon leaving the hospital. It was found that patients from all 12 counties of the Guanacaste province had been hospitalized, as well as people from five other counties of the country, including San José, and two patients from Nicaragua.

## Control Measures

Selective vaccination was carried out in the county of Liberia targeting the entire population under 15 years of age. A national vaccination campaign against measles was implemented on 20 October 1997.

All countries in the Region of the Americas were alerted, particularly those in Central America, of the high risk of importations, especially in areas with low vaccination coverage.

## Conclusions

Measles virus circulated in the province of Guanacaste from July to October 1997. The first case was presented in an adult of 27 years, hospitalized on 25 July in the hospital of Liberia. Eleven more cases were confirmed, the last in October. No other cases have been confirmed either in the Guanacaste province or in the rest of the country. Almost all the cases in the first generation in the counties of Liberia and La Cruz had contact with the Liberia Hospital as source of infection and were linked to the index case. This suggests that transmission took place within Liberia Hospital.

As recommended by the XII Technical Advisory Group on Vaccine-Preventable Diseases (TAG) in Guatemala, it is necessary to monitor vaccination coverage by district and to characterize districts at high-risk for measles (coverage less than 90%). Viral isolation is required from all chains of transmission. An adequate sample of urine should be taken in sterile container at first contact (preferably within one week of rash onset) with suspected measles cases.

Source: Ministry of Health, Costa Rica

Visit the new **Measles News** section on the World Wide Web page of the Special Program for Vaccines and Immunization at <http://www.paho.org/english/svihome.htm>. This section contains up-to-date information on the Regional measles initiative, including the latest news, figures and graphs.

# Measles Vaccination Campaigns

Region	Country/Territory	Campaign 1-14 (Catch-up)		Average routine coverage 1994-1996 (Keep-up)	Campaign 1-4 (Follow-up)		Next Follow-up Due
		Year	Coverage (%)		Year	Coverage (%)	
Andean	Bolivia	1994	98	90			1998
	Colombia	1993	96	93	1995	90	1999
	Ecuador	1994	100	70			1998
	Peru	1992	75	87	1995	97	1999
	Venezuela	1994	100	75			1998
Brazil	Brazil	1992	96	80	1995	77	1999
Central America	Belize	1993	82	82	1995	85	1999
	Costa Rica	1993	75	90	-	-	1998*
	El Salvador	1993	96	89	1996	82	2000
	Guatemala	1993	85	73	1996	60	2000
	Honduras	1993	96	91	1996	85	2000
	Nicaragua	1993	94	81	1996	97	2000
	Panama	1993	88	86	1996	94	2000
English-speaking Caribbean and Suriname	Anguilla	1991	99	97	1996	100	2000
	Antigua & Barbuda	1991	96	95	1996	92	2000
	Bahamas	1991	87	91	1997	78	2001
	Barbados	1991	96	98	1996	91	2000
	British Virgin Islands	1991	88	100	1996	90	2000
	Cayman Islands	1991	85	92	-	-	-
	Dominica	1991	95	95	1996	100	2000
	Grenada	1991	98	89	1996	81	2000
	Guyana	1991	94	84	1996	90	2000
	Jamaica	1991	71	87	1995/6	85	1999
	Montserrat	1991	100	100	1996	100	2000
	St Kitts & Nevis	1991	98	100	1996	100	2000
	St Lucia	1991	97	94	1996	85	2000
	St Vincent & Grenadines	1991	97	100	1995	84	1999
	Suriname	1991	89	75	1997		
Trinidad & Tobago	1991	90	88	1997	96	2001	
Turks & Caicos	1991	81	98	1996	95	2000	
Latin Caribbean	Cuba	1987	98	100	1993	99	1998*
	Dominican Republic	1993	77	84			1998*
	Haiti	1994	94	28			1998*
Mexico	Mexico	1993	88	91			1998*
Southern Cone	Argentina	1993	97	98			1998*
	Chile	1992	99	94	1996	100	2000
	Paraguay	1995	70	78			1999
	Uruguay	1994	95	88			1998

Data not available - No campaign \* Overdue  
Data as of 21 January, 1998

*Follow-up* vaccination campaigns are an essential component of PAHO's measles eradication strategy. A *follow-up* campaign is defined as a periodic measles vaccination campaign which targets all children 1 to 4 years of age, regardless of prior vaccination status or disease history.

However efficient the *catch-up* (vaccination campaign aimed at all children 1-14 years of age) and *keep-up* (vaccination through routine services) vaccination efforts are, there will inevitably be an accumulation of measles susceptible preschool-aged children over time. The primary purpose of *follow-up* campaigns is to prevent this accumulation of susceptible children from reaching dangerous levels which can increase the risk of a measles outbreak.

Two factors contribute to the build-up of susceptible children. *First*, measles vaccine is less than 100% effective, thus leaving some children unprotected following vaccination. *Second*, measles vaccination coverage for each birth cohort will almost always fall short of reaching all children.

PAHO's measles eradication strategy recommends that periodic *follow-up* vaccination campaigns be conducted whenever the estimated number of measles susceptible preschool-aged children (children 1-4 years of age) approaches the size of an average birth-cohort. The interval between campaigns will depend upon the vaccination coverage obtained among infants through routine services since

the last campaign. The lower the average routine vaccination coverage, the shorter the interval between campaigns. For example, if an average of only 60% routine coverage is obtained, a *follow-up* vaccination campaign would be needed approximately every two years, if 80% average coverage is obtained, then campaigns will be needed approximately every four years. The maximum allowable interval between campaigns is 4 years. Most countries of the Americas are able to maintain an average routine coverage of at least 80% and conduct *follow-up* campaigns every 4 years.

The table on page 4 summarizes available data concerning measles vaccination activities by country. At this point there are several countries which are overdue for *follow-up* campaigns or are due for campaigns in 1998. The following countries **overdue** for a campaign are at relatively increased risk for measles outbreaks and should conduct *follow-up* campaigns as soon as possible: **Argentina, Costa Rica, Cuba, Dominican Republic, Haiti, and Mexico**. The following countries are due to conduct *follow-up* campaigns in 1998: Bolivia, Ecuador, Venezuela and Uruguay.

## Update: Sao Paulo Measles Outbreak

*This article updates the information published in the June 1997 edition of the EPI Newsletter*

During 1997 and through 20 January 1998, a provisional total of 26,722 confirmed measles cases was reported from the countries of the Americas. Of these, 25,599 (96%) were reported from Brazil. Of the Brazil cases, 20,459 (80%) occurred in the state of Sao Paulo. The outbreak began during late 1996 with a total of 27 confirmed cases. During 1997, cases were reported from over 250 of the state's 645 municipalities. Of the total cases, 18,542 (91%) were reported from the Greater Sao Paulo metropolitan area.

The age-groups most affected by the Sao Paulo outbreak were infants under 1 year of age, (440 cases/100,000 population), followed by young adults 20-29 years, (164 cases/100,000), children 1-4 years (47 cases/100,000) and children 5-9 years (32 cases/100,000).

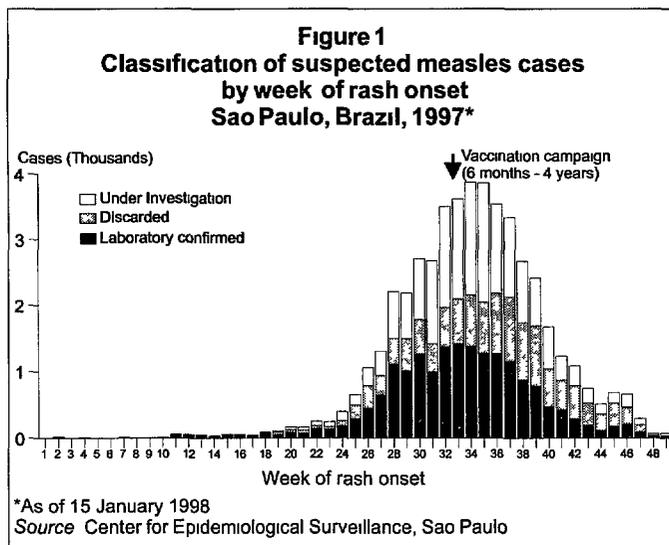
As of 20 January, a total of 20 measles deaths were reported (1 death per 1,022 reported cases, total case-fatality rate of 0.10%), 17 (85%) were residents of the Greater Sao Paulo metropolitan area.

The age distribution of persons dying of measles is as follows: 11 (55%) were infants less than one year of age, 3 (15%) were children 1-4 years of age, 2 (10%) were children 5-9 years of age, and 4 (20%) were young adults 20-29 years of age. The following age-specific case-fatality rates were observed: in infants < 1 year of age (0.38%), children 1-4 years of age (0.25%), children 5-9 years of age (0.20%) and young adults 20-29 years of age (0.04%).

The following strategies were implemented with the goal of reducing measles virus circulation:

- Lowering the age of routine measles vaccination from 9 months to 6 months

- Selective vaccination of unvaccinated children under 5 years of age in June 1997 (161,987 doses administered)
- Vaccination of health workers (182,562 doses administered)
- Extended contact vaccination of persons under 30 years of age, to reach those possibly exposed to cases of measles, including households, neighborhoods, workplace, schools and other high-risk groups (856,534 doses administered)



- Indiscriminate vaccination of children 6 months through 4 years 11 months of age in August 1997 (3,085,221 doses administered). Coverage is estimated to be 100% using official population data
- Selective vaccination of school-aged children between 5-15 years of age between September and November 1997 (298,039 doses administered)
- Intensification of routine vaccination against measles for children between the ages of 9 and 15 months of age

These interventions appeared to have been effective in slowing the epidemic. From week 36 on (two weeks after the indiscriminate vaccination campaign) there was a sharp drop in the number of cases (Figure 1). In addition to this drop, there was a marked reduction in the proportion of suspected measles cases that were confirmed by laboratory testing. Prior to the campaign (weeks 24 to 33), 67% of suspected measles cases were confirmed by laboratory, and following the campaign (weeks 36 to 45) only 43% were confirmed.

The Center for Epidemiological Surveillance of the Sao Paulo State Health Secretariat, in collaboration with the National Health Foundation of the Ministry of Health and the State Promotion for Mass Immunization and Education (FESIMA), along with PAHO are conducting a detailed

study to determine the risk factors for acquiring measles in this outbreak. This study seeks to track the dynamic of measles virus transmission and other factors that may explain the occurrence of this epidemic.

*Source:* Center for Epidemiological Surveillance, Sao Paulo State Health Secretariat, Brazil

**Editorial Note** Although the outbreak investigation is continuing, the Sao Paulo experience clearly demonstrates both the infectiousness and lethality of measles virus. Following a prolonged period of low measles incidence, the virus returned with a vengeance in Sao Paulo State. Measles has demonstrated its ability to find susceptible persons, even in areas with high vaccination coverage.

Several factors appear to have combined to create conditions which facilitated measles transmission in Sao Paulo. First, the failure to conduct a *follow-up* vaccination campaign in 1995, combined with low routine vaccination coverage (*keep-up* vaccination) among infants allowed for the accumulation of susceptible children in Sao Paulo. Second, the presence of large numbers of susceptible young adults who, for a variety of reasons, escaped both natural measles infection and measles vaccination increased the risk of a measles outbreak. Third, measles virus was imported into Sao Paulo, most probably from Europe. Finally, the high population density of the city facilitated contact between persons infected with measles and susceptible persons.

Available surveillance data suggest that the major outbreak control activities implemented in Sao Paulo helped to reduce the number of susceptibles and slow the epidemic.

However, these control measures were very expensive in terms of financial and human resources, not to mention the opportunity cost of the interventions. Over 4.5 million persons were vaccinated in these efforts. Combined with the direct costs associated with medical care and the indirect costs due to decreased productivity, both acutely and chronically, this outbreak was very costly.

The overriding objective of PAHO's measles eradication strategy is the prevention of measles outbreaks. It is far better (and cheaper) to prevent an outbreak than to be forced to attempt to control an outbreak. Measles outbreaks can be prevented by achieving and maintaining high population immunity in susceptible populations, combined with the absence of imported measles virus.

Sao Paulo will now need to redouble its efforts to prevent future measles outbreaks. High coverage levels of measles vaccination must be achieved and maintained for infants at their first birthday. *Follow-up* campaigns must be conducted every four years to assure the highest possible level of measles population immunity. A two-dose schedule is clearly not an appropriate measles eradication strategy unless nearly universal coverage can be assured in a timely manner for **both** doses of measles vaccine. Moreover, efforts need to be made to assure immunity in adolescents and young adults who are at highest risk for exposure to measles virus. These interventions, combined with the reduction of measles importations from other regions of the world, will greatly decrease the risk of another major measles outbreak in Sao Paulo or elsewhere in the Americas.

## Polio Surveillance

In 1998, the Region of the Americas will complete its seventh year since the last case of poliomyelitis was detected, and the fourth year since polio was declared eradicated in the Western Hemisphere by the International Commission for the Certification of Poliomyelitis Eradication. Still in front of us, however, is the projected worldwide eradication of polio by the year 2000. While polio circulates in other regions of the world, the Americas must remain alert in the surveillance for cases of acute flaccid paralysis (AFP).

The table at right compares countries' fulfillment of AFP surveillance criteria in 1994, the year polio was declared eradicated, and in 1997. For the most part, countries have been consistent in maintaining AFP surveillance. However, the indicator measuring AFP rate per 100,000 has declined sharply. This is an indication that fewer AFP cases are being detected and entered into the surveillance system, which subsequently impacts the other surveillance criteria.

AFP Surveillance Indicators, 1994 and 1997\*

Country	80% weekly reporting units		80% of cases investigated within 48 hours		80% of cases with 1 adequate stool sample taken		AFP Rate $\geq$ 1/100 000 in children < 15 years	
	1994	1997	1994	1997	1994	1997	1994	1997
Argentina	■	■	■	■	■	■	■	■
Bolivia	■	■	■	■	■	■	■	■
Brazil	■	■	■	■	■	■	■	■
Chile	■	■	■	■	■	■	■	■
Colombia	■	■	■	■	■	■	■	■
Costa Rica	■	■	■	■	■	■	■	■
Cuba	■	■	■	■	■	■	■	■
Dominican Republic	■	■	■	■	■	■	■	■
Ecuador	■	■	■	■	■	■	■	■
El Salvador	■	■	■	■	■	■	■	■
Guatemala	■	■	■	■	■	■	■	■
Haiti	■	■	■	■	■	■	■	■
Honduras	■	■	■	■	■	■	■	■
Mexico	■	■	■	■	■	■	■	■
Nicaragua	■	■	■	■	■	■	■	■
Panama	■	■	■	■	■	■	■	■
Paraguay	■	■	■	■	■	■	■	■
Peru	■	■	■	■	■	■	■	■
Uruguay	■	■	■	■	■	■	■	■
Venezuela	■	■	■	■	■	■	■	■
Total Countries	18	17	18	17	11	12	18	12

■ Meet criteria in 1997      ■ Meet criteria in 1994  
 \* Data as of 3 January 1998 (Week 53)      Source: SVI/PAHO (PESS)

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# Reported Cases of Selected Diseases

Number of reported cases of measles, poliomyelitis, tetanus, diphtheria, and whooping cough, from 1 January 1997 to date of last report, and the same epidemiological period in 1996, by country

Country/Territory	Date of last report	Measles				Polio		Tetanus				Diphtheria		Whooping Cough	
		Confirmed 1997			Confirmed* 1996	1997	1996	Non Neonatal		Neonatal		1997	1996	1997	1996
		Labo-ratory	Clini-cally	Total				1997	1996	1997	1996				
Anguilla	3 Jan	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Antigua & Barbuda	3 Jan	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Argentina	3 Jan	48	10	58	59	0	0	18	41	3	4	0	0	321	767
Bahamas	3 Jan	1	0	1	0	0	0	0	1	0	0	0	0	0	0
Barbados	3 Jan	0	0	0	0	0	0	0	1	0	0	0	0	0	0
Belize	3 Jan	0	0	0	0	0	0	1	3	0	0	0	0	0	1
Bermuda	3 Jan	0	0	0	0	0	0	0	0	0	0	0	0	3	0
Bolivia	3 Jan	1	0	1	7	0	0	4	4	8	14	3	1	125	43
Brazil	3 Jan	25,145	454	25,599	580	0	0	304	815	45	83	160	181	546	1,245
British Virgin Islands	3 Jan	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Canada	3 Jan	580	—	580	327	0	0	3	2			1		2,914	4,809
Cayman Islands	3 Jan	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Chile	3 Jan	54	0	54	0	0	0	4	17	0	0	0	1	825	1,094
Colombia	3 Jan	5	5	10	160	0	0	21	7	24	26	2	40	425	111
Costa Rica	3 Jan	12	3	15	24	0	0	3	3	0	0	0	0	30	20
Cuba	3 Jan	0	0	0	0	0	0	0	3	0	0	0	0	0	0
Dominica	3 Jan	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dominican Republic	3 Jan	1	0	1	0	0	0	14	17	0	0	25	6	1	2
Ecuador	3 Jan	0	0	0	42	0	0	39	88	25	36	19	22	245	163
El Salvador	3 Jan	0	0	0	1	0	0	3	10	2	5	0	0	2	3
French Guiana		0	0	0		0	0								
Grenada	3 Jan	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Guadeloupe	3 Jan	116	0	116	13	0	0								
Guatemala	3 Jan	2	0	2	1	0	0	5	2	6	12	0	0	92	66
Guyana	3 Jan	0	0	0	0	0	0	0	2	0	0	0	0	0	44
Haiti	26 Jul	0	0	0	1	0	0	0		33		0		0	
Honduras	3 Jan	1	5	6	4	0	0	10	20	1	4	0	0	160	200
Jamaica	3 Jan	0	0	0	4	0	0	6	13	0	0	0	0	4	22
Martinique		0	0	0		0	0								
Mexico	3 Jan	0	0	0	180	0	0	163	229	41	64	0	0	206	32
Montserrat	3 Jan	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Netherlands Antilles		0	0	0		0	0								
Nicaragua	3 Jan	0	0	0	0	0	0	13	9	1	1	0	0	330	14
Panama	3 Jan	0	0	0	0	0	0	1	3	1	0	0	0	103	44
Paraguay	3 Jan	124	0	124	13	0	0	28	16	15	10	0	0	27	40
Peru	3 Jan	0	1	1	105	0	0	63	57	35	46	2	4	989	355
Puerto Rico	3 Jan	0	—	0	8	0	0								
St Vincent/Grenadines	3 Jan	0	0	0	0	0	0	0	0	0	0	0	0	0	0
St Kitts/Nevis	3 Jan	0	0	0	0	0	0	0	1	0	0	0	0	0	0
St Lucia	3 Jan	0	0	0	0	0	0	1	0	0	0	0	0	0	0
Suriname	3 Jan	0	0	0	0	0	0	0	4	0	0	0	0	0	2
Trinidad & Tobago	3 Jan	1	0	1	0	0	0	4	5	0	0	0	0	1	0
Turks & Caicos	3 Jan	0	0	0	0	0	0	0	0	0	0	0	0	0	0
United States	3 Jan	135	—	135	489	0	0	42				5	0	5,461	7,796
Uruguay	3 Jan	0	0	0	2	0	0	1	1	0	0	0	0	12	17
Venezuela	3 Jan	3	15	18	89	0	0	12	65	7	14	0	0	609	443
<b>TOTAL</b>		<b>26,229</b>	<b>493</b>	<b>26,722</b>	<b>2,109</b>	<b>0</b>	<b>0</b>	<b>763</b>	<b>1,439</b>	<b>247</b>	<b>319</b>	<b>217</b>	<b>255</b>	<b>13,432</b>	<b>17,333</b>

Data not available

—Clinically confirmed cases are not reported

\* Laboratory and clinically confirmed cases

# Vaccines of Quality

*This article is the first of a series summarizing quality control tests performed by manufacturers and National Control Authorities (NCA), to determine if a particular vaccine lot is of known quality. This article focuses on the various safety tests that can be performed and their role. Future articles will address the topics of safety tests used for specific vaccines, potency testing, and the importance of planning to maintain adequate vaccine stocks.*

The quality of a vaccine or vaccine lot is not only determined by the results of testing. Quality begins during the manufacturing process, as early as at the selection of the seed lot (bacterial or viral strain used to initiate the growth that will lead to the final product), culture media, reagents, and through the quality of the manufacturing process (adherence to Good Manufacturing Practices).

