



# ***EPI Newsletter***

***Expanded Program on Immunization  
in the Americas***

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## **The Americas conquer Polio!**



**On August 23, 1991, Luis Fermin Tenorio was the last person to suffer from poliomyelitis in the Americas when at the age of two he was infected by the wild polio virus in his town Pichinaki, Peru.**

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# Americas Certified Polio Free

The International Commission for the Certification of Poliomyelitis Eradication (ICCPE) held its third meeting in Washington D.C. from 24 -25 August 1994. During this occasion they reviewed the data presented by the Presidents of the National Certification Commission that have analyzed in depth their country data on poliomyelitis and poliovirus surveillance over the last three years.

The following is the ICCPE Report which was presented by its chairman, Dr. Frederick C. Robbins:

## A. Background

1. In May 1985, the Pan American Health Organization proposed the goal of interruption of wild poliovirus transmission in the Western Hemisphere. This proposal was promptly endorsed by all member governments and received strong support from several agencies and organizations including UNICEF, the United States Agency for International Development, Rotary International, the International Development Bank, and the Canadian Public Health Association.
2. It has now been 3 years since the last confirmed case of paralytic poliomyelitis due to wild poliovirus was reported in the Americas. Several factors made it possible for the Region of the Americas to progress towards the goal of poliomyelitis eradication. These include the very high level of political commitment of the member governments, the high degree of community participation, the strong collaboration of various agencies and organizations through inter-agency coordinating committees, and the availability of well managed resources under a strong PAHO leadership.
3. In 1990, PAHO established an independent International Commission for the Certification of Poliomyelitis Eradication in the Americas (ICCPE). Their task has been to oversee the regional poliomyelitis eradication efforts and to determine when the goal has been achieved. Prior to this third meeting of the ICCPE in August 1994, previous meetings were held in July 1990 in Washington, D.C., U.S.A., and in March 1992 in Rio de Janeiro, Brazil.
4. In early 1994, each member country formed an independent National Certification Commission. Their task was to evaluate national data and to recommend to the ICCPE whether or not poliovirus transmission had been interrupted in their respective countries.
5. Information reviewed by the National Certification Commissions included trends in vaccination coverage, data obtained from an extensive region-wide surveillance system that includes over 20,000 health units that report weekly on the presence or absence of cases of acute flaccid paralysis (suspected poliomyelitis cases), and laboratory results from the testing of stool specimens obtained from suspected poliomyelitis cases and their contacts for the presence of wild poliovirus. Specimens were tested in a highly developed and proficient network of laboratories throughout the hemisphere.

## Milestone in the Eradication of Polio in the Americas

- |      |  |
|------|--|
| 1908 | Landsteiner and Popper, in Vienna, discover the polio virus.   |
| 1949 | Enders, Robbins, and Weller develop technique for growing the polio virus in tissue culture. (U.S.)  |
| 1954 | Jonas Salk undertakes large-scale field trials with inactivated vaccine.   |
| 1955 | Salk Vaccine is licensed for use in the U.S.   |
| 1960 | Albert Sabin's live oral poliomyelitis vaccine is licensed for use in the U.S.   |
| 1972 | PAHO sets forth a Ten Year Health Plan (1971-1980) for the Americas which includes the goal of polio control: less than 0.1 cases per 100,000 population.  |
| 1974 | WHO launches Expanded Program on Immunization (EPI).   |
| 1977 | PAHO establishes EPI in the Americas.  |
| 1979 | PAHO establishes EPI Revolving Fund for purchases of vaccines which allows countries to obtain good quality vaccines at low prices permitting an uninterrupted source of vaccines for country programming. |
| 1984 | 26 countries in the Americas achieve polio control. Vaccine coverage with OPV reaches almost 70% in the Region.  |
| 1985 | PAHO announces the initiative to eradicate the indigenous transmission of wild polio virus from the Americas by 1990. The initiative is supported by USAID, UNICEF, IDB, and Rotary International.         |
| 1988 | 41st World Health Assembly, following PAHO's success, sets the goal of global polio eradication by the year 2000.  |
| 1989 | PAHO recommends an increase in the amount of type III virus used in OPV based on field trials in Brazil in order to assure the elimination of type III wild virus.   |
| 1990 | PAHO helps organizes Mop-Up campaigns in all countries where wild virus is circulating.  |
| 1991 | The last case of polio due to the wild polio virus is detected in Junin, Peru.   |
| 1994 | The International Commission for the Certification of Poliomyelitis Eradication declares that the transmission of the wild poliovirus has been interrupted in the Americas.                                |



