

# EPI Newsletter

## Expanded Program on Immunization in the Americas

Volume XVI, Number 6 **IMMUNIZE AND PROTECT YOUR CHILDREN**

December 1994

### Summary of Caribbean Managers Meeting

The Eleventh Meeting of the Caribbean EPI Managers was held in Nassau, Bahamas, from 14-18 November 1994. Throughout the meeting, various points of achievement were noted. These included the fact that no cases of indigenous measles have been reported in over 3 years in the Caribbean, despite intensified surveillance for measles with nearly 600 units reporting each week in the English speaking Caribbean and Suriname. Also, nearly 12 years have elapsed since a reported case of paralytic poliomyelitis was detected in the Caribbean. Remarkable progress has been achieved in surveillance of fever and rash illnesses and immunization coverage levels remain high throughout the Caribbean and the Americas.

The Meeting was attended by over 80 participants from the 19 countries of the English speaking Caribbean and Suriname; representatives of the French Departments of Guadeloupe and French Guyana, as well as from Curaçao and St. Maarten also attended the meeting. For the first time, and following recommendations of previous meetings, representatives from Puerto Rico attended the event. Several NGOs, including Rotary International and the Christian Children's Fund were also in attendance. Technical personnel from PAHO and its Caribbean Epidemiology Center, UNICEF, and CPHA, were active participants in the Meeting as well.

An extraordinary level of commitment was clearly evidenced by the high quality of presentations and by 100% participation of member countries. Governmental commitment was evidenced by allocation of resources which have accounted for approximately 90% of the cost of the program over the last few years, as well as personal involvement of political leaders in support of the program.

The role of international supporting agencies was noted as an important factor in the progress achieved thus far and their continued support will be fundamental for further gains.

The principal purpose of the Meeting was to review the overall EPI program in the Caribbean and to identify obstacles which might impede achieving program targets. To assist in this identification, country reports and the 1994 National Work Plans were reviewed and analyzed. This exercise resulted in the elaboration of the 1995 National Work Plans.

Another major objective of the Meeting was to evaluate continued efforts towards the elimination of measles by 1995, focusing on various limitations related to surveillance of suspected measles cases and incomplete laboratory specimen collections. The key issue of the continued build up of susceptibles was addressed, with each country determining the number of potential susceptibles in their country, and whether a catch-up vaccination campaign was necessary. Also addressed were issues pertaining to the maintenance of the absence of wild poliovirus transmission in the region.

#### Surveillance

The continued implementation of and improvements in the surveillance system for detection of suspected measles cases was evidenced by improved weekly reporting and training in operational procedures related to surveillance and case investigation. The meeting stressed the critical role that CAREC should play in helping to strengthen the surveillance of vaccine preventable diseases in the Caribbean, both in terms of organization and maintenance of the reporting networks, and analysis of the data to allow for refining strategies for disease control and elimination.

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It was noted that a great number of measles epidemiological investigation forms are not being sent to CAREC. This has greatly impeded the analysis and evaluation of data for the entire Caribbean. Without such data it is difficult to assess trends and make group policy and strategy decisions. Nevertheless, based upon data available collected and analyzed from laboratory forms, a number of indicators related to the laboratory results were presented. These included the fact that for the period January to October, 1994, a total of 187 out of 220 (94%) of suspected cases had an S1 sample obtained and submitted to CAREC. (4 of the 33 which were without specimens were cases which did not require an S1, such as cases incorrectly reported as suspected.) Of the 187 S1, 114 (60%) had S2 submitted and of the other 73 S1, 27 were without specimens due to cases not requiring an S2, for example, confirmed rubella diagnosis with S1. Also, the interval between rash onset and collection of S1 was under 8 days in over 85% of cases. 50% of all S1 specimens taken were received within a two week period at the reference laboratory. Over 40% took longer than 3 weeks to have specimens received in CAREC. 50% of S2 was collected within 2 weeks after collection of S1.