The NCA, through its National Control Laboratory, may decide not to perform all the tests, however, the manufacturer's protocol must be thoroughly evaluated to assure that testing has been performed.

Quality control of a vaccine consists of two main components: safety, and potency or efficacy of the vaccine. Safety evaluations ensure that the vaccine does not contain ingredients harmful to people or animal. These may include:

- the agent itself in the case of a toxin, or the bacterial or viral strain,
- chemicals added during the process intentionally that are not completely removed,
- the substrate used, such as culture medium, culture cells, eggs, serum or liquids,
- chemicals or agents added unintentionally.

Tests have been devised to address these different problems.

- a Specific-toxicity tests have been designed to detect residual toxicity (in the case of toxoids) or virulence (incomplete inactivation of vaccine strain)
- b An identity test can also be included among the safety tests, as it ensures that the antigen in the vaccine is the same as indicated in the label
- c Chemicals and substances are added to the vaccine during the production processes: anti-foaming agents, inactivating agents, solvents, chemical reagents and finally adjuvants and/or preservatives. The concentration of these agents is usually monitored by chemical reactions to ensure that the concentration is within accepted specifications
- d Other chemicals added unintentionally through contaminated equipment or reagents can be present and pass undetected. The abnormal toxicity test or innocuity test has been devised for this purpose
- e Substrates used for the fermentation processes or cell growth are a special risk factor. Animal components of culture media may be contaminated with microorganisms, or products thereof that are a serious threat to human health. Attention is thus being paid to detect microbial contamination through the sterility test
- f Microorganism contamination during the production process can be also monitored through the pyrogen test and/or the endotoxin test, which detect membrane components (lipopolysaccharides) of Gram negative bacteria

It is important to note that each of the tests mentioned above is used to evaluate a specific area of vaccine safety, and that these test results can only be interpreted within that context. One cannot demand more from a test than what it was developed to do.

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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.

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.

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ISSN 0251-4729



**Pan American Health Organization**  
Pan American Sanitary Bureau  
Regional Office of the  
World Health Organization

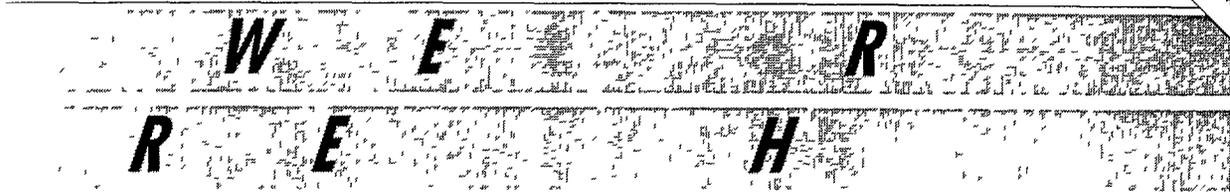
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**Annex 7**

*Weekly Epidemiological Record, 20 March 1998 (73<sup>rd</sup> Year, No 12, pp81-88)*

*Article: Progress towards elimination of measles in the Americas*



**Expanded Programme on Immunization (EPI)**

Progress towards elimination of measles in the Americas

In 1994, the countries in the WHO Region of the Americas established the goal of measles elimination by the year 2000. To achieve this goal, the Pan American Health Organization (PAHO) has developed a measles elimination strategy<sup>1</sup>.

The PAHO measles elimination strategy aims to achieve and maintain very high levels of measles immunity in infants and children, and detect all chains of transmission of measles virus through careful surveillance. The strategy includes 3 vaccination components. First, a one-time 'catch-up' measles vaccination is conducted with the aim to vaccinate all children 9 months through 14 years of age, regardless of measles disease history or vaccination status. Second, efforts are directed at strengthening infant immunization through routine vaccination services ("keep-up") in order to maintain the interruption of measles virus circulation. If high coverage is achieved and maintained, the risk of an infant being exposed to measles virus is low and the age at which routine measles vaccination is administered can be safely increased from 9 to 12 months, thus providing an increase in vaccine effectiveness. Efforts are made to achieve 90% coverage in each successive birth cohort. Third, periodic "follow-up" vaccination campaigns are conducted targeting all children 1 to 4 years of age. In fact, since measles vaccine is less than 100% effective and universal vaccination coverage is rarely achieved, there will be an accumulation of susceptible infants and children over time, increasing the risk of a measles outbreak should the virus be introduced. The interval between "follow-up" campaigns is determined by the vaccination coverage obtained through routine vaccination services, but in practice, should be conducted at least every 4 years.

<sup>1</sup> See No 16 1995 pp 113-115

**Programme élargi de vaccination (PEV)**

Progres réalisés vers l'élimination de la rougeole dans les Amériques

En 1994, les pays de la Région des Amériques se sont fixés pour but d'éliminer la rougeole d'ici l'an 2000. C'est à cette fin que l'Organisation panaméricaine de la Santé (OPS) a élaboré une stratégie d'élimination de la rougeole<sup>1</sup>.

Cette stratégie vise à obtenir et à maintenir un degré élevé d'immunité antirougeoleuse chez les nourrissons et les enfants et à rechercher toutes les voies de transmission du virus rougeoleux grâce à une surveillance attentive. Cette stratégie préconise des opérations de vaccination en 3 temps. Premièrement, on procédera à une vaccination de «rattrapage» en une fois visant à vacciner tous les enfants âgés de 9 mois à 14 ans, qu'ils aient eu ou non la rougeole et qu'ils aient été vaccinés ou non. Deuxièmement, on cherchera à renforcer l'immunisation des nourrissons à l'aide des services de vaccination de routine («mise à jour des vaccinations») de façon à interrompre définitivement la circulation du virus rougeoleux. Si l'on parvient à obtenir un fort taux de couverture vaccinale et à le maintenir, le risque pour un nourrisson d'être exposé au virus rougeoleux sera faible, et l'âge de la vaccination rougeoleuse pourra sans danger être porté de 9 à 12 mois, permettant ainsi d'augmenter l'efficacité du vaccin. Ainsi, on s'efforcera d'obtenir un taux de couverture vaccinale de 90% dans chacune des cohortes successives constituées d'après la date de naissance. Troisièmement, on mènera des campagnes de vaccination de «suivi» ciblées sur les enfants de 1 à 4 ans. En effet, l'efficacité du vaccin antirougeoleux n'atteint pas 100% et il est rare d'obtenir une couverture vaccinale totale – le nombre de nourrissons et d'enfants sensibles va donc s'accroître avec le temps, majorant le risque d'une flambée de rougeole en cas de réintroduction du virus. L'intervalle séparant chaque campagne de «suivi» est en fonction de la couverture vaccinale obtenue par les services habituels de vaccination, mais en pratique de 4 ans au maximum.

<sup>1</sup> Voir N° 16 1995 pp 113-115

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Surveillance is a critical component of PAHO's measles elimination strategy. Efforts have been made to improve measles surveillance throughout the Region, including the laboratory investigation of suspected measles cases. Health-care workers are requested to collect venous blood samples from suspected measles cases. Samples are tested for the presence of anti-measles IgM antibodies using a sensitive and specific enzyme immunoassay. To obtain more information concerning the molecular epidemiology of measles virus, attempts are made to collect appropriate specimens for virus isolation from every chain of transmission in the Region.

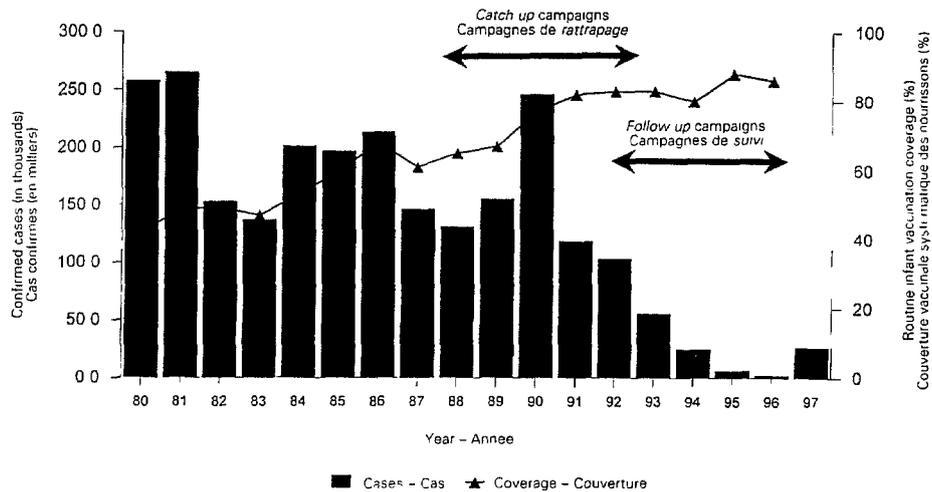
Every country in the Region, with the exception of the United States of America and several French and Dutch Caribbean territories, conducted some form of measles "catch-up" campaign between the years 1987 and 1994, the coverage achieved in these campaigns was 94% region-wide, and the range in country-specific coverage was 71% to 99%. In addition, there has been a progressive increase in routine measles vaccination coverage among infants from 42% in 1980 to 86% in 1996 (Fig 1). In 1996, 27 (57%) of 47 countries/areas achieved a coverage of at least 90% in their routine vaccination services and only 5 (11%) presented a coverage below 80%. Since 1994, 26 (55%) of the 47 countries/areas have also conducted follow-up vaccination campaigns.

La surveillance est un élément capital de la stratégie d'élimination de la rougeole de l'OPS. Dans toute la Région, les efforts ont été axés sur l'amélioration de la surveillance, notamment en instituant l'étude au laboratoire des cas présumés de rougeole. Il est demandé aux agents de soins de santé de prélever du sang veineux en pareil cas. On recherche dans ces prélèvements la présence d'IgM anti-rougeoleuses au moyen d'un dosage immunoenzymatique sensible et spécifique. Pour obtenir davantage d'informations sur l'épidémiologie moléculaire du virus rougeoleux, on essaie de recueillir des échantillons destinés à l'isolement du virus dans chaque chaîne de transmission de la Région.

Tous les pays de la Région, à l'exception des États-Unis d'Amérique et de plusieurs territoires français et néerlandais des Caraïbes, ont mené sous une forme ou sous une autre des campagnes de vaccination de «rattrapage» entre 1987 et 1994, la couverture atteinte pendant ces campagnes a été de 94% au niveau de la région, et se situait entre 71% et 99% selon les pays. De plus, la couverture vaccinale des nourrissons s'est progressivement accrue, passant de 42% en 1980 à 86% en 1996 (Fig 1). En 1996, sur 47 pays ou territoires de la Région, 27 (57%) ont atteint une couverture d'au moins 90% grâce aux services de vaccination de routine et seulement 5 (11%) avaient une couverture de moins de 80%. Depuis 1994, 26 des 47 pays ou territoires (55%) ont également mené des campagnes de vaccination de suivi.

Fig 1 Confirmed measles cases and vaccination coverage, Region of the Americas, 1980-1997

Fig 1 Nombre de cas de rougeole confirmés et couverture vaccinale, Région des Amériques, 1980-1997



\* Coverage for children 11-1 year of age - Couverture des enfants à l'âge d'un an

Following the implementation of the strategies outlined above, there has been a marked reduction in the annual number of reported measles cases in the Region (Fig 1). In 1996, the all-time record low of 2 109 confirmed measles cases was reported from the countries of the Americas. Of the 47 countries/areas which provide measles surveillance data to PAHO on a weekly basis, 29 (61%) reported zero confirmed measles cases and 38 (80%) reported 10 or fewer cases. Most of the Region was free of measles virus circulation during 1996.

In 1997, however, there was a resurgence of measles in the Region, especially in São Paulo State in Brazil. Provisional data received at PAHO through February 1998 indicate a total of 88 485 suspected measles cases reported

Suite à la mise en œuvre des stratégies décrites plus haut, on a observé un recul sensible du nombre annuel de cas de rougeole rapportés dans la Région (Fig 1). En 1996, le chiffre sans précédent de 2 109 cas confirmés de rougeole seulement a été rapporté pour les Amériques. Sur les 47 pays ou territoires qui transmettent chaque semaine des données sur la surveillance de la rougeole à l'OPS, 29 (61%) n'ont eu aucun cas confirmé de rougeole et 38 (80%) ont rapporté 10 cas ou moins. En 1996, la circulation du virus rougeoleux était interrompue dans la majeure partie de la Région.

Toutefois, 1997 a vu la résurgence de la maladie, en particulier dans l'État de São Paulo au Brésil. Les données provisoires dont disposait l'OPS jusqu'en février 1998 indiquent un total de 88 485 cas présumés de rougeole dans les Amériques, 27 635

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from the countries in the Americas. Of these, 27 635 (31%) have been confirmed, 33 120 (37%) have been discarded, and 27 730 (31%) remain under investigation.

Of the total confirmed cases, 26 919 (97%) were confirmed by laboratory testing or epidemiological linkage to a laboratory-confirmed case and 716 (3%) were confirmed on clinical grounds alone, without laboratory investigation. Together, Brazil (26 348 confirmed cases) and Canada (570 confirmed cases) accounted for 97% of the total confirmed cases in the Region. Other countries/areas reporting more than 10 confirmed measles cases during 1997 include the United States (135 cases), Paraguay (198 cases), Guadeloupe (116 cases), Argentina (96 cases), Chile (59 cases), Venezuela (27 cases), and Costa Rica (15 cases).

Of the total confirmed cases reported from Brazil, 20 186 (77%) were reported from São Paulo State – the only state in the country that did not conduct a “follow-up” measles vaccination campaign in 1995. Most cases in this outbreak occurred in persons living in the greater São Paulo metropolitan area. Of the 19 322 confirmed measles cases reported from São Paulo State whose ages were recorded, 9 938 (51%) occurred in persons 20–29 years of age. The highest age-specific incidence rates were reported in infants less than 1 year of age (456 cases per 100 000), young adults 20 to 29 years of age (156 cases per 100 000), and children 1–4 years of age (45 cases per 100 000). Many of the young adult cases occurred among persons who were members of certain risk groups congregating in enclosed environments including male migrant workers from rural areas, students, health-care workers, tourist-industry workers, and military recruits. Twenty measles-related deaths were reported, 17 (85%) occurred in infants less than 1 year of age.

Measles virus was isolated from several patients during this outbreak. Genomic sequencing of these virus isolates performed at the Measles Laboratory, Centers for Disease Control and Prevention (CDC), Atlanta, Georgia, United States demonstrated that the virus circulating in São Paulo is similar to virus isolates recently obtained from western Europe, suggesting that the virus responsible for the outbreak may have been imported from Europe. Measles virus spread from São Paulo to nearly every other state in Brazil. Other Brazilian states reporting large numbers of measles cases include Bahia (1 013 cases), Minas Gerais (626 cases), Ceara (594 cases), Rio de Janeiro (577 cases), Parana (462 cases), and the Federal District (432 cases). Spread from São Paulo to several other countries in the Region was documented, including Argentina, Chile, Costa Rica, Paraguay, Peru, and the United States.

A detailed epidemiological investigation is currently under way to determine specific risk factors for measles in São Paulo. Several factors, however, may have facilitated widespread measles transmission in the greater São Paulo metropolitan area. First, the lack of a timely “follow-up” vaccination campaign in 1995 for children aged 1 to 4 years, combined with low routine vaccination coverage among infants, allowed for a rapid accumulation of susceptible preschool-aged children in São Paulo. Second, the presence of large numbers of susceptible young adults who had escaped both natural measles infection and measles vaccination increased the risk of a measles outbreak. Third, measles virus was introduced into São Paulo most probably as a result of an importation from Europe. Finally, the high population density of the city greatly facilitated contact between persons infected with measles and those who were susceptible.

d entre eux (31%) ont été confirmés, 33 120 (37%) éliminés, et 27 730 (31%) sont encore à l'étude.