## B. Conclusions

1. During the past 6 years most countries of the region have achieved and maintained OPV3 vaccination coverage levels of over 80%. Since the last confirmed case was reported from Peru in August 1991, over 6,000 acute flaccid paralysis cases have been thoroughly investigated and none has been confirmed as paralytic poliomyelitis due to wild poliovirus. Furthermore, over 25,000 stool specimens obtained from these cases and their contacts were negative for wild poliovirus. Finally, there has been constant monitoring of key surveillance indicators, which were, with few exceptions, at acceptable levels in all countries over the last 3 years.
2. After carefully reviewing these data, all National Certification Commissions of the region have recommended that their countries be certified as being polio-free.
3. The ICCPE has carefully reviewed data that were presented by the Presidents of the National Certification Commissions. The ICCPE recognizes and applauds the extraordinary accomplishments which have been achieved by the countries of the region. Overall, the quality of the National Certification Commission reports has been excellent; they have taken their responsibilities seriously and responded in exemplary fashion.
4. Based on the impressive evidence presented, the ICCPE concludes that wild poliovirus transmission has been interrupted in the Americas.

## C. Recommendations

1. While the ICCPE is quite convinced that poliovirus transmission has been interrupted in the Americas, there remain several areas of concern. Although all National Certification Commissions have concluded that poliovirus transmission has ceased and evidence has been presented to support their conclusion, clear deficiencies exist in a few programs which should be corrected promptly. In particular, vaccination coverage needs to be increased and surveillance systems need to be strengthened in these countries. These deficiencies, if not corrected, will increase the risk for the re-establishment of wild poliovirus transmission in these countries, as well as in other countries of the region, should the virus be introduced.

Since wild poliovirus transmission still occurs in other parts of the world, the ICCPE recognizes that the Americas will remain at risk for the importation of wild poliovirus. If importations occur, the potential exists for polio outbreaks, especially in areas with low vaccine coverage and poor sanitation. Poliovirus has displayed great ingenuity in locating pockets of susceptible persons, even in countries with high levels of vaccination coverage, such as the Netherlands, Canada, and Taiwan.

2. The Region of the Americas will need to maintain high levels of vaccination coverage until the world is

certified as being polio-free. Indeed, it may be easier to eliminate poliovirus from the Americas than to maintain a polio-free status. Being the first region of the world to interrupt wild poliovirus transmission means that these efforts will need to be conducted for as long as wild poliovirus is circulating elsewhere.

3. Ongoing targeted surveillance for cases of acute flaccid paralysis and for the presence of wild poliovirus will be absolutely necessary to assure that the Region of the Americas remains polio-free. It would be tragic, if after the extraordinary efforts that have been made to free the Americas from polio, we were to let down our guard and allow the poliovirus to become established once again.
4. International communication and collaboration are necessary to assure the rapid detection and timely implementation of control efforts for importations of wild poliovirus.
5. The ICCPE strongly encourages other regions of the world to accelerate their poliomyelitis eradication activities, since only the global eradication of poliomyelitis will assure that poliovirus infection will not cause paralytic disease in the Americas or the rest of the world. The polio-free countries of the world should realize that it is very much to their benefit to do what they can to facilitate the eradication of poliovirus from polio-endemic countries.