It is important to note that in some countries the private medical practitioners (PMD) are not yet fully incorporated in the system, additional efforts should be made to achieve this objective. In a region that is apparently free from indigenous transmission and with a very heavy influx of outside tourists, it is likely that cases of fever and rash illnesses would first be seen by a private medical practitioner, therefore the importance of their participation in the system. Some countries are having very good progress incorporating the PMD, the key to their success has been good coordination, training and permanent contact and feed back.

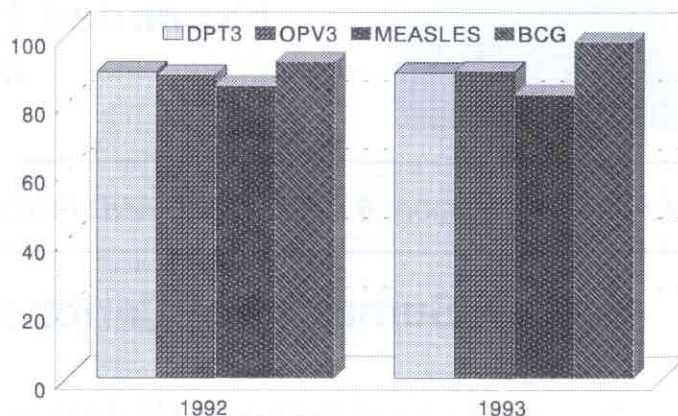
Another aspect that merits action is evaluation of the surveillance system with respect to the ZERO reporting. It is crucial that ZERO actually reflect the absence of suspected measles cases and not the routine submission of a negative report.

### Coverage and Susceptibles

Overall, immunization coverage has been maintained at the previous high levels already achieved. (See Figure 1) However, it was reported by some countries that coverage had either dropped or remained stationary under the 90% mark. When coverage is less than 95%, this indicates that there are considerable numbers of unvaccinated children.

Despite improved coverage a yearly increase of approximately 30,000 susceptibles are likely to be added to this total (from each new birth cohort, those not vaccinated and those that represent vaccine failures). Such a number of susceptibles are more than sufficient to support a considerably large epidemic should a measles introduction occur. This estimate does not include an unknown number of susceptibles in the greater than 4 years of age sector of the population.

**Figure 1: Vaccination Coverage EPI Vaccines, 1992 - 1993 English-Speaking Caribbean and Suriname**



Source: Ministries of Health - 1994

With the above background information, each country estimated the number of likely susceptibles in the <5 population. It was determined that if there was an average of 20% susceptibles in the birth cohort over the last 4 years, then the build up of susceptibles over a 4 year period is critical enough to warrant a catch-up campaign targeted to the under 5 age group. Countries which do not exceed this limit still need to identify smaller pockets of susceptibles, such as areas with urban poor and remote or inaccessible locales, where vaccination activities should be aggressively implemented to deal with these groups. (See Table 1)

**Table 1  
Projection of Children Under 5 Years of Age Who Would Be Susceptible to Measles by June 1995 (4 birth cohorts born since May 1991)**

Country	Annual Births	Percent Not Vaccinated	Projected Susceptible <5 Years Age*
Anguilla	159	0	96
Turks & Caicos	286	10	258
Montserrat	186	0	112
British V. I.	320	1	202
Cayman Islands	550	2	363
St. Kitts/Nevis	1000	1	630
Antigua/Barb.	1284	0	770
Bermuda	954	15	1002
Dominica	1652	7	1339
St. Vincent/Gr.	2640	9	2297
Grenada	2372	13.5	2384
St. Lucia	3690	15	3875
Belize	7781	20	9337
Bahamas	6500	9	5655
Barbados	4097	9	3564
Suriname	9000	26	12420
Guyana	21344	20	25613
Trinidad/Tob.	23000	20	27600
Jamaica	60000	20	72000
<b>TOTAL SUSCEPTIBLES</b>			<b>169517</b>

\* Projection based on a) 10% vaccine failure for 3 birth cohorts, b) percent unvaccinated for 3 birth cohorts, and c) 30% of one birth cohort (the 30% figure represents the estimated number of infants under 12 months of age which may be susceptible at any given time). The estimated total number of susceptibles is calculated as ((3 X annual births) X 0.1) + (0.3 X annual births) + ((3 X annual births) X % Unvaccinated).

