

EPI Newsletter

Expanded Program on Immunization in the Americas

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IMMUNIZE AND PROTECT YOUR CHILDREN

June 2000

Measles Outbreak in an Isolated Community of Bolivia

Background

In May 2000, the Pan American Health Organization notified the immunization program in Santa Cruz, Bolivia that two laboratory-confirmed measles cases with a recent history of travel to Santa Cruz had been reported in Canada. According to the information received, these cases had rash onsets on May 21 and 28, 2000. They had been in Santa Cruz until May 9. Among the places they visited was a Mennonite community located approximately 200 km east of Santa Cruz in a remote area within the municipality of Pailón. This Mennonite community was established three years ago with settlers coming from a similar community in Canada.

Outbreak Investigation

On June 4, interviews with the leaders of the Mennonite community in Santa Cruz confirmed the visits from Canada on the indicated dates. The investigation team conducted a *house-to-house* visit of all households (thirty-three families, total population of 229 persons). Of the total population, 45 persons (20%) were less than 5 years of age. During two consecutive visits held on June 4 and 14, a total of 65 suspected measles cases were identified. They occurred in 18 (55%) of the 33 families of the community. Rash onset of the first case was on March 26, and rash onset of the last case occurred on June 13 (Figure 1). Blood samples were obtained in 11 cases for serology studies. All 11 samples were found positive for measles using an indirect capture test at the National Reference Laboratory, and the rest of the cases were confirmed through epidemiological link. To

identify the viral genotype, urine samples were obtained from four cases whose rash onset was ≤ 7 days prior to the visit. Results from those tests are pending. Of the 65 total confirmed cases, 30 (46%) were under 5 years of age (attack rate of 67%). Prior to the outbreak, vaccination coverage for measles in children 1-4 years of age was 36%.

The index case in the Mennonite community of Santa Cruz was a 10-year old girl who had visited her family in the community of Las Piedras II, two weeks prior to rash onset (March 26, 2000). During her stay at her relatives' house she

was in contact with a cousin who had fever and rash. The second case appeared 12 days after (April 4) in a 17-year old adolescent who had visited the sick girl. Following these two incidents, cases started to multiply until the day of the outbreak investigation. During the investigation at Las Piedras II, it was determined that there had been cases of measles during, at least, the first quarter of 2000. The last case was detected on March 28, which occurred in the family that served as a link with the Mennonite community cluster.

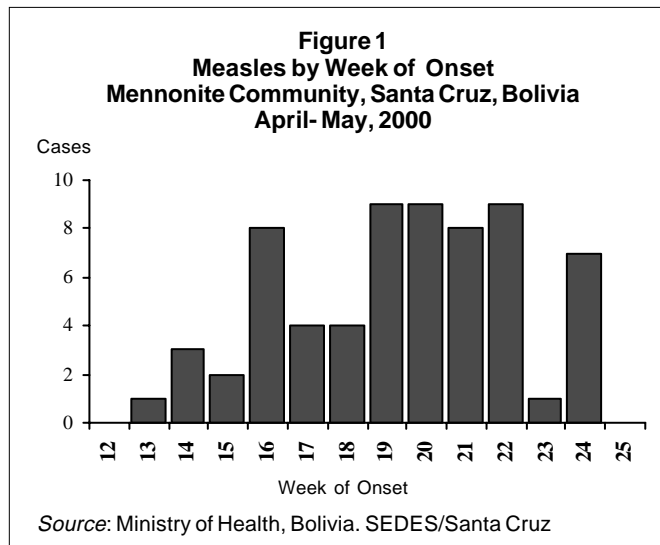
Through interviews it was determined that one of the cases

of the outbreak, a child from Las Piedras community, had consulted a private physician in February and was even hospitalized, but the case was never reported to the District.

Control Measures

Vaccination in Mennonite Communities

Following the detection of the outbreak, a *house-to-house* vaccination campaign was carried out in two visits. Of



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the 33 families visited, 3 (9%) expressed philosophical objections to vaccination. After several one-to-one educational meetings with these members of the community (which included the religious leader), they decided to cooperate with the campaign efforts and were vaccinated in the second visit. Rash onset among six of the 65 total cases occurred around six days following vaccination. This can be explained because at the time of vaccination, all these cases had already been in contact with infectious cases for some days, and were therefore incubating the disease. Nonetheless, none of these six cases presented complications.