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# The TAG and ICCPE Meet Together to review the status of polio eradication and the EPI

*The Eleventh meeting of the PAHO Technical Advisory Group (TAG) on Vaccine-Preventable Diseases and the Third meeting of the members of the International Commission for the Certification of Poliomyelitis Eradication (ICCPE) were held concurrently in Washington DC, USA, from August 22nd to August 25, 1994.*

*The following is a summary of the major highlights of this meeting*

## **POLIOMYELITIS ERADICATION: The conquest of a virus**

Three years have passed since the last case of poliomyelitis, caused by the wild poliovirus, occurred on August 23rd 1991 in Peru. This is not only an historical medical triumph, but also marks an even higher level of overall program achievement since the last TAG meeting was held in March of 1992.

The reports presented by the Presidents of the National Commissions for the Certification of Poliomyelitis Eradication showed that the fight against polio has been successful in interrupting the transmission of the wild poliovirus in their respective countries. See the report of the ICCPE in this issue.

The TAG made the following recommendations in relation to poliomyelitis:

The TAG notes with great pleasure the third anniversary of a polio-free hemisphere and looks forward to the conclusions of the International Commission for the Certification of Poliomyelitis Eradication. However, it is clear that program efforts will have to be continued in the Americas until the rest of the world has similarly interrupted transmission. Taking into account the achievements in this hemisphere, some refinements in strategy seem appropriate.

1. Immunization levels of at least 80% must be maintained and these levels must be maintained in every district. Special efforts will be needed in high risk areas such as those which had to have "mop-up" operations and those with vulnerable populations (e.g., religious groups which refuse vaccination).
2. Excellent surveillance with weekly negative reporting must be maintained and all of the existing surveillance sites should continue to be included in the system.

3. Immediate investigation of acute flaccid paralysis (AFP) in children <15 years of age must continue and every effort must be made to obtain 2 adequate specimens from every case. Stool specimens from contacts no longer need to be collected as a routine; however, they should be taken when the situation warrants, such as when adequate specimens cannot be obtained from the case or if there is increased suspicion of poliomyelitis. This change in investigation practice should enable investigators to get adequate specimens from every AFP case and also should help alleviate the burden on the laboratories, thus enabling them to maintain the highest quality performance.

4. PAHO should evaluate the pros and cons of lowering the upper age limit of the target population for AFP surveillance.

5. The reward offered for reporting a case which is subsequently confirmed to be due to indigenous wild poliovirus should be raised to \$1,000 throughout the Region and the availability of the reward should be widely publicized.

6. Studies should be undertaken to document the historical patterns of international transmission of wild poliovirus in the Americas.

## **MEASLES ELIMINATION: Is the road ready?**

Three countries in the region, Cuba, the English-speaking Caribbean, and Chile, appear to have reached and sustained transmission interruption for more than six, three, and two years respectively. Chile represents the first non-island setting where transmission has been interrupted for more than one year. In Central America the number of cases has been drastically reduced and virus circulation appears to have been interrupted in some countries. In other countries measles transmission has been reduced to a few foci where cases and limited outbreaks continue to occur. In most of these countries the surveillance system of the fever and rash diseases with laboratory diagnosis capabilities are being put into place and are reporting weekly cases.

Only Venezuela and Haiti have yet to launch their National Campaigns against Measles. Nearly 80% of children under the age of 15 in all the other countries of Latin America and the Caribbean have received a single dose of measles in the last three years.

Both the U.S. and Canada have set goals for the elimination of measles. In 1993 the U.S.A. reported historical low of 312 cases of measles (1.4/1 million). School entry laws had ensured measles vaccine coverage in school aged children over 95%.

Canada also set a goal for the elimination of indigenous measles by the year 2005. After two years, however, despite a vaccine coverage in excess of 97%, epidemics continue to occur as a result of a combination of factors. Primary vaccine failures account for the majority of these occurrences, while others mostly involve unvaccinated individuals and occur in communities with documented measles immunization coverage up to 99.7%. This evidence links most cases, then, to importation from outside the country or from one province to another.