An analysis of the Caribbean measles situation was made. As immunizations are given in most countries at 1 year of age, there are approximately 150,000 infants (all less than 1 year of age) at any given time unimmunized in the Caribbean. If it is assumed that approximately 30% of these infants are unprotected either by lack or loss of maternal antibody at sometime during their first year of life, this would provide up to 45,000 susceptibles at any given time in the under 1 age group. As the mass campaign provided vaccine to all persons 1 to 15 years of age in May 1991, it is likely that at that time the number of susceptibles in that age group were dramatically reduced. However, there are factors which prevent 100% of the target population from being immune; 1) vaccine is not 100% effective, 2) as coverage has been less than 100% since the campaign, there is a likely build up of additional susceptibles with each successive birth cohort, and 3) potential cold chain problems.

Based on these 3 factors one might estimate that 20% of the 1-15 age group is susceptible. For the 3 years since the campaign there have been approximately 450,000 births, and if approximately 20% are not protected, this would add up to 90,000 susceptibles. If we add this number to the 45,000 susceptibles under 1 year of age, there may be as many as 135,000 susceptibles at any given time in the Caribbean.

### **Poliomyelitis**

The International Commission for the Certification of Poliomyelitis Eradication (ICPE) concluded that the transmission of the wild Polio virus has been interrupted in the English speaking Caribbean and Suriname. In order to maintain this polio free status various recommendations were made. These included maintaining immunization levels of at least 80% at all levels, including at the district level, maintaining weekly negative reporting, continuing investigation of AFP in children under 15, and taking adequate stool samples in every case.

### **Rubella**

Confirmed Rubella cases were reported in a number of countries including Jamaica, Belize and Suriname. There is general concern to reduce the number of cases of congenital rubella syndrome (CRS) in the Caribbean. In order to achieve this, it is necessary to define the epidemiology of rubella and congenital rubella syndrome and develop an appropriate rubella vaccination strategy. Several recommendations were made regarding this issue, including the need to improve surveillance of congenital rubella syndrome through active hospital surveillance, targeting pediatricians and obstetricians who perform termination of pregnancy and services that care for children with long term sequelae of CRS such as deafness, mental retardation and heart disease. Rubella sero-surveys should be performed in selected countries among women aged 15 to 30 years to identify susceptible cohorts and rubella testing of blood

samples taken from suspected measles surveillance must be continued. Also an appropriate rubella vaccination strategy should be developed for each Caribbean country based on the pattern of susceptible age cohorts and history of rubella vaccine use.

### **Tuberculosis**

The average incidence rate for tuberculosis among CAREC Member Countries (CMCs) in 1992 was 10 per 100,000, with rates ranging from zero in three small countries to a high of 38.5 in one. Among the 987 deaths due to tuberculosis reported during the period 1979 to 1992 from the nineteen CMCs, 75% occurred among persons aged 45 years and above and only 2% occurred among children aged 5 years and under. Males accounted for 69% of tuberculosis deaths and 91% of tuberculosis deaths resulted from respiratory disease.

Two major concerns are co-infection with the HIV and the emergence of drug resistant strains of tuberculosis. The incidence rate of HIV infection is growing in the region and it is estimated that a person infected with the HIV has a 50% risk of developing active tuberculosis. The emergence of drug-resistant strains of tuberculosis in North America is of particular concern to CMCs, two of which have reported identification of tuberculosis strains resistant to at least one of the most commonly used antibiotics.

A survey of the CMCs in 1993 revealed that tuberculosis control programs in the region are generally inadequate. Surveillance activities are both limited and fragmented and diagnostic capabilities vary widely. Frequently, standards for tuberculosis treatment have not been implemented, the availability of drugs is limited, and monitoring of treatment is not routine. Thirteen of the nineteen CMCs utilize BCG vaccine in the EPI program, but two of these countries administer it at age 5 years instead of at birth as recommend by WHO.

The WHO strategy for national tuberculosis programs emphasizes six strategies. These include political commitment, staff training and supervision, cost effective diagnosis, effective chemotherapy, surveillance which focuses on case-finding and rapid follow-up and research of new approaches in service delivery, program management, treatment and prevention.