Interventions in other communities

In view of the outbreak in two Mennonite communities, a vaccination campaign for persons between the ages of 6 months and 30 years of age was carried out in all similar communities in the Department of Santa Cruz. As of July 10, 2000, 15 (38%) of 39 similar communities in Santa Cruz had already been adequately vaccinated (coverage $\geq 95\%$), with coverage confirmed through door-to-door monitoring. Simultaneously, a door-to-door active search for suspected measles cases was carried out in all communities. Also, an active search was carried out in the city of Santa Cruz, particularly in areas of the city that receive frequent visits by members of these communities, and coverage was monitored throughout Santa Cruz as well. Vaccination coverage was over 80% in only two of the 10 blocks monitored in the five districts.

Conclusions

1. Due to low vaccination coverage and the absence of epidemiological surveillance, rural communities such as the one described represent high-risk groups for ongoing measles circulation
2. A major cause of the outbreak was: a) lack of a vaccination program (routine and during outbreaks); and b) lack of ongoing and systematic outreach and education efforts that highlight the importance of immunization
3. Deficiencies in surveillance, particularly regarding the participation of the private sector, contributed to the late detection of the outbreak and therefore to its magnitude and duration
4. Low measles vaccination coverage found in Santa Cruz during the monitoring efforts indicated that the city is at risk of measles reintroduction.
5. Nonetheless, no evidence of sustained measles transmission was found in Santa Cruz.

Recommendations

Immediate actions

- Initiate and maintain outreach and education programs for these communities on immunization and related issues. These activities should be planned and implemented in close collaboration with the community leaders
- Plan individual visits to these communities to guarantee cooperation for emergency vaccination activities
- Implement door-to-door vaccination of all similar communities, including all persons aged 6 months to 30 years, until $\geq 95\%$ vaccination coverage is reached

- Confirm vaccination coverage reached through door-to-door and school monitoring.
- Implement an active search for suspected measles cases at:
 - all communities during vaccination campaigns
 - all clinics and health centers that serve these communities
- Encourage the participation of private physicians in measles reporting including those already identified as working in these communities. To this end, visit them regularly and strategically place colorful posters with photographs of measles cases and a contact phone number to report suspected measles at all physician's offices
- Prioritize areas at highest risk, carry out door-to-door vaccination of children under 5-years of age in the entire city of Santa Cruz, guaranteeing coverage of at least 95% through daily monitoring and supervision.

Medium-term actions

- Maintain regular outreach activities and education programs on immunization targeting the needs of these communities
- Train and equip Mennonite vaccinators for all the communities
- Supervise work of vaccinators at least every two months
- During supervision, carry out active search of suspected measles cases and monitor vaccination coverage, both *house-to-house* and at schools
- Continue visiting all private physicians to encourage reporting
- Continue *house-to-house* vaccination in the city of Santa Cruz and at other at-risk areas.

Source: Francisco Giménez S.; Fernando Gil M.; Ana María Barba P.; and Nancy Titichoca V., Ministry of Health, Bolivia.

Editorial Note: Following the measles outbreaks in both Bolivia and Canada, warnings were sent to all countries in the Region to determine the level of vaccination of similar communities in their territories. Investigations were conducted in Argentina, Paraguay, Brazil, Dominican Republic and Guatemala. No reported measles cases have been found in any of them. Moreover, in most of these countries, particularly the Dominican Republic and countries in Central America, Mennonite communities have been collaborating in ongoing immunization efforts. These experiences indicate that these communities are receptive and supportive of vaccination if approached appropriately.

Because of frequent international contacts, fast growth, dispersion of the dwellings and rural location, these communities can be prone to prolonged epidemics, which can be difficult to detect. Therefore, it is essential that all countries increase efforts to ensure prompt and adequate vaccination and improved disease surveillance.

The Bolivian and Dominican Republic experiences can be replicated in other countries of the Region. It is suggested that health authorities establish local contacts with Menno-

nite leaders and maintain an ongoing dialogue with them on health issues, which stresses the benefits of immunization. As part of this dialogue it is recommended that national immunization programs: (1) keep regular outreach and education events on immunization focusing on the needs of these communities (utilizing their own publications, when-

ever possible); (2) train and equip vaccinators belonging to the community; (3) carry out supervisory visits that have an educational component for these vaccinators at least every two months; and (4) during supervisory visits, monitor vaccination coverage and active search of suspected measles cases.

Surveillance of pneumonia and bacterial meningitis

The Division of Vaccines and Immunization (HVP) of the Pan American Health Organization is supporting countries in the Region in implementing surveillance systems that enable the monitoring of pneumonia and bacterial meningitis. These efforts address the different levels and stages of existing surveillance systems in each country.