Sur l'ensemble des cas confirmés, 26 919 (97%) ont été confirmés par des tests de laboratoire ou par un lien épidémiologique avec un cas confirmé au laboratoire et 716 (3%) ne l'ont été que d'après les symptômes cliniques, sans analyse de laboratoire. Le Brésil (26 348 cas confirmés) et le Canada (570 cas confirmés) comptent à eux seuls 97% du nombre total de cas confirmés dans la Région. Parmi les autres pays ayant notifié plus de 10 cas confirmés de rougeole en 1997, on citera les États-Unis d'Amérique (135 cas), le Paraguay (198 cas), la Guadeloupe (116 cas), l'Argentine (96 cas), le Chili (59 cas), le Venezuela (27 cas) et le Costa Rica (15 cas).

Sur l'ensemble des cas confirmés notifiés par le Brésil, 20 186 (77%) l'ont été dans l'État de São Paulo, le seul État n'ayant pas mené une campagne de vaccination antirougeoleuse de «suivi» en 1995. Lors de cette flambée, la plupart des cas se sont déclarés chez des personnes vivant dans la zone métropolitaine du grand São Paulo. Sur les 19 322 cas confirmés notifiés dans l'État de São Paulo pour lesquels l'âge des patients était connu, 9 938 (51%) ont touché les 20–29 ans. Les taux d'incidence par âge les plus élevés ont été rapportés chez les nourrissons de moins d'un an (456 cas pour 100 000), les 20–29 ans (156 cas pour 100 000) et les enfants de 1 à 4 ans (45 cas pour 100 000). Chez les jeunes adultes, beaucoup de cas ont été recensés chez les personnes appartenant à certains groupes à risque vivant en collectivité, par exemple les travailleurs émigrés des régions rurales, les étudiants, les agents de soins de santé, les employés de l'industrie du tourisme, et les conscrits. On a rapporté 20 décès par rougeole, 17 (85%) sont survenus chez des enfants de moins d'un an.

Au cours de cette flambée, on a isolé le virus rougeoleux chez plusieurs patients. Le séquençage génomique de ces isoléments, effectué au Laboratoire de la rougeole, *Centers for Disease Control and Prevention* (CDC) d'Atlanta, Géorgie, États-Unis, a montré que le virus circulant à São Paulo était le même que celui qui a été retrouvé dans des isoléments récemment effectués en Europe occidentale, ce qui laisse à penser qu'il a peut-être été importé. Ce virus s'est propagé dans presque tous les autres États du Brésil. Parmi les États qui ont notifié un nombre important de cas de rougeole, on citera Bahia (1 013 cas), Minas Gerais (626 cas), Ceara (594 cas), Rio de Janeiro (577 cas), Parana (462 cas), et le District fédéral (432 cas). La dissémination à partir de São Paulo a été attestée dans plusieurs autres pays de la Région, notamment en Argentine, au Chili, au Costa Rica, aux États-Unis, au Paraguay et au Pérou.

On procède actuellement à une étude épidémiologique détaillée afin de déterminer quels ont été les facteurs de risque spécifiques de la rougeole à São Paulo. Plusieurs d'entre eux ont pu faciliter la dissémination de la maladie dans la zone métropolitaine du grand São Paulo. Premièrement, l'absence d'une campagne de vaccination de «suivi» en 1995 pour les enfants âgés de 1 à 4 ans, associée à une faible couverture vaccinale de routine chez les nourrissons, a permis l'accroissement rapide du nombre d'enfants d'âge préscolaire sensibles dans cette zone. Deuxièmement, la présence d'un grand nombre de jeunes adultes sensibles ayant échappé à la fois à la rougeole et à la vaccination antirougeoleuse a majoré le risque de survenue d'une flambée de la maladie. Troisièmement, le virus rougeoleux a été introduit à São Paulo très probablement à la suite d'une importation d'Europe. Enfin, la forte densité de population de la ville a grandement facilité les contacts entre personnes infectées et personnes sensibles.

Canada reported a total of 570 confirmed measles cases during 1997. A large outbreak with over 300 cases occurred in a university community in British Columbia. Most cases occurred in young adults who had been previously vaccinated with 1 dose of measles vaccine. Genomic analysis of measles virus obtained from patients during this outbreak suggested that measles virus circulating in British Columbia was imported from Europe. Measles virus from the British Columbia outbreak spread to the neighbouring province of Alberta, where 245 cases were reported, most cases occurred in school-aged children who were previously vaccinated with 1 dose of measles vaccine.

The United States reported a provisional total of 135 confirmed measles cases during 1997. This is the lowest number of cases ever reported and is less than half the previous record low incidence of 309 cases in 1995. During an 8-week period, no indigenous measles cases were reported, suggesting an interruption of measles transmission. Fifty-seven (42%) of the reported cases were documented international importations, primarily from Europe and Asia. In 1995 and 1996, not a single measles importation from Latin American or Caribbean countries to the United States was reported. In 1997, however, there were 5 confirmed imported measles cases from Brazil, all from São Paulo. Spread from imported cases was limited and the largest outbreak in the United States during 1997 amounted to only 8 cases.

(Based on A report from the Special Program for Vaccines and Immunization, Pan American Health Organization, Washington, DC.)

**Editorial Note** Significant progress has been made towards eliminating measles virus from the Americas. Most countries have implemented PAHO's measles elimination strategy and indigenous measles virus circulation has been interrupted in large geographical areas of the Region. In addition, marked improvements have been made in measles surveillance throughout the Region, including the development of a regional measles laboratory network with at least 1 measles reference laboratory in every country.

While the relative resurgence of measles in the Americas during 1997 represents a major increase compared with the number of cases reported in 1996, these cases still represent only about 10% of those reported in 1990. Moreover, the measles cases reported in the Americas in 1996 – the last year for which comparable data were available – represented only 0.3% of the total reported global cases. Finally, measles case surveillance data, combined with molecular epidemiological information provided by PAHO's measles laboratory network, suggest the countries of the Americas are constantly being challenged by imported measles virus from other regions of the world where measles remains endemic.

The outbreak in Brazil can be considered as a "wake-up" call to the countries in the Region, demonstrating that the absence of measles virus circulation does not correspond with the absence of risk for measles outbreaks. This outbreak highlights some of the major challenges facing the Region in its fight against measles. Among them, the countries in the Americas need to be vigilant by maintaining the highest population immunity level possible in infants and children, as well as supplementing existing strategies by targeting measles vaccination to those adolescents and young adults who are at highest risk for being exposed to measles virus. Second, surveillance has to be strengthened to detect pockets of susceptibles and possible

Le Canada a notifié au total 570 cas de rougeole confirmés en 1997. Une importante flambée de plus de 300 cas s'est produite dans une université de Colombie-Britannique. La plupart des cas ont touché de jeunes adultes ayant été précédemment vaccinés par 1 dose de vaccin antirougeoleux. L'analyse génomique du virus isole chez certains malades au cours de cette flambée laisse à penser que le virus ayant circulé en Colombie-Britannique avait été importé d'Europe. Ce virus a gagné la province voisine d'Alberta, où 245 cas ont été notifiés, la plupart ont touché des enfants d'âge scolaire ayant précédemment reçu 1 dose de vaccin antirougeoleux.

En 1997, les États-Unis d'Amérique ont notifié un total provisoire de 135 cas de rougeole confirmés. Il s'agit du nombre de cas le plus faible jamais notifié, qui représente moins de la moitié de l'incidence la plus faible précédemment enregistrée, à savoir 309 cas en 1995. Durant 8 semaines, aucun cas autochtone de rougeole n'a été notifié, ce qui indique une interruption de la transmission de la maladie pendant cette période. Cinquante-sept des cas notifiés (42%) ont été provoqués par des virus importés, principalement d'Europe et d'Asie. En 1995 et 1996, aucun cas de rougeole originaire des pays d'Amérique latine ou des Caraïbes n'avait été notifié aux États-Unis d'Amérique. En revanche, en 1997, 5 cas de rougeole importés du Brésil ont été confirmés, tous en provenance de São Paulo. La propagation à partir de ces cas importés est restée limitée et la flambée la plus importante enregistrée en 1997 aux États-Unis n'a concerné que 8 cas.

(D'après Un rapport du Programme spécial des Vaccins et Vaccinations, Organisation panaméricaine de la Santé, Washington, DC.)

**Note de la Rédaction** Des progrès considérables ont été réalisés vers l'élimination de virus rougeoleux dans les Amériques. La plupart des pays ont mis en œuvre la stratégie d'élimination de la rougeole de l'OPS et l'on a réussi à interrompre la circulation autochtone du virus rougeoleux dans de vastes zones géographiques de la Région. En outre, la surveillance de cette maladie s'est sensiblement améliorée dans l'ensemble de la Région, avec notamment la mise en place d'un réseau régional de laboratoires de surveillance de la rougeole, comprenant au moins 1 laboratoire de référence par pays.

Si la resurgence relative de cette maladie au cours de l'année 1997 montre une augmentation importante du nombre de cas par rapport à 1996, ce nombre ne représente qu'environ 10% de celui notifié en 1990. De plus, les cas de rougeole notifiés dans les Amériques en 1996, dernière année pour laquelle on dispose de données comparables, ne représentaient que 0,3% du nombre total de cas rapportés dans le monde. Enfin, les données de la surveillance, associées à celles de l'épidémiologie moléculaire fournies par le réseau de laboratoires de l'OPS, indiquent que les pays des Amériques ont à faire face en permanence à des virus importés d'autres régions du monde où la maladie reste endémique.

La flambée survenue au Brésil doit être considérée comme un signal d'alarme par les pays de la Région, car elle leur rappelle que l'absence de circulation du virus rougeoleux ne veut pas nécessairement dire absence de risque de flambée de rougeole. Cette flambée souligne certaines grandes difficultés auxquelles se heurte la Région dans sa lutte contre cette maladie. Tout d'abord, il faut que les pays des Amériques restent vigilants et maintiennent chez les nourrissons et les enfants le degré d'immunité le plus élevé possible, tout en complétant les stratégies existantes par la vaccination des adolescents et des jeunes adultes qui risquent le plus d'être exposés au virus. Ensuite, la surveillance doit être renforcée afin de déceler les poches d'individus sensibles et les foyers éventuels de transmission des virus importés. Enfin, des

foci of transmission established by measles importations. Finally, increased efforts for control and regional elimination are needed in other regions of the world to decrease the quantity of measles virus that is exported to the Americas, and as a step towards global measles eradication. As long as measles virus circulates anywhere in the world, the Americas will remain at risk.

### Influenza A(H5N1) in Hong Kong Special Administrative Region of China

The results from a case-control study on avian influenza conducted in Hong Kong showed that visiting a poultry stall in the week before becoming ill was the strongest risk factor in contracting the virus. The aim of the case-control study was to compare different exposure risk factors between patients and controls. It covered a number of areas including exposure to the following: live poultry, food preparation, food eaten during the week before onset, and human illness during the week before onset. The results supported earlier findings that human-to-human transmission of the disease is weak.

The case-control study was carried out jointly by the Department of Health, Hong Kong and the Centers for Disease Control and Prevention (CDC) in Atlanta, Georgia, United States of America. The results of the study were released by the Hong Kong Department of Health, and were also presented at a session of the International Emerging Infectious Disease Conference held in Atlanta.

In all, 18 cases were confirmed influenza A(H5N1) in Hong Kong. The day of onset of illness of the last case was 28 December 1998. A 24-year-old female patient is still under treatment and in stable condition, while 11 others have been discharged after recovery. Six people died of the disease.

### Influenza

**Czech Republic** (11 March 1998)<sup>1</sup> Overall morbidity rates from acute respiratory infections remained at around 1 800 per 100 000 population in the last week of February and first week of March. Most regions registered a decrease of 8%-13% in the first week of March, but Prague and some districts in the south and east reported an 11% increase. Four cases of influenza A(H3N2) were identified in Prague, and 1 case of influenza A(H1N1) was diagnosed in the east in the first week of March.

**Greece** (11 March 1998)<sup>2</sup> A local outbreak of influenza-like illness occurred in Thessaloniki in February. The outbreak, which affected all age groups but particularly children under 15 years of age, reached a peak on around 15 February. Influenza A(H3N2) virus was isolated from 2 cases.

**Italy** (12 March 1998) - Influenza A(H3N2) viruses continued to be reported from epidemics in the north (Parma and Modena) during February. In the past 2 weeks, cases of influenza A and B were confirmed in children and adults during local outbreaks in Rome. One influenza A virus isolate from Rome was subtyped as influenza A(H1N1), the first to be reported this season.

<sup>1</sup> See No 11 1998, p 79  
<sup>2</sup> See No 8 1998, p 56

efforts accrus de lutte contre la maladie en vue de son élimination sur le plan régional sont nécessaires dans d'autres régions du monde si l'on veut abaisser le nombre de virus exportés vers les Amériques et progresser ainsi vers l'éradication mondiale de cette maladie. Tant que le virus rougeoleux continuera à circuler dans une région quelconque du globe, il constituera une menace pour les Amériques.

### La grippe A(H5N1) à Hong Kong, Région administrative spéciale de la Chine

Les résultats d'une étude cas-témoins sur la grippe aviaire conduite à Hong Kong ont montré que le principal facteur de risque était la visite d'un élevage de volailles dans la semaine précédant le début de la maladie. Le but de cette étude était de comparer différents facteurs d'exposition entre des malades et des sujets témoins. Elle a notamment porté sur les facteurs suivants: contacts avec des volailles vivantes, préparation d'aliments, consommation d'aliments, et exposition à des cas humains dans la semaine ayant précédé le début de la maladie. Les résultats ont confirmé les constatations antérieures selon lesquelles le niveau de la transmission interhumaine est faible.

L'étude cas-témoins a été menée conjointement par le Département de la Santé de Hong Kong et les *Centers for Disease Control and Prevention* (CDC) d'Atlanta, Géorgie, États-Unis d'Amérique. Les résultats, qui ont été communiqués par le Département de la Santé de Hong Kong, ont également été présentés à une séance de la Conférence internationale sur les maladies infectieuses émergentes tenue à Atlanta.

En tout, 18 cas dus au virus grippal A(H5N1) ont été confirmés à Hong Kong. Le dernier cas est tombé malade le 28 décembre 1998. Une femme de 24 ans, dont l'état est stationnaire, est encore en traitement. Onze autres malades ont guéri et quitté l'hôpital et 6 personnes sont décédées.

### Grippe

**Republique tchèque** (11 mars 1998)<sup>1</sup> Les taux de morbidité générale imputables aux infections respiratoires aiguës se sont maintenus autour de 1 800 pour 100 000 au cours de la dernière semaine de février et de la première semaine de mars. Dans la plupart des régions, on a enregistré une réduction de 8% à 13% au cours de la première semaine de mars, mais à Prague et dans certains districts du sud et de l'est, c'est une progression de 11% qui a été signalée. Quatre cas de grippe A(H3N2) ont été observés à Prague et 1 cas de grippe A(H1N1) a été diagnostiqué dans l'est au cours de la première semaine de mars.

**Grèce** (11 mars 1998)<sup>2</sup> En février, une flambée locale de syndrome grippal s'est déclarée à Thessalonique. Cette flambée, qui a touché l'ensemble des classes d'âge mais plus particulièrement les enfants de moins de 15 ans, a culminé vers le 15 février. On a isolé le virus A(H3N2) dans 2 cas.

**Italie** (12 mars 1998) On a continué à signaler la présence de virus A(H3N2) au cours de l'épidémie qui a sévi dans le nord (Parma et Modène) en février. Au cours des 2 dernières semaines, la grippe A et la grippe B ont été confirmées chez des enfants et des adultes lors de flambées locales qui se sont produites à Rome. L'examen d'un isolement de virus grippal A originaire de Rome a révélé qu'il appartenait au sous-type A(H1N1), le premier à être signalé cette saison.

<sup>1</sup> Voir N° 11, 1998, p 79  
<sup>2</sup> Voir N° 8, 1998, p 56

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**Norway** (10 March 1998) <sup>1</sup> Overall, the rate of influenza-like illness declined after a peak in the third week of February but 2 of the 3 northern counties still experienced increased activity in the first week of March. Influenza A, which has predominated throughout the season, continued to be diagnosed. Of 10 cases further subtyped in early March, 5 were of the H3N2 subtype and 5 of the H1N1 subtype.

**Slovakia** (10 March 1998) Influenza activity reached a peak in the third week of February, but remained below the average for the past 10 years. Local outbreaks have been reported among schoolchildren, mainly in the south-western part of the country. Influenza A and B have been diagnosed by antigen detection.

**Switzerland** (13 March 1998) <sup>2</sup> The percentage of medical consultations for influenza-like illness has declined to 5.84% after a peak at 6.5% in the first week of March. Of the 305 influenza viruses investigated this season, 6 were influenza B and 299 were influenza A, of which 86 were further subtyped as influenza A(H3N2) and 7 as influenza A(H1N1).

**United Kingdom** (17 March 1998) <sup>3</sup> The number of cases of influenza and influenza-like illness has declined after a peak in England in the third week of February and in Wales in the second week of March. The weekly number of laboratory-confirmed cases declined in the first week of March. Of the 440 influenza viruses investigated centrally, 205 were influenza A(H1N1) and 235 influenza A(H3N2). Influenza A(H3N2) has predominated since the beginning of February.

<sup>1</sup> See No 10, 1998, p 71  
<sup>2</sup> See No 9, 1998, p 62

**Norvege** (10 mars 1998) <sup>1</sup> Globalement, le taux de morbidité de des syndromes grippaux a reculé après avoir culminé au cours de la troisième semaine de février, mais dans 2 des 3 districts du nord l'activité grippale s'est poursuivie au cours de la première semaine de mars. C'est la grippe A, qui avait prédominé tout au long de la saison, qu'on a continué à diagnostiquer. Sur 10 cas ayant fait l'objet d'une caractérisation plus poussée début mars, 5 étaient dus à un virus appartenant au sous-type H3N2 et 5 à un virus du sous-type H1N1.