### **Social Mobilization**

Continued Social Mobilization and NGO involvement and enhanced participation are essential to the goals of the EPI, improving coverage and the maintenance of the eradication of polio and the elimination of measles. With regard to measles, social mobilization is critical to increase the population's consciousness about the need to have children of any age taken to a health authority when rash and

fever occur. To achieve this end, innovative approaches, similar to those developed in Jamaica, must be taken on a continuous basis. These include the use of media and community groups in addition to a special school program which develops materials intended to heighten the awareness of school children about the importance of immunizations.

World Health Day will be celebrated in April 1995 and will focus on progress towards global polio eradication. This is an excellent opportunity for re-vitalizing a variety of aspects related to the EPI program, including coordination between the countries and donor agencies in relation to dissemination of social communication materials for this event.

## Plan of Action

All countries have presented and discussed their 1995 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 1995 is in the order of US\$9.0 million, 83% of which will come from national budgets. Other sources of funding include PAHO, CPHA, UNICEF, and Rotary International. The funds from external agencies are being requested for some of the following areas: biological and logistics, cold chain, training, social mobilization, operating costs, supervision, surveillance, research and evaluation.

## Measles in Canada, 1994 (as of September 14)

From January 1 to September 14, 1994, a provisional total of 358 measles cases have been reported in Canada. This is 108% higher than the 172 cases reported for the same period in 1993. Over 65% (258 cases) of these cases were reported from Ontario, followed by Quebec with 25% (98 cases). No cases have been reported from Prince Edward Island, New Brunswick, the Yukon, and the Northwest Territories.

The province of Quebec recently reported two outbreaks, one of which involved a group of people who oppose immunization for religious reasons (a full report will appear in the next issue). Although several Ontario health regions have reported sporadic cases (peaking in the last week of May). A brief report follows in this issue on the latter outbreak.

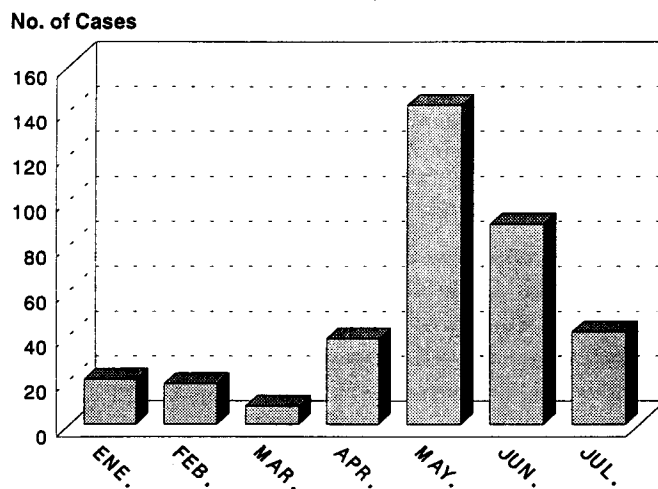
Figure 1 shows the distribution of cases by month of onset for the period January 1 to July 31, 1994. The highest number of cases (145) was recorded in May, followed by June (89 cases).

Ages of the cases ranged from 5 months to 57 years (median: 13). The highest proportion (38%) of the cases was among those aged 15 to 19 years with the greatest incidence occurring among those 16 years of age, followed by those 5 to 9 years old (22%). Infants < 1 year of age accounted for 14 cases (4%) (Figure 2). No deaths have been reported.