Laboratory-based surveillance

This effort was initiated in 1993 and seeks to monitor invasive *S. pneumoniae* in children under 5 years of age. The system has been expanded to include *H. influenzae*, and plans are under way to include *Neisseria meningitidis*. A quality control system has been developed with the participation of the National Institute of Health Public of Cuernavaca, Mexico; the National Institute of Health of Colombia; and the Institute Adolfo Lutz in Brazil. The National Center of Streptococcus of Alberta, Canada has the role of regional reference center.

Meningitis surveillance

PAHO aims to strengthen meningitis surveillance and reporting by supporting sentinel hospitals, promoting the inclusion of all meningitis in the surveillance, and by ensuring the collection of CSF liquid and its appropriate processing to improve the isolation of etiologic agents. New diagnostic methods will be introduced in the near future.

Pneumonia surveillance

It is implemented through a network of sentinel hospitals, selected on the basis of the annual number of pneumonia hospitalizations, the commitment of clinicians and resident physicians, and hospital authorities in participating and complying with proposed surveillance standards (capturing and entering in the system all pneumonia as defined by the clinicians and preferably in accordance with WHO criteria) to take x-rays and blood culture. In this kind of surveillance, the radiological interpretation will be the diagnostic marker. As a result, it is important to establish some quality control system that guarantees the quality of the information being generated.

Population-based pneumonia surveillance

Attempts are being made to implement pneumonia surveillance in countries with a geographical area in which a

defined population of over 200,000 people can be identified, available demographic information, a known health system (referral hospital and associated health center), availability of political and technical commitment, and the ability of the health system to capture all cases of pneumonia at all levels during a specific study period.

Countries will implement surveillance based on available resources and capacity to make a commitment. Therefore, it is not expected that all of them set up population-based studies or even incorporate pneumonia surveillance from the start. PAHO is providing the necessary technical support and available resources while also promoting technical cooperation and mobilization of human resources among countries and participating surveillance groups.

Ideally, a surveillance system for pneumonia should integrate clinical, epidemiological, laboratory and radiological information for each pneumonia case classified as "suspected" within the surveillance system. However, the etiological diagnosis of bacterial pneumonia is difficult due to the limitations in the isolation of microorganisms from blood. Surveillance of bacterial pneumonia using x-rays of the thorax has recently been suggested. Within the diagnostic methods that can be utilized to diagnose bacterial pneumonia, the chest x-rays (Rx) is the only examination showing the greatest sensitivity and specificity. However, this method as an indicator of bacterial pneumonia requires establishing a consensus of its use and of the interpretation of x-rays case confirmation.

Argentina, Brazil, Chile, Colombia, Paraguay, Peru and Uruguay are in the process of implementing a bacterial pneumonia surveillance system based on x-rays. In support of these efforts, a workshop in Chile was held to:

- Standardize a method that enables the digital filing of radiographic evidence for later evaluation at a central level.
- Compare the consistency of results from direct reading of chest x-rays with the corresponding images obtained through digitizing x-rays, with the use of a digital camera of adequate resolution.
- Discuss ways of implementing this method as a system of quality control of surveillance.

Managing Immunization Safety Concerns

One of the greatest public health success stories has been the prevention of infectious diseases by means of vaccination. Few other public health tools have averted more deaths and illness than vaccines used in immunization programs. In order to maintain and improve the strength of every national immunization program, workers at each level should be educated about the issues surrounding vaccination and they should be prepared to respond to any public concerns. The quick response to a public concern regarding vaccines and the rapid, honest communication of explanations and actions will ensure the integrity of immunization programs.

*During the XIII Technical Advisory Group on Vaccine Preventable Diseases of the Pan American Health Organization held in Canada in 1999, it was recommended that guidelines be prepared to provide health workers and public health practitioners with some general principles and guidelines to effectively manage concerns about vaccination safety in their countries. In response, PAHO has developed a document entitled, **Guidelines for Managing Immunization Safety Concerns**. The recommendations found in these guidelines should complement information collected at the country level through other analytical studies, including pre-licensure clinical trials. What follows are excerpts from the document, which is available on the web at: http://www.paho.org/English/HVP/HVI/hvp_immunsafety.htm*

Every immunization program should ensure the safety of vaccines and be prepared to deal with any public concern about vaccination safety. Some of the events may be known effects observed during pre-licensing clinical trials or during experimental stages of vaccine development. In addition, many medical events, allegedly reported as vaccine-related, are background illnesses transmitted through the community regardless of vaccination. The first few years of a child's life are the most vulnerable years with regard to illness, and it is also the time period when other diseases begin to manifest themselves (i.e. developmental disorders, hearing difficulties, etc). These early years are also when vaccines are administered. It is not difficult for the "coincidental" vaccination to be misinterpreted as causal. In fact, in many of these events, it is nearly impossible to find out the true cause, even with the most detailed investigation. Any medical event perceived by the public, by parents, by the recipient or by health workers to be allegedly vaccine-related should be examined at the local level. If deemed appropriate (i.e. the time period and symptoms support a suspicion of being vaccine-related), a more formal standardized investigation should be initiated.