**Slovaquie** (10 mars 1998) L'activité grippale a culminé au cours de la troisième semaine de février tout en restant inférieure à la moyenne des 10 dernières années. On a signalé des flambées locales chez des écoliers, principalement dans le sud-ouest du pays. La grippe A et la grippe B ont été diagnostiquées par mise en évidence de leurs antigènes respectifs.

**Suisse** (13 mars 1998) <sup>2</sup> Le pourcentage de consultations médicales pour syndrome grippal est tombé à 5,84% après avoir culminé à 6,5% au cours de la première semaine de mars. Sur les 305 virus grippaux étudiés au cours de cette saison, 6 appartenaient au type B et 299 au type A, 86 d'entre eux ayant été caractérisés comme appartenant au sous-type A(H3N2) et 7 au sous-type A(H1N1).

**Royaume-Uni** (17 mars 1998) <sup>3</sup> Le nombre de cas de grippe et de syndromes grippaux a reculé après avoir culminé en Angleterre au cours de la troisième semaine de février et au Pays de Galles au cours de la deuxième semaine de mars. Le nombre hebdomadaire de cas confirmés en laboratoire a reculé au cours de la première semaine de mars. Sur 440 virus grippaux qui ont fait l'objet d'un examen au niveau central, 205 appartenaient au sous-type A(H1N1) et 235 au sous-type A(H3N2). Depuis le début février, c'est le sous-type A(H3N2) qui prédomine.

<sup>1</sup> Voir N° 10, 1998, p 71  
<sup>2</sup> Voir N° 9, 1998, p 62

**CORRIGENDUM**

WER No 10, 1998, pp 68-70

**Dracunculiasis**

Certification of transmission-free status

On page 69, under **Eastern Mediterranean Region**, the second paragraph should be **deleted and replaced by**

In the WHO Eastern Mediterranean Region, Sudan notified 43 034 cases for the first 11 months of 1997 with an endemic reporting rate of 34%

**RECTIFICATIF**

REH No 10, 1998, pp 68-70

**Dracunculose**

Certification de l'absence de transmission

A la page 69, sous **Région de la Méditerranée orientale**, **supprimer** le deuxième paragraphe et le **remplacer par**

Dans la Région OMS de la Méditerranée orientale, le Soudan a déclaré 43 034 cas au cours des 11 premiers mois de 1997 avec un taux de notification des villages d'endémie de 34%

**Infected areas as at 19 March 1998**

For criteria used in compiling this list see No 40 1997 p 304  
X Newly reported areas

**Zones infectées au 19 mars 1998**

Les critères appliqués pour la compilation de cette liste sont publiés dans le N° 40 1997 p 304  
X Nouvelles zones signalées

**Plague • Peste**

**Africa • Afrique**

- Madagascar**
- Antananarivo Province
- Ambodirano S Pref
- Antananarivo Avaradrano S Pref
- Ambatolampy S Pref
- Ajajzorobe S Pref
- Antananarivo S Pref
- Antananarivo District
- Antanifotsy S Pref
- Antsirabe I S Pref
- Antsirabe II S Pref
- Ambodiala District
- Ambohitsimanova District
- Ampasatanety District
- Manandona District
- Soanindrariny District
- Tsarofar District
- Vakinankarona District
- Arivonimamo S Pref

- Butafo S Pref
- Alakamisy-Anabavato District
- I anandrana S Pref
- Ivaratsiho S Pref
- Manjakandriana S Pref
- Miarinarivo S Pref
- Analavory District
- Anosibe Ifanja District
- Renovohira S Pref
- Soavinandriana S Pref
- Ambatoasana Centre
- Tsaroanomandy S Pref
- Antsirananana Province
- Andapa S Pref
- Doany District
- Fianarantsoa Province
- Ambatofinandrahana S Pref
- Ambondromositra District
- Andrefambohitra District
- Bevonotany District
- Soanherenana District
- Ambohimahasa S Pref
- Manandroy District
- Ambositra S Pref
- Ambatomanina District
- Ambohimahazo District

- Ambovombe Centre
- Andina District
- Anjoma N Ankona District
- Anjoma Nayona District
- Ankazoambo District
- Ivato District
- Ivony District
- Talata-Vohomena District
- Tsarasaotra District
- Fandrana S Pref
- Fiadanana District
- Fianarantsoa I S Pref
- Mahatsiyo District
- Fianarantsoa II S Pref
- Andoharanomaitso District
- Fianarantsoa II District
- Manandriana S Pref
- Mahajanga Province
- Toamasina Province
- Moramanga S Pref
- Malawi
- Southern Region
- Nsanje District

**Mozambique**

- Ilhe Province
- Mutarara District
- Tanzania United Rep of**
- Tanzania, Rep -Union de**
- Tanga Region
- Lushoto District
- Tanga District
- Uganda • Ouganda**
- Western Region
- Nebbi District
- Zaire • Zaïre**
- Haut Zaïre Province
- Ituri Sub Region
- Mahagi Administrative Zone
- Zambia • Zambie**
- Southern Province
- Namwala District
- Zimbabwe**
- Matabeland North
- Lupane District
- Nkayi District

**America • Amérique**

- Bolivia • Bolivie**
- La Paz Department
- Franz Tamayo Province
- Sud Yungas Province
- Valle Grande Province
- Brazil • Brésil**
- Bahia State
- Biritinga Municipio
- Candel Municipio
- Central Municipio
- Conceição Municipio
- Feira de Santana Municipio
- Iraquara Municipio
- Itacé Municipio
- Itaberaba Municipio
- Jussara Municipio
- Retirolandia Municipio
- Riachão do Jacuipé Municipio
- Senhor do Bonfim Municipio
- Serrinha Municipio
- Teófilândia Municipio

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<p><b>Paraba State</b>                      Araba Municipio                      Barra de S Rosa Municipio                      Cubati Municipio                      Olivenos Municipio                      Queimadas Municipio                      Remigio Municipio                      Solanea Municipio</p> <p><b>Peru • Perou</b>  <i>Cajamarca Department</i>                      Cuzco Province                      Llama District                      Miracosta District                      Toccoche District                      San Miguel Province                      Nancho District                      San Gregorio District                      San Miguel District                      San Pablo Province                      San Louis District                      La Libertad Department                      (Area not specified - Zone non precise)  <i>Lambayeque Department</i>                      (Area not specified - Zone non precise)                      Piura Department                      Ayabaca Province                      Canales District                      Lagunas District                      Montero District                      Paimas District                      Sapillica District                      Suyo District                      Huancabamba Province                      C de la Frontera District                      Canchaque District                      Huancabamba District                      Piura Province                      Las Lomas District</p> <p><b>ASIO • ASIE</b>  <b>Viet Nam</b>                      Gia Lai Province                      Cong Tum Province                      Lam Dong Province                      Phu Khan Province</p> <p><b>Cholera • Cholera</b></p> <p><b>Africa • Afrique</b>  <b>Angola</b>                      Bengo Province                      Bie Province                      Cubamba Province                      Huambo Province                      Huila Province                      Kuando-Kubango Province                      Kunene Province                      Kwanza Norte Province                      Kwanza-Sul Province                      Luanda Province                      Luanda Cap                      Malanga Province                      Namibe Province                      Uige Province                      Zaire Province</p> <p><b>Benin • Benin</b>                      Departement de Borgou</p> <p><b>Burkina Faso</b>                      Boulgou Province                      Soum Province</p> <p><b>Burundi</b>                      Bubanza Province                      Bubanza Arrondissement                      Cibitoke Arrondissement                      Bujumbura Province                      Bujumbura Arrondissement                      Bururi Province                      Makamba Arrondissement                      Rumonge Arrondissement                      Gitega Province                      Gitega Arrondissement                      Mahamba Province                      Nyanza lac Commune</p> <p><b>Cameroon • Cameroun</b>                      Province de l'Extreme-Nord                      Diamare Department                      Logone et-Chari Department                      Mayo-Danai Department                      Mayo-Sava Department                      Mayo-Tsanaga Department                      Littoral Province                      Moungo Department                      Wouri Department                      Province du Nord                      Benoue Department                      Province de l'Ouest                      Haut Nkam Department                      Mifi Department                      Province du Sud                      Ocean Department                      Province du Sud-Ouest                      Manyu Department                      Meme Department</p> <p><b>Cape Verde • Cap-Vert</b>                      Boa Vista Island - Ile de Boa Vista                      Brava Island - Ile de Brava                      Fogo Island - Ile de Fogo                      Maio Island - Ile de Maio                      Porto Novo Island - Ile de Porto Novo                      Sal Island - Ile de Sal                      Santiago Island - Ile de Santiago</p>	<p>Sao Nicolau Island - Ile de Sao Nicolau                      Sao Vicente Island - Ile de Sao Vicente</p> <p><b>Central African Republic</b>  <b>Republique centrafricaine</b>                      Ouaka Prefecture                      Kouango Sous Prefecture</p> <p><b>Chad • Tchad</b>                      Batha Prefecture                      Bui Prefecture                      Biltine Prefecture                      Chari Baguirmi Prefecture                      Guera Prefecture                      Kanem Prefecture                      Lac Prefecture                      Logone Occidental Prefecture                      Logone Oriental Prefecture                      Njamena Prefecture                      Ouaddai Prefecture                      Tandjilé Prefecture</p> <p><b>Comoros • Comores</b>                      Il. Grande Comore                      District de Fombouni                      District de Mitsamiouli                      District de Moroni                      District de Ouziouini</p> <p><b>Congo</b>                      Kouilou Region                      Pointe Noire</p> <p><b>Cote d'Ivoire</b>                      Departement du Centre                      Bouake District                      Departement du Nord                      Touba Sous Prefecture                      Departement de l'Ouest                      Gagno District                      Man Sous-Prefecture                      Departement du Sud                      Tabou District</p> <p><b>Dem Rep of Congo</b>  <b>Rep dem du Congo</b>                      Bandundu Province                      Bandundu District                      Equateur Province                      Haut Zaire Province                      Kinshasa Province                      Barumbu District                      Kinshasa District                      Limete/Kingaba District                      Lingwala District                      Kunguza Province (ex Shaba)                      Kivu Province</p> <p><b>Djibouti</b></p> <p><b>Ghana</b>                      Accra Region                      Accra District                      Greater Accra District                      Ashanti Region                      Central Region                      Eastern Region                      Upper East Region                      Volta Region                      Western Region</p> <p><b>Guinea • Guinee</b>                      Conakry Province                      Forccarah Prefecture</p> <p><b>Guinea-Bissau</b>                      Bissau District                      Bombo District                      Gabu District</p> <p><b>Kenya</b>                      Nyanza Province                      Homa Bay District                      Kisumu District                      Migori District                      Rachuonyo District                      Suba District</p> <p><b>Liberia • Liberia</b>                      Bong County                      Montserrado County</p> <p><b>Malawi</b>                      Northern Region                      Chitipa District                      Karonga District                      Southern Region</p> <p><b>Malï</b>                      Kayes Region                      Kayes Cercle                      Koulikoro Region                      Nara Cercle                      Mopti Region                      Segou Region                      Tombouctou Region</p> <p><b>Mauritania • Mauritanie</b>                      Nouakchott District                      1 Region                      Hodh el Chargui                      2 Region                      Hodh el Gharbi                      3 Region                      Assaba et Gudimakha                      4 Region                      Gorgol                      5 Region                      Brakna                      6 Region                      Trarza</p>	<p><b>Mozambique</b>                      Gaza Province                      Chitkwe District                      Macia District                      Xai Xai City                      Manhiça Province                      Boane District                      Manhiça District                      Maputo City                      Marracuene District                      Moamba District                      Saffala Province                      Beira City</p> <p><b>Niger</b>                      Diffa Department                      Dosso Department                      Maradi Department                      Niamey Department                      Tahoua Department                      Tillabery Department                      Zinder Department</p> <p><b>Nigeria • Nigeria</b>                      Abuja State                      Akwa Ibom State                      Anambra State                      Bauchi State                      Bendel State                      Borno State                      Borno State                      Gongola State                      Imo State                      Kano State                      Kano State                      Kebbi State                      Kwara State                      Lagos State                      Niger State                      Ogun State                      Ondo State                      Oyo State                      Plateau State                      Rivers State                      Sokoto State                      Taraba State                      Yobe State</p> <p><b>Rwanda</b>                      Cyangugu Prefecture                      Gisenyi Prefecture</p> <p><b>Sao Tome and Principe</b>                      Sao Tome-et-Principe                      Lumba District                      Sao Tome</p> <p><b>Senegal • Senegal</b>                      Region de Dakar                      Departement de Dakar                      Departement de Pikine                      Departement de Rufisque                      Region de Diourbel                      Departement de Louga                      Departement de Mbacke                      Departement de Touba                      Region de Fatick                      Departement de St-Louis                      Region de Thies                      Departement de Thies                      Region de Sine-Saloum                      Departement de Fatick</p> <p><b>Sierra Leone</b>                      Northern Province                      Kambia District                      Western Province                      Freetown</p> <p><b>Somalia • Somalie</b>                      Baidoa District                      Bardera District                      Belet Uen District                      Bossaso District                      Jibar District                      Kismayo District                      Marca District                      Mogadishu District</p> <p><b>Swaziland</b>                      (Area not specified - Zone non precise)</p> <p><b>Togo</b>                      Golfe District                      Kloto District                      Kozah District                      Lacs District                      Ogoou District                      Sokodoba District                      Vo District                      Yato District</p> <p><b>Uganda • Ouganda</b>                      Busoga Province                      Bugiri District                      Central Province                      Kampala City                      Western Province                      Kasese District</p> <p><b>United Rep of Tanzania</b>                      Rep - Union de Tanzanie                      Arusha Region                      Coast (Pwani) Region                      Dar es Salaam Region                      Iflala District                      Kinondoni District                      Dodoma Region                      Kilimanjaro Region                      Lindi Region</p>	<p><b>Mara Region</b>                      Mbuja Region                      Morogoro Region                      Mtwara Region                      Mwanza Region                      Rukwa Region                      Shinyanga Region                      Longa Region                      Zanzibar</p> <p><b>Zambia • Zambie</b>                      Central Province                      Lusaka                      Copperbelt Province                      Eastern Province                      Luapula Province                      Northern Province                      Southern Province</p> <p><b>América • Amerique</b>  <b>Argentina • Argentine</b>                      Jujuy Province                      Mendoza Province                      Salta Province                      Tucuman Province</p> <p><b>Belize</b>                      Cayo District                      Toledo District</p> <p><b>Bolivia • Bolivie</b>                      Beni Department                      Chuquisaca Department                      Cochabamba Department                      El Alto Department                      La Paz Department                      Oruro Department                      Potosi Department                      Riberalta Department                      Santa Cruz Department                      Tarija Department                      Tupiza Department</p> <p><b>Brazil • Bresil</b>                      Acre State                      Alagoas State                      Amapa State                      Amazonas State                      Bahia State                      Ceara State                      Distrito Federal State                      Espirito Santo State                      Maranhao State                      Mato Grosso State                      Minas Gerais State                      Para State                      Paraba State                      Parana State                      Pernambuco State                      Piau State                      Rio de Janeiro State                      Rio Grande do Norte State                      Rondonia State                      Sao Paulo State                      Sergipe State</p> <p><b>Chile • Chili</b>                      Antofagasta Province                      Ayllu Solor District                      San Pedro de Atacama District</p> <p><b>Colombia • Colombie</b>                      Amazonas Department                      Antioquia Department                      Atlantico Department                      Bolivar Department                      Boyaca Department                      Caldas Department                      Cauca Intendency                      Cauca Department                      Cesar Department                      Choco Department                      Cordoba Department                      Cundinamarca Department                      Guajira Department                      Huila Department                      Magdalena Department                      Meta Department                      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           Santa Barbara Department                      Valle Department                      Yoro Department</p> <p><b>Mexico • Mexique</b>                      Campeche State                      Chiapas State                      Chihuahua State                      Coahuila State                      Distrito federal                      Guanajuato State                      Guerrero State                      Hidalgo State                      Jalisco State                      Mexico State                      Michoacan State                      Morelos State                      Nuevo Leon State                      Oaxaca State                      Puebla State                      Queretaro State                      Quintana Roo State                      San Luis Potosi State                      Sonora State                      Tlaxcala State                      Veracruz State                      Yucatan State                      Zacateca State</p> <p><b>Nicaragua</b>                      Boaco Department                      Carazo Department                      Chinandega Department                      Chontales Department                      Esteli Department                      Granada Department                      Jinotega Department                      Leon Department                      Madriz Department                      Managua Department                      Masaya Department                      Matagalpa Department                      Nueva Segovia Department                      Rio San Juan Department                      Rivas Department</p> <p><b>Panama</b>                      Colon Province                      Comarca de San Blas                      Darien Province                      Panama Province</p> <p><b>Peru • Perou</b>                      Amazonas Department                      Arequipa Department                      Apurimac Department                      Arequipa Department                      Ayacucho 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<p><b>Madre de Dios Department</b>                  Maquegua Department                  Pasco Department                  Piura Department                  Puno Department                  San Martín Department                  Tarma Department                  Tumbes Department                  Ucayali Department</p> <p><b>Suriname</b>                  Marowijne District</p> <p><b>Venezuela</b>                  Anzoátegui State                  Apure State                  Aragua State                  Barinas State                  Cojedes State                  Delta Amacuro State                  Falcón District                  Guárico State                  Miranda State                  Mérida State                  Nueva Esparta State                  Portuguesa State                  Sucre State                  Trujillo State                  Zulia State</p> <p><b>ASIA • ASIE</b></p> <p><b>Afghanistan</b>                  Badakhshan Province                  Baghlan Province                  Balkh Province                  Helmand Province                  Herat Province                  Kabul Province                  Kandahar Province                  Kapisa Province                  Kunuz Province                  Nangarhar Province                  Zabul Province</p> <p><b>Bhutan • Bhoutan</b>                  Mongar District                  Pemagatse District                  Phuntsholing District                  Punakha District                  Samdrupjongkhar District                  Thimphu District                  Thimphu District</p> <p><b>Cambodia • Cambodge</b>                  Kampong Province                  Kompong Cham Province</p> <p><b>China • Chine</b>                  (Area not specified - Zone non précisée)</p> <p><b>India • Inde</b>                  Andhra Pradesh State                  Hyderabad District                  Visakhapatnam District                  Delhi Territory                  Gujarat State                  Haryana State                  Karnataka (Mysore) State                  Bangalore District                  Bidar District                  Chitradurga District                  Gulburga District                  Hassan District                  Kolar District                  Mandya District                  Raichur District                  Tumkur District                  Kerala State                  Madhya Pradesh State                  Maharashtra State                  Akola District                  Amravati District                  Nagpur District                  Nandad District                  Osmanabad District                  Parbhani District                  Pune District                  Sangli District                  Thane District                  Punjab State</p>	<p><b>Tamil Nadu State</b>                  Anna District                  Chingleput District                  Madras District                  Madurai District                  North Arcot District                  Pudukkottai District                  Thanjavur District                  Tiruchirappalli District                  Tirunelveli District                  Vellore District                  Villupuram District</p> <p><b>Uttar Pradesh State</b>                  West Bengal State                  Calcutta</p> <p><b>Iran, Islamic Rep of</b>                  Islamic Rep of Iran                  Kerman Province                  Khuzestan Province                  Sistan and Baluchistan Province                  Iranshahr District                  Nikshahr District</p> <p><b>Lao People's Democratic Republic</b>                  République démocratique populaire lao                  Attapeu Province                  Bokeo Province                  Khammouane Province                  Luangnamtha Province                  Louangphabang Province                  Oudomxay Province                  Saravanne Province                  Savannakhet Province                  Phine District                  Sayaboury Province                  Sekong Province</p> <p><b>Malaysia • Malaisie</b>                  Selangor State                  (Areas to be notified - Zones a notifier)</p> <p><b>Mongolia • Mongolie</b>                  Orkhon Province                  Ulan Tolgoi District                  Selenge Province                  Khovd District                  Iwo Province                  Zaamar District</p> <p><b>Myanmar</b>                  Yangon Division                  Yangon</p> <p><b>Nepal • Nepal</b>                  Jhapa District                  Khatmandu District</p> <p><b>Philippines</b>                  National Capital Region                  Region 4                  Aurora Province                  Cavite Province                  Mindoro Province                  Palawan Province                  Rizal Province                  Region 5                  Albay Province                  Camarines Norte Province                  Camarines Sur Province                  Catanduanes Province                  Masbate Province                  Sorsogon Province                  Region 6                  Iloilo Province                  Region 7                  Cebu Province                  Region 8                  Leyte North Province                  Leyte South Province                  Samar Western Province                  Region 9                  Zamboanga City                  Zamboanga Norte Province                  Region 11                  Davao City                  Gen Santos City                  Region 12                  Cotabato City</p>	<p><b>Sri Lanka</b>                  Puttalam Health Division                  Arachchikattuwa District                  Chilaw District                  Marawila District                  Karenegala Health Division                  Galle District</p> <p><b>Viet Nam</b>                  Binh Tri Thien Province                  Nghia Binh Province                  Phu Khanh Province</p> <p><b>Yellow fever • Fievre jaune</b></p> <p><b>Africa • Afrique</b></p> <p><b>Angola</b>                  Bengo Province                  Luanda Province</p> <p><b>Benin • Bénin</b>                  Department de l'Atakora                  Kerou S Pref                  Département du Borgou                  Bankoara S Pref                  Bembereke S Pref                  Gogounou S Pref                  Karimama S Pref                  Malanville S Pref                  Sinende S Pref</p> <p><b>Cameroon • Cameroun</b>                  Province de l'Extrême-Nord                  Mayo Sava Department                  Mayo Tsanga Department</p> <p><b>Gabon</b>                  Province Ogooue Ivindo                  Makouko</p> <p><b>Gambia • Gambie</b>                  Upper River Division</p> <p><b>Ghana</b>                  Upper East Region                  (Areas to be notified - Zones non encore précisées)                  Upper West Region                  Jirpa District</p> <p><b>Guinea • Guinée</b>                  Sierra Region</p> <p><b>Liberia • Libéria</b>                  Bassa County                  Buchanan District                  Bom County                  Tubmanourg                  Bong County                  Salala                  Lofa County                  (district not yet notified - district pas encore notifié)                  Sinoe County                  Greenville</p> <p><b>Nigeria • Nigeria</b>                  Anambra State                  Bauchi State                  Bendel State                  Benue State                  Cross River State                  Kaduna State                  Kwara State                  Imo State                  Lagos State                  Niger State                  Ogun State                  Oyo State                  Plateau State</p> <p><b>Sierra Leone</b>                  Lushun Province                  Kenema District</p> <p><b>Sudan • Soudan</b>                  Territory South of 12° N                  Territoire situé au sud du 12° N</p> <p><b>Zaire • Zaïre</b>                  Territory North of 10° S                  Territoire situé au nord du 10° S</p>	<p><b>América • Amérique</b></p> <p><b>Bolivia • Bolivie</b>                  Beni Department                  Bolivian Province                  Itenez Province                  Cochabamba Department                  Ayopayo Province                  Carrasco Province                  Chapare Province                  La Paz Department                  Larecaja Province                  Murillo Province                  Nor Yungas Province                  Quinuni Province                  Sud Yungas Province                  Santa Cruz Department                  Andres Banez Province                  Cordillera Province                  Florida Province                  Gutierrez Province                  Lhilo Province</p> <p><b>Brazil • Brésil</b>                  Amapa State                  Macapa Municipio                  Amazonas State                  Carere Municipio                  Maranhao State                  Barra do Corda Municipio                  Mirador Municipio                  Para State                  Agua Azul do Norte Municipio                  Alenquer Municipio                  Sao Felix do Xingu Municipio                  Tucuma Municipio</p> <p><b>Colombia • Colombie</b>                  Antioquia Department                  Anon Municipio                  Taraza Municipio                  Yondo Municipio                  Arauca Intendencia                  Arauca Municipio                  Saravena Municipio                  Boyaca Department                  Chita Municipio                  Boyaca Municipio                  Cuqueta Intendencia                  Belera de los Andaquies Municipio                  El Doncello Municipio                  San Vicente de Caguán Municipio                  Casanare Intendencia                  Hato Corozal Municipio                  Tamaca Municipio                  Yopal Municipio                  Cesar Department                  Valledupar Municipio                  Choco Department                  Rio Sucio Municipio                  Cunamamarca Department                  Maya Municipio                  Guarare Intendencia                  Miraflores Municipio                  San Juan del Guaviare Municipio                  Meta Intendencia                  Cabuyaro Municipio                  La Primavera Municipio                  San Carlo de Guaroa Municipio                  Villavicencio Municipio                  Vista Hermosa Municipio                  Villa de Santander Department                  Cucuta Municipio                  Tibu Municipio                  Cucuta Intendencia                  Toledo Municipio                  Putumayo Intendencia                  Puerto Asis Municipio                  Santander Department                  Bucaramanga Municipio                  Cimitarra Municipio                  El Carmen Municipio                  Vianada Department                  Puerto Trujillo Municipio</p>	<p><b>Ecuador • Equateur</b>                  Morona Santiago Province                  Napo Province                  Humayac District                  Pastaza Province                  Sucumbos Province                  Zamora Chinchipe Province</p> <p><b>Peru • Pérou</b>                  Amazonas Department                  Ancash Department                  Ayacucho Department                  Huania Province                  San Jose Santillana District                  Tarma Department                  La Convencion Province                  Echarate District                  Ica District                  Maraura District                  Santa Ana District                  Huamaco Department                  Huamachuco Province                  Monzon District                  Leoncio Prado Province                 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C. Castello District                  Leoncio Prado District                  Monzon District                  P. Lujando District                  Rupa Rupa District                  Maranon Province                  Cholon District                  Junin Department                  Chanchamayo Province                  Chanchamayo District                  Perene District                  San Luis Sevaró District                  Vilco District                  Suyo Province                  Corral District                  Mazamari District                  Pasaga District                  Pichanah District                  Rio Negro District                  Rio Tambo District                  Suyo District                  Loreto Department                  Uayash Province                  Contamana District                  Purus District                  Madre de Dios Department                  Manu Province                  Madre de Dios District                  Manu District                  Tambopata Province                  Inambari District                  Las Piedras District                  Tambopata District                  Pasco Department                  Puno Department                  Sandia Province                  San Juan del Oro District                  San Roman District                  Vilcabamba District                  San Martin Department                  Huallaga Province                  Bellavista District                  Saposoa District                  Lamas Province                  Lamas District                  Tabalazos District                  Mariscal Cáceres Province                  Campanilla District                  San Martin Province                  Juan Guerra District                  Saucé District                  Tocache Province                  La Polvora District                  Nuevo Progreso District                  Tocache District                  Uchiza District                  Uayali Department                  Coronel Prévillo Province                  Calleria District                  Padre Abad Province                  Padre Abad District</p>
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**DISEASES SUBJECT TO THE REGULATIONS / MALADIES SOUMISES AU RÈGLEMENT**