### Immunization Status

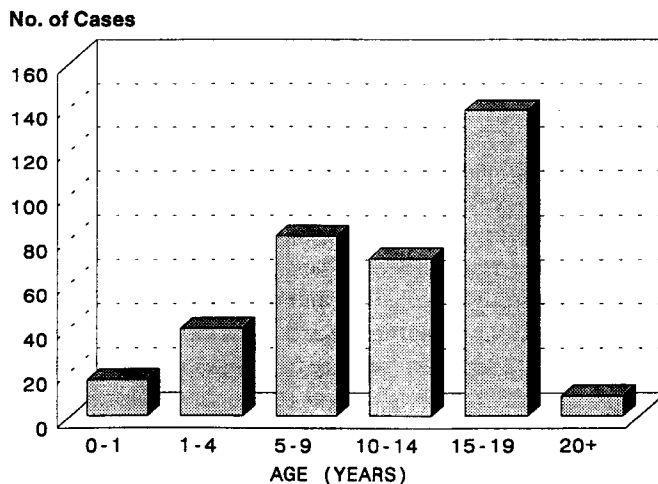
Of the 358 cases, 339 were eligible for measles vaccination, i.e., they were born after 1957 and were older than 12 months of age. Two hundred and ninety-two (86%) of this vaccine-eligible group had a documented history of immunization - a pattern expected due to the high immunization coverage of a vaccine with < 100% vaccine efficacy. Immunization history was not known for 32 of the cases (8.9%).

**Figure 1:**  
Reported cases of measles by month, Canada, January 1 to July 31, 1994\*



\*Provisional data

**Figure 2:**  
Reported cases of measles by age group, Canada January 1 to July 31, 1994\*



\*Provisional data

## Comment

*In 1994, measles activity in Canada has been characterized by sporadic cases, clusters of cases, or small outbreaks, often involving vaccinated individuals, or those not vaccinated for religious reasons. Despite these outbreaks and the potential for transmissions of the virus, the overall attack in the affected regions has still been low, suggesting that most individuals are immune. Examination of those records available indicated that, although most children were vaccinated after their first birthday, a few had received the vaccine before 12 months of age.*

## Acknowledgment

The assistance and cooperation of all provincial and territorial epidemiologists, medical officers of health and other health care personnel, as well as Ms. Carole Scott, Ms. Mary-Jane Garnett, and Mr. John Koch LCDC is greatly appreciated.

By: Paul Varughese, Childhood Immunization Division, Bureau of Communicable Disease Epidemiology, LCDC, Ottawa

Source: Measles Update August/September 1994; 2 (3): 5-6.

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## United Kingdom Launches National Measles Campaign

To prevent the occurrence of a predicted large measles epidemic in early 1995, health officials in the United Kingdom started a nationwide school-based vaccination campaign during the month of November 1994. The goal of this campaign is to provide measles, as well as rubella vaccine to all school children aged 5 to 16 years of age in the countries of the United Kingdom (England, Northern Ireland, Scotland, and Wales).

Without a measles vaccination campaign, mathematical models predicted that a large outbreak, with 100,000 to 200,000 measles cases, including up to 50 deaths would occur. The majority of cases were predicted to occur among school-aged children. Indeed, recent data suggests that approximately 14% of school-aged children may be susceptible to measles infection. Most of these susceptible children never received measles vaccine; a smaller percentage were vaccinated but, for a variety of reasons, did not become immune following vaccination. Conversely, vaccination coverage among children less than 5 years of age is over 90% and persons > 15 years of age are likely to have had clinical measles disease following exposure to circulating measles virus and are thus immune.

The primary objective of the mass campaign is to rapidly interrupt measles virus transmission among school-aged children. If this campaign is subsequently linked to a strategy that prevents the re-accumulation of pools of susceptibles, then the elimination of measles becomes a realistic prospect.

After reviewing data regarding measles surveillance, vaccination coverage, age-specific seroepidemiology, as well as the mathematical models, the U.K. Joint Committee on Vaccination and Immunization has recommended that all school children 5 to 16 years of age, regardless of previous vaccination or disease history should be vaccinated in a school based campaign.

Health officials have decided to use measles-rubella (MR) vaccine for the campaign. Rubella vaccine was

included in the campaign in order to quickly interrupt rubella transmission, which had recently been occurring among male older school-aged children and young adult males. However, there was little epidemiologic evidence to support the necessity for including the use of mumps vaccine during the campaign. Furthermore, there has been intense pressure worldwide on MMR vaccine supplies, and the Department of Health could not obtain sufficient vaccine in time to prevent the anticipated measles epidemic.