The TAG made the following recommendations in relation to measles:

**Nearly every country in the Region has now set an elimination target for measles.** The individual country efforts could be enhanced by undertaking a regional elimination initiative. Such an initiative could help answer questions regarding surveillance of rash and fever, laboratory diagnosis, and most effective vaccination strategy(ies) to interrupt transmission. Continued efforts should be made to achieve and maintain the highest possible levels of vaccination coverage.

### **NEONATAL TETANUS : The silent enemy.**

With the exception of Chile, Costa Rica, Cuba and Uruguay, Neonatal Tetanus (NNT) is endemic throughout 15 Latin America countries. The annual number of reported cases has decreased despite improvements in surveillance systems.

The objective of the Neonatal Tetanus Elimination Program is to accelerate control by targeting the immunization of all the women of child-bearing age (WCBA) living in defined high risk districts. Out of 12,500 districts in the countries endemic for NNT, 16% (2002) have been designated as high risk areas.

In 10 countries, located in the Andean, Central and North American Subregions, 41% (approximately 6,600,000 WCBA) of the targeted population have received 2 doses of tetanus toxoid (TT). The proportion of WCBA vaccinated fluctuated by country from 14 to 98%. In the other 5 countries with endemic NNT, the same strategy has been applied, but reliable data are not available.

The percentage of reported cases of neonatal tetanus

which are fully investigated increased from 43% to 89% between 1990 and 1993. However, the quality of data recording still needs improvement especially regarding the mother's prenatal care and her vaccine status.

Three major tasks remain: 1) The epidemiological investigation must be improved by obtaining the mother's vaccine status and prenatal care visit information 2) The identification of new migrant settlements should be part of the epidemiological surveillance and such areas should be considered as potentially at risk; 3) Data on vaccination of WCBA living in HRA must be recorded properly.

### **DIPHTHERIA: An old problem resurfaces.**

In 1993, 355 cases of Diphtheria were reported in the Region which was, a 96% reduction compared with 7,900 cases reported in 1977. This can be attributed mainly to the increase in vaccination coverage for the third dose of DPT which increased from 20% to 78% for children less than one year of age between the years 1978 and 1993 in Latin America and the English speaking Caribbean.

In 1993, an epidemic of diphtheria occurred in Ecuador. Between late July of 1993 and mid-August of 1994, 210 cases were reported (13 in 1993 and 197 in 1994) in Pichincha province, which includes Quito. The epidemic spread to the rest of the country. Vaccination in adults started in April, as 74% of cases were found in persons over 15 years of age, compared to only 13% found in the same age group in the previous 10 years. A similar age distribution of cases was observed in recent epidemics of diphtheria in the Russian Federation and Ukraine.

With more than 40% of the municipalities in Latin America with DPT coverage below 80%, the current priority is to increase vaccination coverage in each new born cohort and reduce drop out rates.

Discussion focused on the following important points: Strengthening of surveillance for diphtheria with access to laboratory confirmation must be in place to identify any change in the case incidence and in the age group affected; The medical community should be informed about and sensitized to the importance of this disease, its clinical characteristics, and adequate case management. Reporting should be encouraged and laboratory confirmation of cases should be required. If an epidemic does occur, mass vaccination of the affected age group and other high risk groups should be carried out either with DPT, TD or Td for containment. National laboratories which locally produce DPT and DT vaccines need to be routinely certified to guarantee their quality control procedures.

# Measles Outbreak—Huehuetenango, Guatemala

*From April-May 1994, a measles outbreak of 190 cases, including 4 deaths, occurred within three municipalities (Todo Santos, Huehuetenango, and Chiantla) of the Huehuetenango Health Area in Guatemala. Rural health promoters initially alerted the non-governmental organization, Doctors without Borders, about the outbreak who then provided the first information to the Health Area Headquarters. The information provided indicated that three villages in the municipality of Todo Santos appeared to be the center of the outbreak. On the 27 of May 1994, the EPI coordinating unit of the Guatemalan Ministry of Health first received information about the outbreak.*

## Todo Santos Municipality

Health personnel from Huehuetenango Health Area Headquarters, visited Todo Santos municipality and confirmed that during May 1994, 29 cases, including one death, meeting the measles clinical case definition, had occurred in children less than 10 years of age.