**Notifications received from 13 to 19 March 1998** / **Notifications reçues du 13 au 19 mars 1998**

C - cases, D - deaths, - data not yet received, I - imported, r - revised, s - suspect / C - cas, D - décès, - données non encore disponibles, I - importé, r - révisé, s - suspect

**Cholera • Choléra**

<b>Africa • Afrique</b>	C	D
Comoros - Comores	22 II-11 III	5
Democratic Republic of the Congo <sup>1</sup> / République démocratique du Congo <sup>1</sup>	1 I-21 II	25

**Asia • Asie**

Hong Kong Special Administrative Region of China - Hong Kong, Region administrative speciale de la Chine	C	D
	8-16 III <sup>2</sup>	0

<sup>1</sup> Cases occurred in a refugee camp in Aru District Kasai-Oriental Province - Ces cas sont survenus dans un camp de réfugiés dans le district de Aru Province de Kasai-Oriental  
<sup>2</sup> Date of notification - Date de la notification

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**Annex 8**  
*Morbidity and Mortality Weekly Report (MMWR), March 20, 1998/Volume 47/No. 10*  
*Progress towards Elimination of Measles from the Americas*

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# MMWR

MORBIDITY AND MORTALITY WEEKLY REPORT

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## Progress Toward Elimination of Measles from the Americas

In 1994, the Pan American Health Organization (PAHO) established the goal of eliminating measles from the Western Hemisphere by 2000 (1). To reach this goal, PAHO developed a measles-elimination strategy that includes three vaccination components ("catch-up," "keep-up," and "follow-up"\*) and integrated epidemiologic and laboratory surveillance (2–5). The aim of the strategy is to achieve and maintain high levels of measles immunity among infants and children and detect all chains of transmission of measles virus through careful surveillance. This report updates measles surveillance data through February 1998 and summarizes the impact of elimination strategies on measles in the Americas.

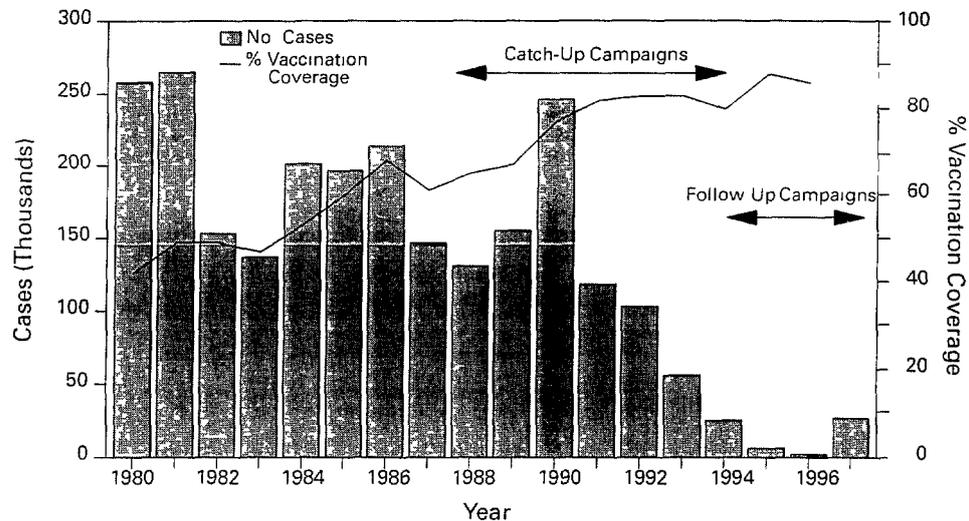
Each country in the Region of the Americas, except the United States, the French Antilles, and the Netherlands Antilles, conducted measles "catch-up" campaigns during 1987–1994. Vaccination coverage achieved during these campaigns was 94% regionwide, and country-specific coverage ranged from 71% to 99%. In addition, routine measles vaccination coverage among infants increased from 42% in 1980 to 86% in 1996 (Figure 1). In 1996, a total of 27 (57%) of 47 countries and territories achieved >90% coverage, 15 (32%) achieved 80%–90% coverage, and five (11%) achieved <80% coverage in their routine vaccination services. Since 1994, a total of 26 (55%) of 47 countries and territories also have conducted "follow-up" vaccination campaigns.

The annual number of reported measles cases in the region decreased substantially (Figure 1). In 1996, a record low 2109 confirmed measles cases was reported from the region. Of the 47 countries and territories that provided weekly measles surveillance data to PAHO, 29 (62%) reported no confirmed cases, and 38 (81%) reported ≤10 cases. Most of the region was free of measles virus circulation during 1996.

In 1997, however, a resurgence of measles occurred in the region. Provisional data from January 1997 through February 1998 indicate that 88,485 suspected measles cases were reported from the countries. Of these, 27,635 (31%) have been confirmed, 33,120 (37%) have been discarded, and 27,730 (31%) are under investigation.

Of the 27,635 confirmed cases in 1997, a total of 26,919 (97%) were confirmed by laboratory testing or linked epidemiologically to a laboratory-confirmed case, and

\*Catch-up is defined as a one-time vaccination campaign targeting all children aged 9 months–14 years regardless of history of measles disease or vaccination status, keep-up is defined as routine services aimed at vaccinating >90% of each successive birth cohort, and follow-up is defined as a vaccination campaign conducted at least every 4 years targeting all children aged 1–4 years.

*Elimination of Measles — Continued***FIGURE 1** Reported number of confirmed measles cases and reported measles vaccination coverage, by year\* — Region of the Americas, 1980–1997

\*Coverage for children at age 1 year through routine vaccination services (excluding Canada and the United States)

Source Pan American Health Organization/World Health Organization

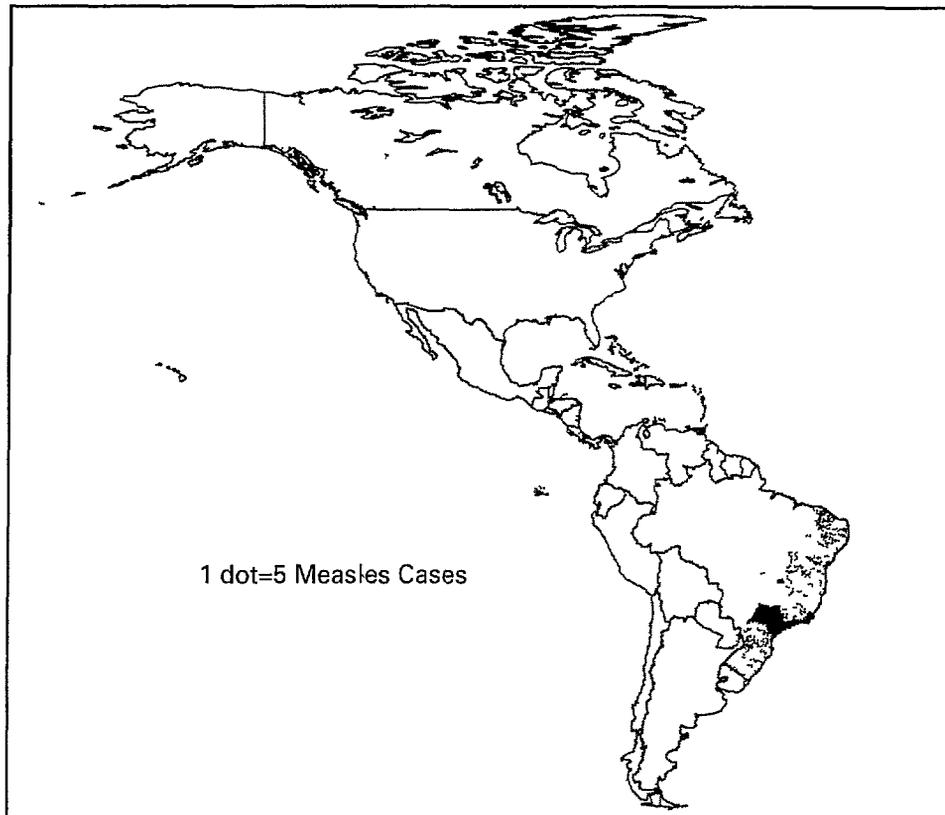
716 (3%) were confirmed clinically, without laboratory investigation. Brazil (26,348 confirmed cases) and Canada (570 confirmed cases) accounted for 97% of the total confirmed cases in the region. The United States (135 cases), Paraguay (198), Guadeloupe (116), Argentina (96), Chile (59), Venezuela (27), and Costa Rica (15) all reported >10 confirmed measles cases during 1997.