During the campaign, health officials are continuously monitoring vaccination uptake levels in all areas of the country. "Mop-up" vaccination activities will take place in areas with low vaccine coverage following the initial campaign. In addition, a special adverse event surveillance system has been established. Health practitioners have been asked to report all adverse events following vaccination in a timely manner. All adverse event reports will be investigated within 36 hours.

To monitor the impact of the vaccination campaign in reducing disease incidence, epidemiologic surveillance for cases of rubella and measles will be of great importance. However, the clinical diagnosis of both measles and rubella infections have proven to be quite unreliable, especially in young children. To improve the specificity of clinical diagnoses, the Public Health Laboratory Service has developed and tested a simple new laboratory test. This test uses the presence of measles and rubella specific IgM antibodies to confirm recent infection using a sample of saliva. The United Kingdom will be the first country in the world to use this new technique for measles and rubella surveillance.

Preliminary data as of 6 December 1994, suggest that high measles uptake is occurring throughout the country. An evaluation of the campaign is planned for early 1995.

Reported by: Dr. David Salisbury, Principal Medical Officer, Department of Health, London, England, United Kingdom

## Editorial Note:

The United Kingdom vaccination strategy is an adaptation of the measles elimination strategies recommended by PAHO and implemented by the countries of Latin America. Both include conducting national mass measles vaccination campaigns targeting susceptible children in order to quickly interrupt measles virus transmission.

The Latin American strategy has been to vaccinate all children 9 months to 14 years of age, regardless of previous measles vaccination or measles disease history. The epidemiologic situation in the United Kingdom, with a very high vaccination coverage level among pre-school-aged children, made it very reasonable to adapt the strategy to an older age group, especially when supported by serological data on measles susceptibility by age.

A sensitive and timely measles surveillance system will help health authorities to carefully monitor the situation and to make quick adjustments in the strategy and to focus control activities on eliminating any remaining pockets of transmission. The new saliva IgM test should greatly facilitate the collection of samples for the laboratory confirmation of measles clinical diagnoses, requiring only 1 sample without blood sampling. Finally, the adverse event surveillance system will provide important epidemiologic information which should be especially useful not only for the UK, but also for health planners in other countries who are considering implementation of mass measles vaccination campaigns.

The vaccination campaign in the United Kingdom required intense efforts, careful coordination and strong collaboration between the health services and the education facilities. The successful implementation of this campaign will not only serve to make both measles and rubella memories in the United Kingdom, but will also serve as a strategic template for other industrialized countries with measles elimination goals.

## Poliomyelitis Surveillance

Indicators for Evaluating Poliomyelitis Surveillance in Latin America, 1994\*

	1	2	3	4
Chile				
Colombia				
Cuba				
Ecuador				
El Salvador				
Honduras				
Mexico				
Nicaragua				
Peru				
Venezuela				
Bolivia				
Guatemala				
Paraguay				
Panama				
Argentina				
Brazil				
Costa Rica				
Dom. Rep.				
Uruguay				
Haiti				

1. 80% Weekly Reporting Units
2. 80% Investigated within 48 hours
3. 80% of Cases with 2 adequate stool samples taken
4. AFP Rate

\* Up to week 26 November

Source: EPI/PAHO (PESS)

In the continued monitoring of polio, the above figure shows the performance by country through November 26 regarding each of the four critical surveillance indicators used to determine if the countries are maintaining the necessary surveillance that will permit both the national commissions and PAHO to judge if they are polio free. The four performance indicators are: 1) weekly negative notification from at least 80% of all weekly reporting units, 2) investigation by a trained epidemiologist of at least 80% of cases of AFP within 48 hours of notification, 3) collection of two stool samples within two weeks of paralysis onset, from at least 80% of AFP cases, 4) detection of a rate of at least 1.0 cases of AFP within 48 hours of notification. Failure to meet the above criteria may indicate problems with AFP surveillance, thus increasing the risk that an introduction of wild polio virus might go undetected until an outbreak of paralytic polio occurs.

## Weekly Measles Bulletin is Launched

The EPI recently began producing a weekly measles bulletin in order to monitor the progress of measles elimination (targeted for the year 2000). The bulletin summarizes data provided from the enhanced fever and rash surveillance system being implemented in the countries of the Americas. The Rash and Fever Surveillance system facilitates the early detection and investigation of suspected measles cases, rapid enactment of control activities, and confirmation of the absence of suspected measles via negative reporting. A sensitive surveillance system such as this one

is essential to any disease control and elimination program.