Available vaccination coverage data from this municipality indicated that 64% of all children 1-14 years of age had received one dose of measles vaccine during the mass campaign held in 1992-1993; coverage data for children under one year of age was reported to be 62%.

The first case in Todo Santos municipality occurred around the 1st of May 1994. None of the reported cases had a history of measles vaccination. The affected children were not vaccinated primarily because of religious objections to vaccination. In response to this measles outbreak, health workers implemented control measures and vaccinated all children less than 15 years of age, regardless of their previous vaccination history. The community gladly accepted the opportunity for vaccination fearing that they could be infected by the disease.

## Huehuetenango Municipality

Further investigation revealed that one death occurred due to a secondary infection with pneumonia in a military recruit with recent history of measles in a hospital at the military base located in Huehuetenango municipality. The investigation also revealed that there were 94 cases of rash and fever illness with clinical characteristics compatible with measles as diagnosed by military physicians. Of the total patients reported with measles, 25 patients had rash and fever at the time of the investigation.

The first case in Huehuetenango municipality had rash onset on April 6, 1994, 51 days before the health services of the Guatemalan Ministry of Health were notified. The outbreak investigation revealed military personnel had been in contact with the three villages in the municipality of Todo Santos.

To control the measles outbreak in this military community, immediate vaccination of all military personnel was begun, as well as, demobilization of all military personnel until the epidemic subsided. All active cases were directed to the hospital for treatment.

## Chiantla Municipality

Active search for suspected measles cases was intensified throughout the Huehuetenango Health Area. A further 67 cases of rash and fever were identified, with one death reported in five communities within the municipality of Chiantla. However, only nine cases had rash that was compatible with the clinical measles definition.

Data obtained from the community indicated that cases occurred between epidemiologic weeks 20 and 23 (16 - 29 May 1994). A "mop-up" vaccination effort was initiated in Chiantla municipality to vaccinate all children less than 15 years of age began on the 1st of June.

## Outbreak Summary

Graph 1 shows the epidemic curve for the outbreak which shows that the peak occurred around epidemiologic weeks 19 and 20 (4 - 16 May, 1994).

A total of 19 blood samples were collected from suspected measles patients in Huehuetenango Health Area. Of the total samples tested, 12(63%) were positive for measles IgM.

Age data are available for 187 cases out of the 190 reported cases. The majority of the cases occurred in the 15-44 years age group (Graph 2).

Since week twenty-four, no cases of confirmed measles have been reported from these three municipalities. Active search for further cases and outbreak control measures have continued. Guatemalan Health authorities have kept in close contact with Mexican officials, but to date no related cases have been reported from Mexico.

The Huehuetenango Area Health Headquarters investigation report concluded that the Guatemalan measles outbreak began in early April 1994 primarily among unvaccinated military personnel. Of the total cases reported, 52% occurred in military personnel. A majority of the cases occurred between epidemiological weeks 18 and 21 (11 - 27 May).

The report concluded that military personnel represented a pocket of susceptible persons that introduced the virus into neighboring rural villages. Measles transmission was facilitated in these civilian communities because of the low rates of measles vaccination coverage among children less than 15 years of age.

The report also concludes that there was lack of coordination between the different health services of the Ministry of Health and that of the military which explains the reason why the outbreak was not detected in a timely manner and thus permitted the measles transmission to continue.