#### Brazil

Of the 26,348 confirmed cases reported from Brazil, 20,186 (77%) were reported from São Paulo (Figure 2), the only state that did not conduct a follow-up measles vaccination campaign in 1995. Most cases during this outbreak occurred in persons residing in the greater São Paulo metropolitan area. Of the 19,322 confirmed measles cases reported from São Paulo for which patient age was known, 9,938 (51%) occurred in persons aged 20–29 years. The highest age-specific incidence rates were reported for infants aged <1 year (456 cases per 100,000 population), young adults aged 20–29 years (156), and children aged 1–4 years (45).

Many cases occurred among young adults who were members of groups congregating in enclosed environments, including male migrant workers from rural areas, students, health-care workers, tourist industry workers, and military recruits. Twenty measles-related deaths were reported, 17 (85%) occurred among infants aged <1 year.

Genomic sequencing of virus isolates from Brazil, performed by CDC's Respiratory and Enteric Viruses Branch, demonstrated that the virus circulating in São Paulo was similar to virus isolates recently obtained from Western Europe, suggesting that the virus responsible for the outbreak may have been imported from Europe. The

*Elimination of Measles — Continued***FIGURE 2** Reported number of confirmed measles cases (n=27,635), by country — Region of the Americas, 1997

measles virus circulating in São Paulo spread to almost every other state in Brazil. Other Brazilian states reporting large numbers of measles cases included Bahia (1013 cases), Minas Gerais (626), Ceara (594), Rio de Janeiro (577), Parana (462), and the Federal District (432). Other countries in the region documenting spread from São Paulo were Argentina, Chile, Costa Rica, Paraguay, Peru, and the United States. Epidemiologic investigation is under way to determine specific risk factors for measles in São Paulo.

Several factors may have facilitated widespread measles transmission in the greater São Paulo metropolitan area in 1997. First, the lack of a timely follow-up vaccination campaign in 1995 for children aged 1–4 years, combined with low routine vaccination coverage among infants, resulted in rapid accumulation of susceptible preschool-aged children. Second, the presence of large numbers of susceptible young adults who had not had natural measles infection or measles vaccination increased the risk for a measles outbreak. Third, measles virus was probably imported from

*Elimination of Measles — Continued*

Europe into São Paulo. Finally, the high population density of São Paulo greatly facilitated contact between infected and susceptible persons (6).

**Canada**

During 1997, Canada reported 570 confirmed measles cases. Of these, >300 cases occurred in a university community in British Columbia. Most cases occurred in young adults who had been vaccinated previously with one dose of measles vaccine. Genomic analysis of measles virus obtained from patients during this outbreak suggested that measles virus circulating in British Columbia was imported from Europe. Measles virus from the outbreak in British Columbia spread to the neighboring province of Alberta, where 245 cases were reported, most cases occurred in school-aged children who were vaccinated previously with one dose of measles vaccine.

**United States**

During 1997, the United States reported a provisional total of 135 confirmed measles cases. This is the lowest number of cases ever reported and is less than half the previous record low incidence of 309 cases in 1995. During a 7-week period, no indigenous measles cases were reported, suggesting an interruption of measles transmission. Fifty-seven (42%) of the reported cases were documented as international importations, primarily from Europe and Asia. In 1995 and 1996, no documented importations from Latin American or Caribbean countries to the United States were reported.<sup>†</sup> In 1997, however, five confirmed imported measles cases were reported from Brazil, all from São Paulo. Spread from imported cases was limited, and the largest outbreak in the United States during 1997 comprised eight cases.

*Reported by Special Program for Vaccines and Immunization, Pan American Health Organization, Washington, DC*

**Editorial Note** Substantial progress has been made toward eliminating measles virus from the Americas. Most countries have implemented PAHO's measles-elimination strategy, and indigenous measles virus circulation has been interrupted in large geographic areas of the region. In addition, improvements have been made in measles surveillance throughout the region, including the development of a regional measles laboratory network with at least one measles reference laboratory in every country.

Although the relative resurgence of measles in the Americas during 1997 represented a major increase over the number of cases reported in 1996, these cases still represented only approximately 10% of those reported in 1990. Moreover, the measles cases reported in the Americas in 1996, the last year for which comparable data were available, represented only 0.3% of the total reported global cases (7). Measles case surveillance data, combined with molecular epidemiologic information provided by PAHO's measles laboratory network, suggest the countries of the Americas are constantly challenged by imported measles virus from other regions of the world in which measles remains endemic (8,9).

The outbreak in Brazil demonstrates that the absence of measles virus circulation does not indicate the absence of risk for measles outbreaks. This outbreak highlights several major challenges facing the region. First, the countries of the Americas need to achieve and maintain the highest population immunity level possible in infants and children and to supplement existing strategies by targeting measles vaccination to

<sup>†</sup>In 1995 one case that could have been imported from a Latin American country was reported, however subsequent investigation revealed no evidence of measles transmission in that country.

*Elimination of Measles — Continued*

adolescents and young adults at highest risk for exposure to measles virus. Second, surveillance needs to be strengthened to detect population groups susceptible to measles and possible foci of transmission established by measles importations. Finally, increased efforts for control and regional elimination of measles are needed in other regions of the world to decrease the quantity of measles virus exported to the Americas as a step toward global measles eradication (10).

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### **Suicide Among Black Youths — United States, 1980-1995**

Although black youths have historically had lower suicide rates than have whites, during 1980-1995, the suicide rate for black youths aged 10-19 years increased from 2.1 to 4.5 per 100,000 population. As of 1995, suicide was the third leading cause of death among blacks aged 15-19 years (1), and high school-aged blacks were as likely as whites to attempt suicide (2). This report summarizes trends in suicide among blacks aged 10-19 years in the United States during 1980-1995 and indicates that suicidal behavior among all youths has increased, however, rates for black youths have increased more, and the gap between rates for black and white youths has narrowed.

Data for suicides were obtained from CDC's National Center for Health Statistics Underlying Cause of Death Mortality file (3) and were based on the *International Classification of Diseases, Ninth Revision*\*. Population estimates were obtained from the Bureau of the Census decennial estimates for 1980 and 1990. Age-specific rates were calculated per 100,000 population.

During 1980-1995, a total of 3030 blacks aged 10-19 years committed suicide in the United States. During this period, the suicide rate for blacks aged 10-19 years increased 114%. In 1980, the suicide rate for whites aged 10-19 years was 157% greater

\*Suicide codes were for poisoning (E950.0-E952.9), strangulation (E953.0-E953.9), firearms use (E955.0-E955.4), and cutting (E956.0-E956.9).

*Suicide Among Black Youths — Continued*

than the rate for blacks. By 1995, the rate for whites was only 42% greater than the rate for blacks.

Among blacks and whites aged 10–19 years, the suicide rate increased most for blacks aged 10–14 years (233%), compared with a 120% increase for whites (Figure 1). Among blacks aged 15–19 years, the suicide rate increased 126%, compared with 19% for whites (Figure 2). Among black males aged 15–19 years, the suicide rate increased 146%, compared with 22% for white males.

Firearms use was the predominant method of suicide for blacks aged 10–19 years, accounting for 66% of suicides in this group. Among blacks aged 15–19 years, firearms use accounted for 69% of suicides, followed by strangulation (18%). Among black males aged 15–19 years, firearms use accounted for 72% of suicides, followed by strangulation (20%). Firearm-related suicides accounted for 96% of the increase in the suicide rate for blacks aged 10–19 years.

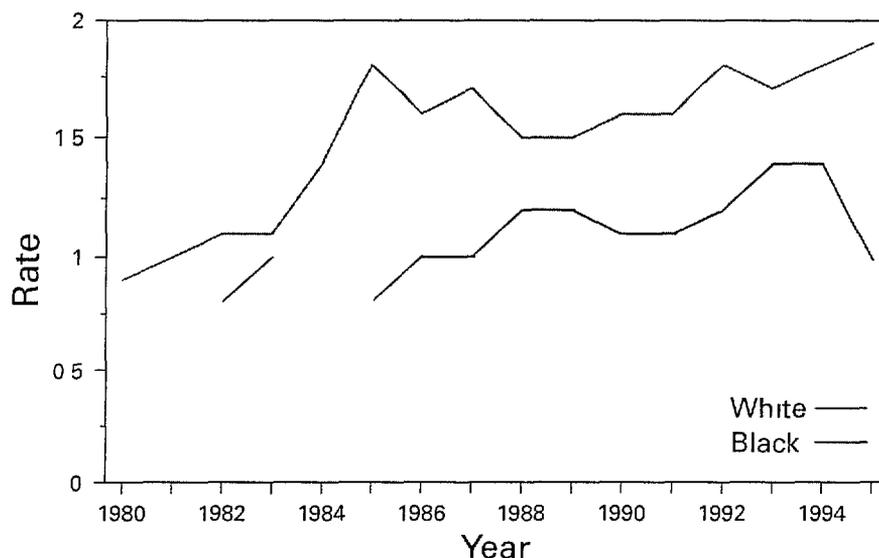
During 1980–1995, trends in suicide rates for black youths differed by region.<sup>†</sup> The largest increase in suicide rates occurred for blacks aged 15–19 years in the South (214%), followed by the Midwest (114%). By sex, the largest increase in suicides occurred among black males aged 15–19 years in the South (223%).

Reported by Div of Violence Prevention, National Center for Injury Prevention and Control, CDC

**Editorial Note** Although suicides have increased overall among youths (4), the findings in this report indicate that, during 1980–1995, suicide rates for black youths have

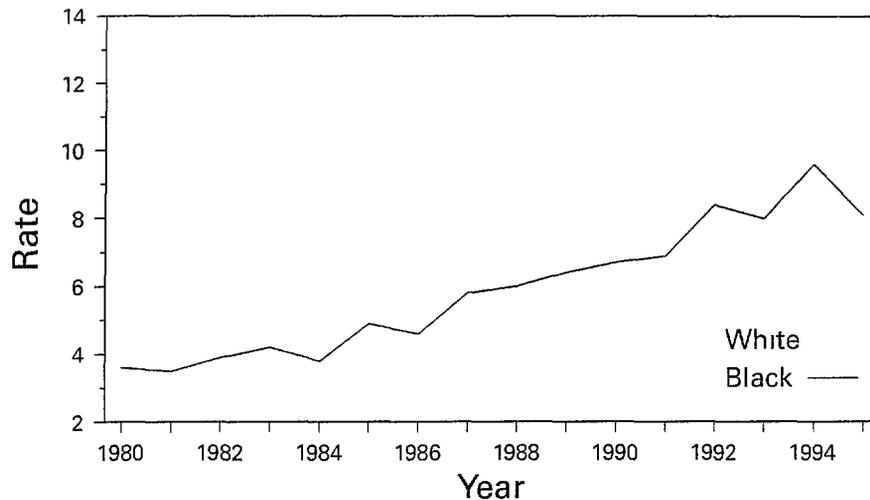
<sup>†</sup> *Northeast*—Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, and Vermont; *Midwest*—Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, and Wisconsin; *South*—Alabama, Arkansas, Delaware, District of Columbia, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, and West Virginia; *West*—Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming.

**FIGURE 1** Suicide rates\* for blacks and whites aged 10–14 years, by year — United States, 1980–1995<sup>†</sup>



\*Per 100,000 population

<sup>†</sup>Broken lines indicate years with <20 cases

*Suicide Among Black Youths — Continued***FIGURE 2 Suicide rates\* for blacks and whites aged 15–19 years, by year — United States, 1980–1995**

\*Per 100,000 population

increased substantially, particularly in the South. In addition, the difference in suicide rates for blacks and whites has decreased substantially.

Risk factors associated with suicides among youth include hopelessness, depression, family history of suicide, impulsive and aggressive behavior, social isolation, a previous suicide attempt, and easier access to alcohol, illicit drugs, and lethal suicide methods (5). Changes in some risk factors (e.g., breakdown of the family and easier access to alcohol, illicit drugs, and lethal suicide methods) may account for the increasing suicide rate among youths. However, these changes may not account for the increase in suicides among blacks aged 10–19 years. One possible factor may be the growth of the black middle class (6). Black youths in upwardly mobile families may experience stress associated with their new social environments. Alternatively, these youths may adopt the coping behaviors of the larger society in which suicide is more commonly used in response to depression and hopelessness (7). Another factor may be differential recording of suicide as a cause of death on death certificates. Suicide as a cause of death may be entered less readily for black youths than for white youths (8).

In addition, risk factors associated with suicide among youths in general may not predict suicidal behaviors among black youths. Differences in the social environments and life experiences of black and white youths suggest the need to determine whether risk factors for suicide in black youths differ from those of whites. For example, the exposure of black youths to poverty, poor educational opportunities, and discrimination may have negatively influenced their expectations about the future and, consequently, enhanced their resiliency to suicide (9).

*Suicide Among Black Youths — Continued*

Although youth suicide prevention programs exist, little is known about their effectiveness in reducing suicidal behavior (10). These programs also may not address the risk factors associated with the increasing suicide rates for black youths. If risk factors for suicide differ for black and white youths, existing programs for suicide prevention that target black youths may need to be modified.

A better understanding of the risk factors associated with suicide among black youths is needed to develop appropriate prevention and treatment programs. Evaluations of existing programs to prevent youth suicide should examine the potential for differential effects on black youths.

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**Update Influenza Activity — United States, 1997–98 Season**

In collaboration with the World Health Organization (WHO), its collaborating laboratories, and state and local health departments, CDC conducts surveillance to monitor influenza activity and to detect antigenic changes in the circulating strains of influenza viruses. This report summarizes influenza surveillance in the United States from September 28, 1997, through March 7, 1998, and presents reports of outbreaks in long-term care facilities (LTCFs) in three states and at a military base. The findings indicate that this season has been dominated by influenza A(H3N2) viruses and characterized by a sustained elevation in pneumonia and influenza (P&I)-related deaths.

Influenza activity in the United States began during October, increased sharply during December and January, peaked during late January through early February, then declined. From September 28, 1997, through March 7, 1998, WHO collaborating laboratories tested 64,421 clinical specimens for respiratory viruses, and 10,264 (16%) were positive for influenza. Of these, 10,247 (99.8%) were influenza A, and 17 (0.2%) were influenza B. Of 2,453 influenza A isolates that were subtyped, 2,447 (99.8%) were A(H3N2), and six (0.2%) were A(H1N1). Of the H3N2 influenza A viruses, 188 were

*Influenza Activity — Continued*

antigenically characterized by CDC, 44 (23%) were similar to A/Nanchang/933/95(H3N2), the A/Wuhan/359/95(H3N2)-like component in the 1997–98 influenza vaccine and 144 (77%) were similar to A/Sydney/05/97(H3N2), a related but antigenically distinguishable variant of the A(H3N2) component of the 1997–98 influenza vaccine. All eight antigenically characterized influenza B and five of six antigenically characterized influenza A(H1N1) viruses were similar to the 1997–98 influenza vaccine components.

State and territorial epidemiologists first reported widespread influenza activity\* from Pennsylvania for the week ending December 20. Influenza activity peaked in the United States during the week ending February 7, when 46 states and New York City reported regional or widespread activity. During the week ending March 7, the number of states reporting regional or widespread influenza activity declined to 27.

The percentage of patient visits to sentinel physicians for influenza-like illness (ILI) first exceeded baseline levels (0–3%) during the week ending January 3, peaked at 5% from January 18 through February 7, and returned to baseline levels during the week ending February 21. The percentage of deaths attributed to P&I as reported by the vital statistics offices of 122 cities first exceeded the epidemic threshold† during the week ending January 10 and has remained elevated for 9 consecutive weeks.

As of March 7, a total of 359 outbreaks of ILI in LTCFs have been reported to CDC from the state health departments in Connecticut, New York, and Virginia. Three outbreaks in LTCFs and one on a military base are described in this report. In these investigations, disease and influenza vaccination status of residents of LTCFs and vaccination status of military squadron members were ascertained by medical record review. Among staff of LTCFs and among military squadron members, disease status was ascertained by self-administered questionnaires. ILI was defined as either 1) a positive culture or rapid-antigen test for influenza in a person with respiratory symptoms or 2) cough and either perceived or measured fever ( $\geq 100.5$  F [ $\geq 37.8$  C]) or chills. For the LTCF in Connecticut, measured fever was defined as a temperature  $\geq 100.5$  F ( $\geq 38.1$  C). An influenza-related death was defined as a death that occurred within 2 weeks of onset of ILI, with no intervening asymptomatic period and no alternative explanation. (1) Vaccine effectiveness (VE) was calculated as  $VE = [ARU - ARV / ARU] \times 100$ , ARU is the attack rate in unvaccinated persons, and ARV is the attack rate in vaccinated persons. (2)

**Connecticut**

All Connecticut LTCFs are required to report outbreaks of respiratory disease to the Connecticut Department of Public Health (CDPH). When reports are received, LTCFs are encouraged to test for influenza. Rapid-antigen testing and/or culture are made available at no cost by the state laboratory during the influenza season. LTCFs are encouraged to implement influenza outbreak control measures as recommended by the Advisory Committee on Immunization Practices (ACIP). (3)

\*Levels of activity are 1) *no activity*; 2) *sporadic*—sporadically occurring influenza-like illness (ILI) or culture-confirmed influenza with no outbreaks detected; 3) *regional*—outbreaks of ILI or culture-confirmed influenza in counties with a combined population of  $< 50\%$  of the state's total population; and 4) *widespread*—outbreaks of ILI or culture-confirmed influenza in counties with a combined population of  $\geq 50\%$  of the state's total population.

†The epidemic threshold is 1.645 standard deviations above the seasonal baseline. The expected seasonal baseline is projected using a robust regression procedure in which a periodic regression model is applied to observed percentages of deaths from P&I since 1983.

*Influenza Activity — Continued*

From December 1, 1997, through February 28, 1998, a total of 118 (44%) of 271 LTCFs reported respiratory outbreaks to CDPH, 21 were confirmed as influenza A outbreaks. On December 12, 1997, a LTCF in New Haven County reported an outbreak of influenza A. Because this was the first confirmed influenza outbreak in the state for the 1997–98 season, an epidemiologic investigation was conducted.