The PAHO Weekly Measles Bulletin will facilitate international communication concerning regional measles situation. The bulletin is compiled by reviewing individual country reports and by summarizing sub-regional measles bulletins from Mexico, the English-speaking Caribbean and Central America. It is hoped that the information disseminated by this bulletin will increase measles awareness and promote cooperation in the eradication endeavor.

# Reported Cases of Selected Diseases

Number of reported cases of measles, poliomyelitis, tetanus, diphtheria, and whooping cough, from 1 January 1994 to date of last report, and the same epidemiological period in 1993, by country.

Subregion and country	Date of last Report	Measles				Poliomyelitis		Tetanus				Diphtheria		Whooping Cough	
		Reported		Confirmed		1994	1993	Non Neonatal		Neonatal		1994	1993	1994	1993
		1994	1993	1994	1993			1994	1993	1994	1993				
<b>LATIN AMERICA</b>															
Bolivia	25 Jun.	...	...	577	223	0	0	...	...	12	8	5	4	34	38
Colombia	03 Sep.	...	...	459	4 343	0	0	11	...	25	...	9	17	489	...
Ecuador	06 Aug.	...	...	...	...	0	0	...	...	...	...	472	...	...	...
Peru	06 Aug.	...	...	272	...	0	0	63	...	88	...	34	...	1 030	...
Venezuela	13 Aug.	...	...	11680	...	0	0	...	...	6	...	0	...	416	...
<b>Southern Cone</b>															
Argentina	09 July	316	...	44	...	0	0	1	10	3	4	2	2	247	628
Chile	18 June	83	...	0	...	0	0	1	...	0	...	0	...	20	...
Paraguay	20 Aug.	76	...	86	...	0	0	12	...	7	...	1	...	20	...
Uruguay	12 Mar.	...	...	0	5	0	0	0	1	0	0	0	0	2	0
Brazil	18 June	...	...	428	...	0	0	423	...	76	...	120	...	1 495	...
<b>Central America</b>															
Belize	27 Aug.	27	6	0	...	0	0	...	...	...	...	...	...	...	...
Costa Rica	13 Aug.	193	440	30	158	0	0	2	...	0	...	...	...	9	...
El Salvador	23 Jul.	7 913	77	0	34	0	0	8	...	4	...	0	...	6	...
Guatemala	23 Jul.	227	247	204	13	0	0	...	...	...	...	...	...	36	...
Honduras	20 Aug.	10	85	3	11	0	0	8	...	3	...	0	...	2	...
Nicaragua	23 Jul.	638	372	1	316	0	0	...	...	...	...	...	...	...	...
Panama	23 Jul.	21	227	2	90	0	0	...	1	0	1	0	0	37	8
Mexico	27 Aug.	835	...	108	106	0	0	85	103	52	65	0	0	139	118
<b>Latin Caribbean</b>															
Cuba	28 May	...	...	0	...	0	0	2	2	0	0	0	0	0	11
Haiti	...	...	...	...	...	0	0	...	...	...	...	...	...	...	...
Dominican Republic	25 June	...	...	296	1 486	0	0	...	...	4	0	1	4	9	5
<b>CARIBBEAN</b>															
Antigua & Barbuda	27 Aug.	2	0	0	0	0	0	...	1	...	...	...	...	...	...
Bahamas	27 Aug.	4	0	0	0	0	0	...	0	...	...	...	0	...	0
Barbados	27 Aug.	28	3	0	0	0	0	...	0	...	...	...	0	...	0
Dominica	27 Aug.	7	8	0	0	0	0	...	...	...	...	...	...	...	...
Grenada	27 Aug.	16	3	0	0	0	0	...	...	...	...	...	...	...	...
Guyana	27 Aug.	7	1	0	0	0	0	...	...	...	...	...	...	...	...
Jamaica	27 Aug.	58	36	0	0	0	0	...	...	...	...	...	...	...	...
St. Kitts/Nevis	27 Aug.	4	0	0	0	0	0	...	...	...	...	...	...	...	...
St. Vincent	27 Aug.	2	0	0	0	0	0	...	...	...	...	...	...	...	...
Saint Lucia	27 Aug.	16	9	0	0	0	0	...	...	...	...	...	...	...	...
Suriname	27 Aug.	12	1	0	0	0	0	...	...	...	...	...	...	...	...
Trinidad & Tobago	27 Aug.	17	2	0	0	0	0	...	6	...	0	...	0	...	2
<b>NORTH AMERICA</b>															
Canada	27 Aug.	...	...	198	154	0	0	1	6	...	0	0	4	2 302	6 777
United States	30 July	...	...	777	...	0	0	21	...	...	...	0	...	1 761	...