*Source: Huehuetenango Area Health Headquarters and the Division of Surveillance and Control of Diseases, Ministry of Health, Guatemala*



# 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<br>and country | Date of<br>last<br>Report | Measles  |      |           |       | Poliomyelitis |      | Tetanus      |      |          |      | Diphtheria |      | Whooping<br>Cough |       |
|--------------------------|---------------------------|----------|------|-----------|-------|---------------|------|--------------|------|----------|------|------------|------|-------------------|-------|
|                          |                           | Reported |      | Confirmed |       |               |      | Non Neonatal |      | Neonatal |      |            |      |                   |       |
|                          |                           | 1994     | 1993 | 1994      | 1993  | 1994          | 1993 | 1994         | 1993 | 1994     | 1993 | 1994       | 1993 | 1994              | 1993  |
| LATIN AMERICA            |                           |          |      |           |       |               |      |              |      |          |      |            |      |                   |       |
| Bolivia                  | 25 Jun.                   | ...      | ...  | 577       | 223   | 0             | 0    | ...          | ...  | 12       | 8    | 5          | 4    | 34                | 38    |
| Colombia                 | 23 Jul.                   | ...      | ...  | 68        | ...   | 0             | 0    | ...          | ...  | ...      | ...  | ...        | ...  | ...               | ...   |
| Ecuador                  | 31 Aug.                   | ...      | ...  | 1 942     | ...   | 0             | 0    | ...          | ...  | ...      | ...  | 472        | ...  | ...               | ...   |
| Peru                     | 31 Aug.                   | ...      | ...  | 272       | ...   | 0             | 0    | 63           | ...  | 88       | ...  | 34         | ...  | 1 030             | ...   |
| Venezuela                | 13 Aug.                   | ...      | ...  | 11 680    | ...   | 0             | 0    | ...          | ...  | 6        | ...  | 0          | ...  | 416               | ...   |
| Southern Cone            |                           |          |      |           |       |               |      |              |      |          |      |            |      |                   |       |
| Argentina                | 09 July                   | 316      | ...  | 44        | ...   | 0             | 0    | ...          | ...  | ...      | ...  | ...        | ...  | ...               | ...   |
| Chile                    | 18 June                   | 83       | ...  | 0         | ...   | 0             | 0    | ...          | ...  | ...      | ...  | ...        | ...  | ...               | ...   |
| Paraguay                 | 30 July                   | 76       | ...  | 56        | ...   | 0             | 0    | ...          | ...  | ...      | ...  | ...        | ...  | ...               | ...   |
| 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             | ...   |
| Central America          |                           |          |      |           |       |               |      |              |      |          |      |            |      |                   |       |
| 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    | ...          | ...  | ...      | ...  | ...        | ...  | ...               | ...   |
| Guatemala                | 23 Jul.                   | 227      | 247  | 204       | 13    | 0             | 0    | ...          | ...  | ...      | ...  | ...        | ...  | ...               | ...   |
| Honduras                 | 20 Aug.                   | 10       | 85   | 1         | 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    | ...          | ...  | ...      | ...  | ...        | ...  | ...               | ...   |
| Mexico                   | 27 Aug.                   | 835      | ...  | 108       | 106   | 0             | 0    | 85           | 103  | 52       | 65   | 0          | 0    | 139               | 118   |
| Latin Caribbean          |                           |          |      |           |       |               |      |              |      |          |      |            |      |                   |       |
| Cuba                     | 28 May                    | ...      | ...  | ...       | ...   | 0             | 0    | ...          | ...  | ...      | ...  | ...        | ...  | ...               | ...   |
| Haiti                    | ...                       | ...      | ...  | ...       | ...   | 0             | 0    | ...          | ...  | ...      | ...  | ...        | ...  | ...               | ...   |
| Dominican Republic       | 25 June                   | ...      | ...  | 296       | 1 486 | 0             | 0    | ...          | ...  | 4        | 0    | 1          | 4    | 9                 | 5     |
| CARIBBEAN                |                           |          |      |           |       |               |      |              |      |          |      |            |      |                   |       |
| Antigua & Barbuda        | 27 Aug.                   | 2        | 0    | 0         | 0     | 0             | 0    | ...          | 1    | ...      | ...  | ...        | ...  | ...               | ...   |
| Bahamas                  | 27 Aug.                   | 4        | 0    | 0         | 0     | 0             | 0    | ...          | 0    | ...      | 0    | ...        | 0    | ...               | 0     |
| Barbados                 | 27 Aug.                   | 28       | 3    | 0         | 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     |
| NORTH AMERICA            |                           |          |      |           |       |               |      |              |      |          |      |            |      |                   |       |
| Canada                   | 26 Feb.                   | ...      | ...  | 198       | 187   | 0             | 0    | 1            | 6    | ...      | 0    | 0          | 4    | 2 302             | 6 777 |
| United States            | 30 July                   | ...      | ...  | 777       | ...   | 0             | 0    | 21           | ...  | ...      | ...  | 0          | ...  | 1 761             | ...   |