The LTCF has 172 staff and 131 residents distributed in four units. Of nasopharyngeal swab specimens obtained from 42 residents with ILI, 20 (48%) were positive for influenza A by rapid-antigen testing. Influenza A (H3N2) was identified by culture in nine specimens at the state laboratory, and three isolates were further characterized at CDC by hemagglutination-inhibition testing as A/Sydney/05/97(H3N2)-like. Medical records of all residents were reviewed. From December 6, 1997, through January 3, 1998, a total of 57 (49%) of 116 vaccinated residents and seven (47%) of 15 unvaccinated residents developed ILI (VE=5% [95% confidence interval (CI)=87%–41%]). Five (4%) vaccinated residents and one (7%) unvaccinated resident died from influenza-related complications (VE=35% [95% CI=41%–91%]). Beginning December 17, amantadine treatment was provided to two persons with ILI, and starting December 19, amantadine prophylaxis was provided to 21 residents who were asymptomatic.

**New York**

Each year, the New York State Department of Health sends a memorandum to LTCFs and other institutions recommending vaccination of residents, use of rapid-antigen testing during outbreaks of ILI, and rapid implementation of ACIP-recommended outbreak-control measures if influenza is confirmed (3).

From October 30, 1997, through February 17, 1998, a total of 213 (33%) of 650 LTCFs in New York state reported laboratory-confirmed influenza A by rapid-antigen test or culture, representing a 245% increase over the 87 laboratory-confirmed influenza A outbreaks reported during the 1996–1997 influenza season. Of 47 facilities from which complete data were available, all reported prophylactic use of amantadine/rimantadine, and the median ILI attack rate was 12% (range 2%–49%).

On January 7, 1998, a LTCF in Westchester County reported a severe outbreak of ILI. The facility has 180 day-shift staff and 270 residents in six units. On December 24, 1997, respiratory specimens were analyzed by a rapid immunofluorescent antibody test and were negative for influenza. However, on January 7, 1998, two specimens cultured at the state laboratory were positive for influenza A(H3N2). One isolate was further characterized at CDC as A/Sydney/05/97(H3N2)-like. Although rimantadine prophylaxis was administered to eligible residents on January 7, 1998, the outbreak had already peaked. From December 16, 1997, through January 7, 1998, a total of 59 (22%) of 264 vaccinated residents and one (17%) of six unvaccinated residents developed ILI (VE=-34% [95% CI=-71%–78%]). Four (2%) vaccinated residents and one (17%) unvaccinated resident died of influenza-related complications (VE=91% [95% CI=30%–98%]). Among the staff, 172 (96%) of 180 day-shift staff persons completed a self-administered questionnaire, 18 (30%) of 60 vaccinated and 36 (32%) of 111 unvaccinated persons developed ILI (VE=7.5% [95% CI=-48%–42%]).

**Virginia**

During the 1997–98 influenza season, the Virginia Department of Health (VDH) conducted active surveillance for outbreaks of ILI in LTCFs and recommended that LTCFs

*Influenza Activity — Continued*

confirm influenza using rapid-antigen tests provided by the state laboratory and implement ACIP-recommended outbreak-control measures (3)

From January 26 through February 27, 1998, the VDH received reports of respiratory disease outbreaks from 28 (10%) of 290 licensed LTCFs. On January 26, a LTCF in Henrico County reported an outbreak of ILI. On January 31, influenza A was cultured at the state laboratory from five (71%) of seven nasopharyngeal swab specimens obtained from ill residents. Four isolates were further characterized at CDC as A/Sydney/05/97(H3N2)-like. The facility had 202 staff members and 190 residents in five units.

During January 7–31, a total of 42 (28%) of 150 vaccinated residents and 15 (38%) of 40 unvaccinated residents developed ILI (VE=25% [95% CI=-20.1%-53.6%]). Nine (6%) vaccinated residents and two (5%) unvaccinated residents died from influenza-related complications (VE=-20% [95% CI=-43.4%-7.3%]). When all deaths associated with respiratory complications during the outbreak period were included, including those not meeting the ILI case definition, 10 (7%) deaths occurred among the vaccinated and four (10%) among the unvaccinated (VE=33% [95% CI=-10.15%-77.9%]). Among the staff, 16 (16%) of 101 vaccinated persons and 18 (18%) of 101 unvaccinated persons developed ILI (VE=11% [95% CI=-6.43%-51.9%]). Outbreak control measures, including antiviral prophylaxis, were fully implemented by January 31.

**Military Base**

On January 15, 1998, an outbreak of ILI was reported among members of an Air Force squadron in Hawaii. Influenza type A was isolated at the base laboratory from four nasopharyngeal swab specimens collected from squadron members. One isolate was further characterized at CDC as A/Sydney/05/97(H3N2). Of 362 squadron members, 254 (70%) completed the questionnaire.

During January 1–30, 1998, a total of 40 (20%) of 197 vaccinated squadron members and 13 (24%) of 54 unvaccinated squadron members had ILI (VE=16% [95% CI=-46.0%-51.3%]). Median duration of illness was 6 days (range 2–14 days) among vaccinated members and 5 days (range 3–21 days) among the unvaccinated. Twenty-four (63%) of 38 vaccinated persons who had ILI and seven (54%) of 13 unvaccinated persons who had ILI and who responded to the questionnaire reported being sent home by the squadron's doctor and staying in bed because of symptoms (relative risk=1.17, 95% CI=0.7–2.1). Amantadine was not provided for prophylaxis, but was used to treat 12 cases.

*Reported by ML Cartter, MD, Coordinator, Epidemiology Program, NL Barrett, MS, Connecticut Dept of Public Health, DR Mayo, ScD, SH Egbertson, Connecticut State Laboratory, Hartford, Connecticut, D Ackman, MD, S Kondracki, G Brady, H Leib, ME Hennessy, R Gallo, L Grady, PhD, P Smith, MD, State Epidemiologist, New York State Dept of Health, S Jenkins, VMD, Acting State Epidemiologist, D Woolard, PhD, M Linn, MURP, E Barrett, DMD, J Rullan, MD, Office of Epidemiology, Virginia Dept of Health, J Pearson, DrPH, B Meisel, Virginia Div of Consolidated Laboratory Svcs, C Thorpe, MD, P Young, Henrico Health District, BG Regier, LLM, S Jones, MD, P Gershonoff, V Altman, Henrico County long-term care facility, Richmond, Virginia, N Anderson, Univ of Michigan, Ann Arbor, HJ Beecham III, MD, AJ Yund, MD, Navy Environmental and Preventive Medicine Unit No. 6, MB Weigner, MD, J Herbst, BS Wiseman, Navy Medical Clinic, Pearl Harbor, Hawaii, LC Canas, Project Gargle, Brooks Air Force Base, San Antonio, Texas. Participating state and territorial epidemiologists and state public health laboratory directors, World Health Organization collaborating laboratories, State Br, Epidemiology Program Office, Influenza Br, Div of Viral and Rickettsial Diseases, National Center for Infectious Diseases, CDC.*

*Influenza Activity — Continued*

**Editorial Note** Both the 1996–97 and the 1997–98 seasons have been dominated by influenza A(H3N2) viruses and characterized by sustained elevations in P&I-related excess deaths. The predominant A(H3N2) strains identified in the United States during the 1997–98 season have been A/Sydney/05/97(H3N2)-like, which are variants of the strain contained in the 1997–98 vaccine. Although influenza outbreaks among all age groups have been reported to CDC, most have been reported in elderly nursing home residents.

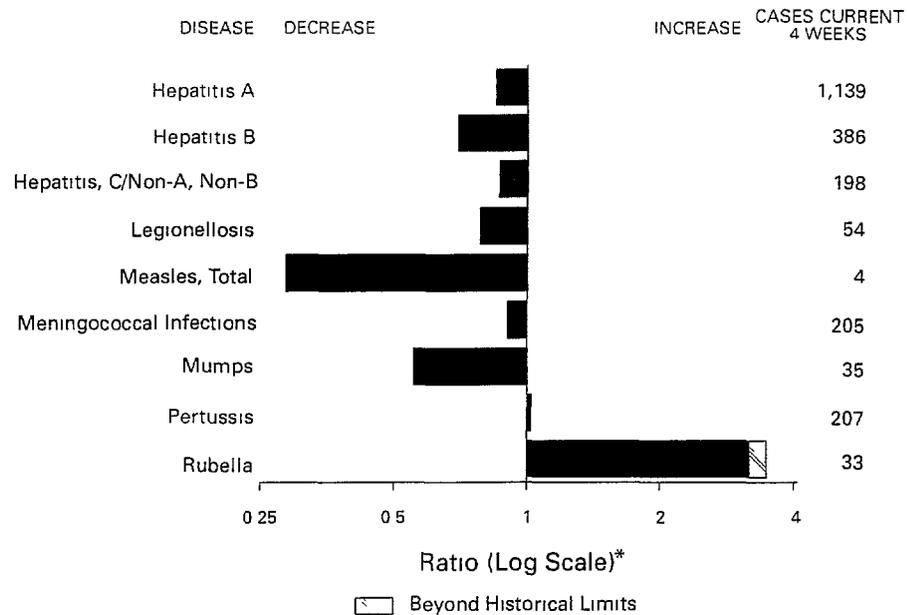
The outbreak investigations reported here all were associated with A/Sydney/05/97(H3N2)-like viruses and suggest that protection provided by the current vaccine against illness caused by this variant strain may have been low. This is consistent with previous reports with variant strains (4–6). In the outbreaks in Connecticut and New York, influenza vaccination appeared to reduce death rates, even when it failed to prevent ILI. Although the reduced risk was statistically significant in only one of the outbreaks, this also is consistent with previous studies (3,5–8) and underscores the importance of vaccinating persons at high risk for influenza-related complications and death even in years when the match between vaccine and circulating strain is not optimal (3). The timely implementation of outbreak control measures within institutions, including vaccination of residents, reduced contact between ill and non-ill persons, and antiviral prophylaxis of all non-ill persons and antiviral treatment of ill persons when the outbreak is caused by influenza type A, may reduce morbidity and mortality (3).

Throughout the influenza season, surveillance data collected by CDC are updated weekly and are available through the CDC voice information system, telephone (888) 232-3228, or the fax information system, telephone (888) 232-3299, by requesting document number 361100, or through CDC's Influenza Branch, Division of Viral and Rickettsial Diseases, National Center for Infectious Diseases World-Wide Web site <http://www.cdc.gov/ncidod/diseases/flu/weekly.htm>. Information about local influenza activity is available from many county and state health departments.

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**FIGURE I Selected notifiable disease reports, comparison of provisional 4-week totals ending March 14, 1998, with historical data — United States**



\*Ratio of current 4-week total to mean of 15 4-week totals (from previous, comparable, and subsequent 4-week periods for the past 5 years) The point where the hatched area begins is based on the mean and two standard deviations of these 4-week totals

**TABLE I Summary — provisional cases of selected notifiable diseases, United States, cumulative, week ending March 14, 1998 (10th Week)**

	Cum 1998		Cum 1998
Anthrax		Plague	
Brucellosis	3	Poliomyelitis paralytic <sup>†</sup>	7
Cholera		Psittacosis	
Congenital rubella syndrome		Rabies human	
Cryptosporidiosis*	286	Rocky Mountain spotted fever (RMSF)	13
Diphtheria		Streptococcal disease invasive Group A	369
Encephalitis California*		Streptococcal toxic shock syndrome*	15
eastern equine*		Syphilis congenital**	5
St Louis*		Tetanus	1
western equine*		Toxic shock syndrome	20
Hansen Disease	20	Trichinosis	1
Hantavirus pulmonary syndrome**†		Typhoid fever	45
Hemolytic uremic syndrome post diarrheal*	1	Yellow fever	
HIV infection pediatric* <sup>‡</sup>	39		

no reported cases  
 \*Not notifiable in all states  
<sup>†</sup> Updated weekly from reports to the Division of Viral and Rickettsial Diseases National Center for Infectious Diseases (NCID)  
<sup>‡</sup> Updated monthly to the Division of HIV/AIDS Prevention-Surveillance and Epidemiology National Center for HIV STD and TB Prevention (NCHSTP) last update February 22, 1998  
<sup>¶</sup> One suspected case of polio with onset in 1998 has also been reported to date  
 \*\*Updated from reports to the Division of STD Prevention NCHSTP

**TABLE II Provisional cases of selected notifiable diseases, United States, weeks ending March 14, 1998, and March 8, 1997 (10th Week)**

Reporting Area	AIDS		Chlamydia		Escherichia coli O157 H7		Gonorrhea		Hepatitis C/NA NB	
	Cum 1998*	Cum 1997	Cum 1998	Cum 1997	NETSS <sup>†</sup>	PHLIS <sup>‡</sup>	Cum 1998	Cum 1997	Cum 1998	Cum 1997
					Cum 1998	Cum 1998				
UNITED STATES	7 421	10 995	81 080	81 773	137	45	51 457	53 265	530	512
NEW ENGLAND	202	259	3 577	3,315	19	8	999	1 170	5	11
Maine	4	16	195	161			9	8		
N H	11	2	160	154	5	2	22	40		2
Vt	8	10	60	79			1	10		
Mass	73	122	1 638	1 351	10	6	431	457	5	9
RI	21	29	476	402	1		62	112		
Conn	85	80	1 048	1 168	3		474	543		
MID ATLANTIC	2 112	3 537	11 050	10 655	8	1	6 426	6 796	64	38
Upstate N Y	299	541	N	N	8		718	1 089	59	27
N Y City	1 160	1 785	6 767	5 729		1	3 185	2 790		
N J	287	776	810	2 025			717	1 393		
Pa	366	435	3 473	2 901	N		1 806	1 524	5	11
E N CENTRAL	512	727	15 840	13 175	23	7	11 090	8 546	86	133
Ohio	93	167	4,849	4 099	8		2 973	2 790	5	5
Ind	81	87	1 741	1 674	5	3	1 156	1 201	2	1
Ill	249	250	4 402	2 053	9		3 475	1 108	4	21
Mich	57	178	4 025	3 217	1		3 161	2 557	75	106
Wis	32	45	823	2 132	N	4	325	890		
W N CENTRAL	152	264	5 434	5 909	11	6	2 134	2 511	71	24
Minn	22	38	1 041	1 407	3	2	366	461		
Iowa	9	45	731	999	1		199	239	5	3
Mo	76	140	1 624	2 036	1	3	791	1 316	66	16
N Dak	3	2	20	189	1	1	4	14		1
S Dak	5	2	338	188			59	28		
Nebr	15	20	537	269	3		193	86		
Kans	22	17	1 143	821	2		522	367		
S ATLANTIC	1 890	2 791	19 347	15,626	20	6	16 146	16 289	31	43
Del	36	38	445				287	205		
Md	239	316	1 493	1 180	9	4	1 571	2 408	2	5
D C	192	192	N	N			682	889		
Va	114	245	2 248	2 202	N	2	1 472	1 704	1	4
W Va	19	17	597	649	N		161	206	2	1
N C	107	153	4 072	3,519	6		3 581	3 122	7	16
S C	129	156	3 505	2 313	1		2 345	2 296		12
Ga	229	374	3 804	1 444	2		3 432	2 340	6	
Fla	825	1 300	3 183	4 319	2		2 615	3 119	13	5
E S CENTRAL	291	318	6 746	6 066	7	3	6 619	6 456	15	58
Ky	39	32	1 194	1 179	2		738	823		1
Tenn	107	135	2 596	2 171	3	3	2 269	1 930	12	24
Ala	86	89	2 023	1 530	2		2 566	2 223	3	4
Miss	59	62	933	1 186			1 046	1 480		29
W S CENTRAL	896	942	4 813	9 172	1		4 174	6 537	8	40
Ark	33	41	718	532			1 184	860		1
La	153	169	2 383	1 154			2 079	1 230		28
Okla	52	47	1 712	1 039	1		911	824		
Tex	658	685		6 447				3 623		
MOUNTAIN	205	314	3 568	4 260	12	5	1 349	1 481	131	57
Mont	9	8	175	126			8	9	4	3
Idaho	5	4	352	297	2		30	21	33	12
Wyo		5	157	91			9	10	60	19
Colo	39	96		408	2	1	516	399	7	7
N Mex	38	26	819	797	3	2	151	283	12	8
Ariz	60	71	1 710	1 758	N	2	562	578		5
Utah	26	23	215	248	3		25	33	8	1
Nev	28	81	140	535	2		48	148	7	2
PACIFIC	1 161	1 843	10 705	13 595	36	9	2 520	3 479	119	108
Wash	77	92	2 152	1 742	10	3	369	423	2	5
Oreg	31	74	456	902	9	2	78	128	1	1
Calif	1 038	1 651	7 393	10 439	17	3	1 946	2 734	81	65
Alaska		16	368	261			56	113	1	
Hawaii	15	10	336	251	N	1	71	81	34	37
Guam			8	65	N		2	9		
PR	273	264	U	U	1	U	68	112	1	11
VI	8	11	N	N		U				
Amer Samoa					N	U				
C N M I			N	N	N	U	7	7		2

N Not notifiable U Unavailable no reported cases C N M I Commonwealth of Northern Mariana Islands

\*Updated monthly to the Division of HIV/AIDS Prevention—Surveillance and Epidemiology National Center for HIV STD and TB Prevention last update February 22 1998

<sup>†</sup>National Electronic Telecommunications System for Surveillance

<sup>‡</sup>Public Health Laboratory Information System

**TABLE II (Cont'd) Provisional cases of selected notifiable diseases, United States, weeks ending March 14, 1998, and March 8, 1997 (10th Week)**