... Data not available.

# Weekly Measles Surveillance Bulletin

YEAR: 1994 EPIDEMIOLOGIC WEEK: 48 WEEK ENDING: 03 DECEMBER

	This week		Cumulative for the year				
	Cases Notified	Counties with outbreaks	Notified Cases	Cases Under Study	Discarded Cases	Compatible Cases	Confirmed Cases
<b>North America</b>							
Bermuda	0	---	0	0	0	0	0
Canada	---	---	495	---	---	---	495
Mexico	26	---	993	123	656	116	98
United States	11	0	874	---	---	---	874
<b>Central America</b>							
Belize	0	---	28	1	25	2	0
Costa Rica	3	0	269	25	152	92	0
El Salvador	6	0	327	82	245	0	0
Guatemala	---	---	232	4	21	3	204
Honduras	---	---	191	4	179	2	6
Nicaragua	1	0	899	127	640	131	1
Panama	0	0	65	19	44	0	2
<b>Caribbean</b>							
Anguilla	0	---	1	0	1	0	0
Antigua & Barbuda	0	---	4	0	4	0	0
Bahamas	0	---	5	1	4	0	0
Barbados	2	---	36	5	30	1	0
Cayman Islands	0	---	3	0	3	0	0
Cuba	---	---	---	---	---	---	---
Dominica	0	---	13	5	6	2	0
Dominican Republic	1	1	145	0	14	128	3
Grenada	0	---	16	0	4	12	0
Guadeloupe	---	---	---	---	---	---	---
Haiti	---	---	---	---	---	---	---
Jamaica	3	---	64	5	45	14	0
Monserrat	0	---	1	1	0	0	0

	This week		Cumulative for the year				
	Cases Notified	Counties with outbreaks	Notified Cases	Cases Under Study	Discarded Cases	Compatible Cases	Confirmed Cases
<b>Netherlands Antilles</b>							
Puerto Rico	0	0	13	---	---	---	13
St. Kitts & Nevis	---	---	4	1	3	0	0
St. Lucia	0	---	18	1	16	1	0
St. Vincent	---	---	2	0	2	0	0
Trinidad & Tobago	0	---	18	0	15	3	0
Turcs & Caicos	0	---	0	0	0	0	0
British Virgin Islands	0	---	0	0	0	0	0
U.S. Virgin Islands	0	---	0	---	---	---	0
<b>South America</b>							
Brazil	---	---	1503	569	592	306	36
French Guyana	---	---	---	---	---	---	---
Guyana	0	---	10	2	8	0	0
Suriname	---	---	15	2	13	0	0
<b>Andean Countries</b>							
Bolivia	0	---	---	---	---	---	---
Colombia	23	---	1731	225	726	260	520
Ecuador	08	---	3310	---	---	3310	---
Peru	16	---	548	---	---	548	---
Venezuela	---	---	---	---	---	---	---
<b>Southern Cone</b>							
Argentina	---	---	420	67	99	189	65
Chile	2	---	197	39	152	5	0
Paraguay	9	6	127	0	4	20	103
Uruguay	---	---	14	---	3	11	---
<b>Regional Total</b>	<b>111</b>	<b>7</b>	<b>12591</b>	<b>1308</b>	<b>3706</b>	<b>5156</b>	<b>2420</b>

--- = DATA NOT AVAILABLE

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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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