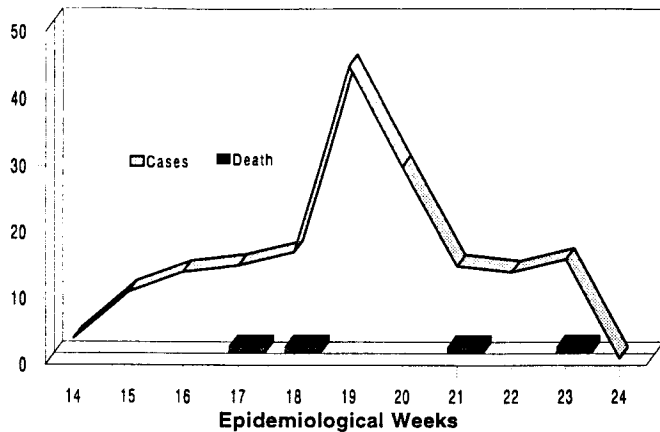
... Data not available.

# Measles Outbreak

( continued from page 6)

## MEASLES CASES AND DEATHS HUEHUETENANGO, GUATEMALA WEEKS 14-24, 1994

Number of Cases



Source: Health Area Headquarters, Ministry of Health Guatemala

### Editorial Note:

This is an excellent report which provides important information concerning the epidemiology of measles in Central America. Based on the Guatemalan experience, the following general conclusions can be made:

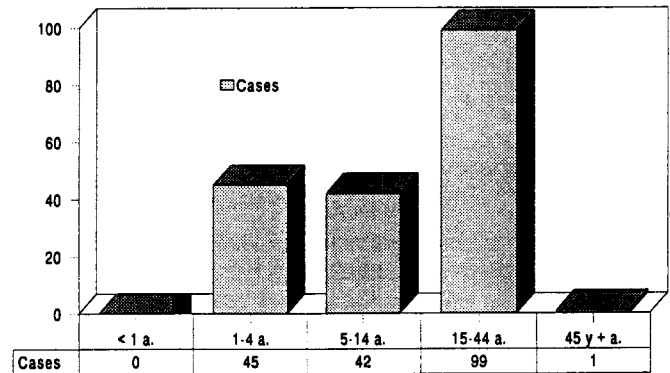
1. This outbreak highlights the importance of regularly monitoring vaccination coverage by municipality and organizing "mop-up" campaigns for those municipalities with low coverage following a mass vaccination campaign.
2. Religious groups with objections to measles vaccination are a high-risk group for measles infection. Efforts should be made to educate these groups about

the measles elimination activities and to encourage them to vaccinate their children.

3. Because of the high transmissibility of measles virus, persons living in densely populated closed communities, such as military camps, may be at increased risk for measles. Consideration should be given to routinely providing measles vaccination to new military recruits.
4. Strong collaboration and communication are needed between various groups to achieve improved measles control and its eventual elimination. It is critical to improve the coordination of activities of groups including the Ministry of Health, schools, the private sector, and the military.

## DISTRIBUTION OF MEASLES CASES BY AGE GROUP HUEHUETENANGO, GUATEMALA WEEKS 14-24, 1994

Number of Cases



Source: Huehuetenango Health Area Headquarters, Ministry of Health Guatemala

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