Reporting Area	Legionellosis		Lyme Disease		Malaria		Syphilis (Primary & Secondary)		Tuberculosis		Rabies Animal
	Cum 1998	Cum 1997	Cum 1998	Cum 1997	Cum 1998	Cum 1997	Cum 1998	Cum 1997	Cum 1998*	Cum 1997	Cum 1998
UNITED STATES	165	165	575	600	167	243	1 188	1 697	893	2 446	1 135
NEW ENGLAND	7	12	65	118	5	7	13	27	36	59	210
Maine		1							U	5	28
NH	1	2	4	4		1			2	1	21
Vt		2		2					1		5
Mass	3	4	21	21	5	5	12	15	25	28	59
RI	3		13	12		1			8	5	18
Conn		3	27	79			1	12	U	20	79
MID ATLANTIC	35	30	378	400	50	59	45	74	75	349	291
Upstate NY	10	6	200	31	18	5	2	12	U	40	187
NY City	3	1		23	25	35	7	14	U	189	U
NJ		5		102		15	10	33	75	79	41
Pa	22	18	178	244	7	4	26	15	U	41	63
E N CENTRAL	46	64	19	4	9	23	183	156	48	311	8
Ohio	22	33	18	1	1	1	38	51	5	61	8
Ind	4	6	1	2	1	2	39	36	U	23	
Ill	3	2		1	1	10	60	16	43	176	
Mich	14	20			6		8	22	U	33	
Wis	3	3	U	U		2	8	31	U	18	
W N CENTRAL	13	12	4	1	3	3	20	35	32	64	85
Minn					1			9	U	21	14
Iowa			4		1	1		1	U	8	22
Mo	8	6			1	2	10	14	28	24	4
N Dak									U	2	22
S Dak									4	1	14
Nebr	5	4		1			4				
Kans		2					6	11	U	8	9
S ATLANTIC	36	19	83	56	48	50	516	666	182	355	437
Del	4	2		10	1	2	5	3		7	
Md	7	10	75	37	18	18	117	193	44	31	107
DC	2	1	3	4	3	4	14	25	19	15	
Va	4				4	11	41	53	30	40	113
W Va	N	N							16	7	10
NC	4	3		2	5	2	150	132	73	53	103
SC	3	1		1	3	3	54	88	U	30	19
Ga			2	1	10	8	87	124	U	60	36
Fla	12	2	3	1	7	2	48	48	U	112	49
E S CENTRAL	2	7	9	14	4	5	230	376		181	35
Ky				1		1	25	26	U	26	5
Tenn	2	2	5	2	3	1	127	154	U	57	18
Ala		2	4		1	1	54	95	U	73	12
Miss		3		11		2	24	101	U	25	
W S CENTRAL		1		1	3	3	111	268	12	370	35
Ark					1	1	29	41	12	20	1
La					3	2	72	100		14	
Okla		1					10	25	U	31	34
Tex				1				102	U	305	
MOUNTAIN	11	12	1		12	13	40	34	42	67	17
Mont	1					1			2	2	5
Idaho					1				1		
Wyo		1				1			1	1	12
Colo	4	3			4	6	3		U	10	
N Mex	1				4	2			7	2	
Ariz		3			2		34	29	23	32	
Utah	4	4			1		2	1	8	1	
Nev	1	1	1			3	1	4	U	19	
PACIFIC	15	8	16	6	33	80	30	61	466	690	17
Wash		1					4	3	U	47	
Oreg				2	6	4	1	1	U	22	
Calif	15	6	16	4	27	76	25	57	439	566	11
Alaska									8	19	6
Hawaii		1							19	36	
Guam								2		11	
PR						2	56	43			15
VI											
Amer Samoa											
C N M I							1	1	8		

N Not notifiable U Unavailable no reported cases

\*Additional information about areas displaying U (e.g Tuberculosis) can be found in Notices to Readers MMWR Vol 47 No 2 p 39

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**TABLE III Provisional cases of selected notifiable diseases preventable by vaccination, United States, weeks ending March 14, 1998, and March 8, 1997 (10th Week)**

Reporting Area	<i>H influenzae</i> invasive		Hepatitis (Viral) by type				Measles (Rubeola)					
	Cum 1998*	Cum 1997	A		B		Indigenous		Imported†		Total	
			Cum 1998	Cum 1997	Cum 1998	Cum 1997	1998	Cum 1998	1998	Cum 1998	Cum 1998	Cum 1997
UNITED STATES	193	223	3 069	4 794	1 138	1 469		1	2	5	6	13
NEW ENGLAND	9	13	65	106	9	36				1	1	
Maine		2	9	3		2						
N H	1	2	4	6	3	2						
Vt			4	4		1						
Mass	8	8	11	57	4	21				1	1	
R I		1	5	4	2	2						
Conn			32	32		8						
MID ATLANTIC	29	32	150	411	156	255						5
Upstate N Y	12	1	62	17	55	33						3
N Y City	5	14	38	225	35	108						1
N J	12	11	2	65		53						1
Pa		6	48	104	66	61						
E N CENTRAL	31	38	448	538	141	246				1	1	2
Ohio	17	18	80	95	16	18						
Ind	2	4	53	54	13	25						
Ill	11	11	46	189	10	73						
Mich		4	251	158	98	113				1	1	1
Wis	1	1	18	42	4	17						
W N CENTRAL		5	301	331	68	105						
Minn		2	5	1	2							
Iowa		1	130	42	11	6						
Mo		2	145	210	49	88	U		U			
N Dak			1	3	1							
S Dak			1	5	1							
Nebr			8	14	2	4						
Kans			11	56	2	7	U		U			
S ATLANTIC	60	36	338	299	189	154		1	2	3	4	
Del				7		1						
Md	13	15	77	84	26	33		-		1	1	
D C			11	9	3	13						
Va	6	2	42	33	16	16			2	2	2	
W Va	1	2		3	1	4						
N C	7	7	18	47	49	33						
S C	-	3	7	18		8			-			
Ga	15	4	82	36	43	12						
Fla	18	3	101	62	51	34		1			1	
E S CENTRAL	7	14	84	124	87	115						1
Ky		1		22		6						
Tenn	7	8	56	54	69	73						
Ala		5	28	29	18	15						1
Miss				19		21	U		U			
W S CENTRAL	11	9	201	672	64	76						
Ark		1	9	42	15	11						
La	5	1	4	25	4	9						
Okla	5	6	90	310	7	4						
Tex	1	1	98	295	38	52						
MOUNTAIN	31	24	642	776	148	162						
Mont			6	30	1	1						
Idaho			43	38	4	6						
Wyo			12	8	2	5						
Colo	5	5	52	95	17	39						
N Mex		1	38	60	54	55						
Ariz	20	9	416	299	39	29						
Utah	2	2	37	181	16	15						
Nev	4	7	38	65	15	12						
PACIFIC	15	52	840	1 537	276	320						5
Wash	1		100	94	21	10						
Oreg	12	8	62	86	21	24						
Calif		41	670	1 314	229	277						2
Alaska	1	1	1	8	2	5						
Hawaii	1	2	7	35	3	4						3
Guam						1	U		U			
PR			3	59	90	181						
VI							U		U			
Amer Samoa							U		U			
CN MI		2		1	7	11	U		U			1

N Not notifiable U Unavailable no reported cases

\*Of 41 cases among children aged <5 years serotype was reported for 13 and of those 6 were type b

†For imported measles, cases include only those resulting from importation from other countries

**TABLE III (Cont'd) Provisional cases of selected notifiable diseases preventable by vaccination, United States, weeks ending March 14, 1998, and March 8, 1997 (10th Week)**

Reporting Area	Meningococcal Disease		Mumps			Pertussis			Rubella		
	Cum 1998	Cum 1997	1998	Cum 1998	Cum 1997	1998	Cum 1998	Cum 1997	1998	Cum 1998	Cum 1997
UNITED STATES	607	834	10	73	98	45	619	881	2	57	6
NEW ENGLAND	37	53			3	7	130	282		9	
Maine	3	5					4	6			
N H	1	5				1	12	34			
Vt	1	2					19	91			
Mass	16	34			1	6	92	141			
R I	3	1			1			9			
Conn	13	6			1		3	1		9	
MID ATLANTIC	42	71		2	12	7	54	56	2	39	2
Upstate N Y	16	14		2	2	7	54	23	2	39	
N Y City	7	15			1			15			2
N J	19	15			2			5			
Pa		27			7			13			
E N CENTRAL	103	104	1	10	10	4	62	94			3
Ohio	47	39	1	7	3	2	33	42			
Ind	18	10			2		4	2			
Ill	17	34			2	2	3	12	-		
Mich	12	8		3	2		14	18			
Wis	9	13			1		8	20			3
W N CENTRAL	42	66	2	7	4	2	46	38			
Minn		2		4	2		28	25			
Iowa	8	12	1	2	2	2	11	6			
Mo	21	37	U			U	5		U		
N Dak			1	1				1			
S Dak	4	3						1			
Nebr	1	3					2	2			
Kans	8	9	U			U		3	U		
S ATLANTIC	127	155		15	11	1	56	83		2	
Del	1	3									
Md	14	18		2			9	47			
D C		4						2			
Va	12	9		2	1			13			
W Va	3	5						3			
N C	18	31		5	4		30	10		1	
S C	13	31		3	1		5	4		1	
Ga	35	21			2		2	2			
Fla	31	33		3	3	1	12	2			
E S CENTRAL	22	68			8		13	25			
Ky		14						8			
Tenn	22	25			3		4	5			
Ala		22			2		9	7			
Miss		7	U		3	U		5	U		
W S CENTRAL	35	59	3	14	8	1	19	13		2	
Ark	7	12				1	9	2			
La	12	13			-			2			
Okla	16	8									
Tex		26	3	14	8		10	9		2	
MOUNTAIN	45	51		4	6	16	176	160		5	
Mont	2	4					1				
Idaho	2	4			1	7	100	92			
Wyo	3			1				3			
Colo	11	8			2	3	17	50			
N Mex	7	11	N	N	N	2	41	8		1	
Ariz	17	12		1		3	9	6		1	
Utah	2	6			1		5			2	
Nev	1	6		2	2	1	3	1		1	
PACIFIC	154	207	4	21	36	7	63	130			1
Wash	20	18	1	2	3	7	54	42			
Oreg	32	51	N	N	N		8	4			
Calif	99	136	2	11	27			78			1
Alaska	1			2	1			2			
Hawaii	2	2	1	6	5		1	4			
Guam		1	U		1	U			U		
PR		4			3						
VI			U			U			U		
Amer Samoa			U			U			U		
C N M I			U			U			U		

N Not notifiable    U Unavailable    no reported cases

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TABLE IV Deaths in 122 U S cities,\* week ending  
March 14, 1998 (10th Week)

Reporting Area	All Causes By Age (Years)						P&I <sup>1</sup> Total	Reporting Area	All Causes By Age (Years)						P&I <sup>1</sup> Total
	All Ages	>65	45-64	25-44	1-24	<1			All Ages	>65	45-64	25-44	1-24	<1	
NEW ENGLAND	564	408	94	37	14	11	56	S ATLANTIC	1 221	811	234	119	27	28	49
Boston Mass	152	94	34	11	8	5	16	Atlanta Ga	U	U	U	U	U	U	U
Bridgeport Conn	34	26	6	2			4	Baltimore Md	259	159	55	28	9	7	22
Cambridge Mass	9	9					1	Charlotte N C	124	82	25	10	2	5	5
Fall River Mass	21	17	1	3				Jacksonville Fla	163	112	28	19	2	2	4
Hartford, Conn	48	38	7	1	1	1		Miami Fla	116	77	22	13	1	2	2
Lowell, Mass	24	17	6	1			3	Norfolk Va	80	49	16	10	1	4	1
Lynn Mass	14	7	5	2			1	Richmond Va	84	61	19	4			
New Bedford Mass	25	22	2	1			2	Savannah Ga	55	30	17	6	2	1	1
New Haven Conn	35	25	4	3	1	2	6	St Petersburg Fla	39	30	3	3	2	1	2
Providence R I	70	50	11	6	2	1	5	Tampa Fla	210	144	35	19	7	5	12
Somerville Mass	6	5			1			Washington D C	73	50	13	7	1	2	2
Springfield Mass	39	28	7	1	1	2	6	Wilmington Del	18	17	1				
Waterbury, Conn	32	25	5	2			3	ES CENTRAL	1 032	712	210	66	18	24	87
Worcester Mass	55	45	6	4			9	Birmingham Ala	223	162	36	14	5	5	25
MID ATLANTIC	2 231	1 606	394	162	29	40	154	Chattanooga Tenn	85	70	13	2			8
Albany N Y	40	35	2	3			3	Knoxville Tenn	90	63	21	6			11
Allentown Pa	27	20	5	2			2	Lexington Ky	63	43	12	5			3
Buffalo N Y	80	61	10	5	1	3	5	Memphis Tenn	244	153	55	18	8	10	16
Camden N J	46	30	5	6			5	Mobile Ala	97	65	21	9	2	1	2
Elizabeth N J	24	19	4	1				Montgomery Ala	69	45	15	6	2	1	11
Erie Pa	41	35	5	1			3	Nashville Tenn	161	111	37	6	1	5	11
Jersey City N J	40	29	6	3	1	1	4	W S CENTRAL	1 659	1 075	364	142	34	30	108
New York City N Y	1 126	796	219	82	10	19	61	Austin Tex	107	70	23	8	2	4	6
Newark, N J	58	31	14	11	1	1	4	Baton Rouge La	50	34	10	4	1	1	2
Paterson N J	21	14	3	3				Corpus Christi Tex	48	33	9	5			1
Philadelphia Pa	300	210	55	23	7	5	21	Dallas Tex	191	129	40	11	9	2	10
Pittsburgh Pa <sup>2</sup>	52	35	13	3	1	5	5	El Paso Tex	81	47	12	6	1	1	3
Reading Pa	31	21	5	2	2	1	3	Ft Worth Tex	106	76	22	5	3	5	
Rochester N Y	150	118	19	8	3	2	17	Houston Tex	448	252	128	48	10	10	32
Schenectady N Y	20	15	5				1	Little Rock Ark	86	58	18	8	1	1	7
Scranton Pa	28	25	2	1			1	New Orleans La	107	64	30	10	3		
Syracuse N Y	104	76	18	6	2	2	18	San Antonio Tex	240	167	42	23	4	4	17
Trenton N J	28	22	4	1	1	4		Shreveport La	76	58	11	3	2	2	10
Utica N Y	15	14	1					Tulsa Okla	119	87	19	11	1	1	14
Yonkers N Y	U	U	U	U	U	U	U	MOUNTAIN	873	604	144	70	28	27	90
E N CENTRAL	2 328	1 644	409	160	54	59	160	Albuquerque N M	89	62	13	6	3	5	1
Akron Ohio	64	43	15	2	1	3		Boise Idaho	52	43	6	3			6
Canton Ohio	36	30	3	2	1		2	Colorado Springs Colo	51	39	9	2			1
Chicago Ill	499	336	76	46	24	16	42	Denver Colo	U	U	U	U	U	U	U
Cincinnati Ohio	138	96	27	10	5	17		Las Vegas Nev	213	148	42	14	5	4	18
Cleveland Ohio	169	114	33	12	4	6	8	Ogden Utah	21	13	4	3			3
Columbus Ohio	199	141	37	11	4	6	18	Phoenix Ariz	166	106	33	15	8	4	19
Dayton Ohio	114	81	26	4	1	2	6	Pueblo Colo	21	16	4	1			5
Detroit Mich	243	149	55	34	3	2	14	Salt Lake City Utah	131	89	15	14	8	5	15
Evansville Ind	35	24	9	1	1		2	Tucson Ariz	129	88	18	12	4	7	17
Fort Wayne Ind	69	52	14	2	1		6	PACIFIC	2 163	1 593	330	150	52	37	243
Gary Ind	20	13	6	1				Berkeley Calif	15	10	1	1	1	2	2
Grand Rapids Mich	71	51	12	3	5		3	Fresno Calif	140	96	18	10	6	10	10
Indianapolis Ind	200	139	27	21	3	10		Glendale Calif	39	31	3	4			7
Lansing Mich	45	36	7	2			6	Honolulu Hawaii	82	62	9	6	2	3	3
Milwaukee Wis	110	82	20	3	2	3	13	Long Beach Calif	51	40	7	2	1	1	10
Peoria Ill	38	29	4	1	4	7		Los Angeles Calif	717	533	113	49	17	5	89
Rockford Ill	42	36	3		2	1	3	Pasadena Calif	21	13	4	1			3
South Bend Ind	61	48	8	3	1	1		Portland Ore	149	112	27	7	2	1	12
Toledo Ohio	117	97	17	1	2		9	Sacramento Calif	205	143	38	11	9	3	33
Youngstown Ohio	58	47	10	1			3	San Diego Calif	162	116	30	12	2	2	21
W N CENTRAL	776	579	126	44	11	16	60	San Francisco Calif	103	72	9	15	4	3	16
Des Moines Iowa	139	104	22	7	3	3	20	San Jose, Calif	151	112	24	12	3		13
Duluth Minn	21	14	4	2	1	1		Santa Cruz Calif	41	29	9	3			5
Kansas City Kans	37	18	9	7	1	2	1	Seattle Wash	133	100	19	10	2	2	1
Kansas City Mo	86	64	13	8	1	5		Spokane Wash	56	48	5	3			10
Lincoln Nebr	29	21	5	1	2	3		Tacoma Wash	98	76	14	4	3	1	10
Minneapolis Minn	172	132	31	5	1	3	16	TOTAL	12 847 <sup>1</sup>	9 032	2 305	950	267	272	1 007
Omaha, Nebr	67	54	9	3	1	5									
St Louis Mo	68	46	15	2	3	2									
St Paul Minn	76	61	9	5	1		5								
Wichita Kans	81	65	9	4		3	4								

U Unavailable no reported cases

\*Mortality data in this table are voluntarily reported from 122 cities in the United States most of which have populations of 100 000 or more A death is reported by the place of its occurrence and by the week that the death certificate was filed Fetal deaths are not included

<sup>1</sup>Pneumonia and influenza

<sup>2</sup>Because of changes in reporting methods in this Pennsylvania city these numbers are partial counts for the current week Complete counts will be available in 4 to 6 weeks

<sup>3</sup>Total includes unknown ages

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