Upon completion of the investigation, these events should be classified into one of the following categories: program-related, vaccine-related, not related, or unknown (inconclusive investigation). The purpose of detecting, investigating and analyzing these events is to take action based on the conclusions reached by this process. Ultimately, by taking action, confidence in the immunization program is

reinforced, but only if there is open and honest communication with the public.

As technology improves with time, so does the quality and effectiveness of the vaccines used. Although vaccines today are much safer than they were 40 years ago, with new vaccines arriving on the market every year and an increase in information dissemination via the Internet, public concerns of safety and benefits of vaccines continue to grow. Immunization programs have a duty to address these concerns.

Vaccine Quality and Safety

All vaccines procured through the World Health Organization for national immunization programs must meet WHO requirements. The suppliers for the vaccines must go through the WHO pre-qualifying process which involves an examination of the vaccine characteristics, adherence to Good Manufacturing Practice standards during vaccine production and the activities of the National Regulatory Authority (NRA). WHO considers a vaccine to be of known good quality provided: the NRA controls the quality of the vaccine according to the six critical functions defined by WHO and there are no unresolved confirmed reports of problems related to quality. These six critical functions are:

- well-established licensing process
- regular inspections for compliance with Good Manufacturing Practice standards
- authorization and evaluation of clinical performance
- laboratory testing
- a system of lot release
- review of clinical data collected during surveillance of vaccine field performance

The safety and efficacy of vaccines are demonstrated during the clinical trials conducted before licensing. These trials undergo different phases under controlled conditions evaluating the efficacy and safety of the vaccine, to fulfill conditions required to registration. Follow-up studies of vaccines after licensing occur when the vaccine is applied to the population. This follow-up provides information about the effectiveness of the vaccine and if communicated properly can add valuable knowledge to the vaccine profile.

Many reported events that have been allegedly related to vaccines indicate a problem with vaccine administration: contamination, improper injections, cold chain problems and dosage/dilutant mistakes. These problems can be easily fixed with proper training, handling and storage techniques. It is imperative that every local level health worker is aware of these potential problems and recognizes them when they occur, so rapid correction can be instituted.

What to investigate?

Any serious event, rumors, events occurring in clusters or program related events require(s) an investigation. What is deemed a serious event? Hospitalization, a life threatening situation, death and disability. As soon as any event is allegedly vaccine-related, the health care worker should inform parents about the safety of immunization, reassure them, and explain that coincidental events can occur. The investigation should be conducted within the first 24 hours.

General guidelines for the investigation

- Basic variables to be collected:
 - Demographic data, age, sex and place of residence
 - Recent case history, type, date of appearance, duration, and treatment of the clinical event. History of pathology and clinical history of the patient
 - Vaccination history: type of vaccine used and date of last dose.
- Identification of vaccine used
- Review of operational aspects of the program
- Determination of whether the event reported is an isolated incident or whether there are other associated cases.

Only until the investigation is completed, will it be possible to determine the cause(s) of the event. Actions to be taken should be based on the conclusions of the investigation. Following each investigation it is important to inform concerned parties of the results of the investigation. This may entail clear communication and information that may go to the parents, town, state, regulatory authorities, health authorities, professional associations, or the entire country, including the mass media when appropriate.

1. The event is definitely not related to vaccination

Although the event was not related to vaccination, it may require appropriate medical follow up, in which case a referral should be made.

2. The event is related to vaccination

- **Program-related**
 - Corrective actions should be implemented immediately, and these should include logistical, training and supervisory aspects.
- **Vaccine-related**
 - The event occurred within an expected frequency: inform concerned parties of the results of the investigation.
 - The event was unexpected or occurred at an unexpected frequency.

If vaccine-related, the following actions should be immediately taken:

- Stop vaccinating with the vaccine in question
- Coordinate with the National Regulatory Authority to reassess the quality of the vaccine and contact manufacturer as appropriate

- Recall the vaccine when appropriate
- Report investigation results to the Pan American Health Organization for international information dissemination

3. The investigation is inconclusive

Inform concerned parties of the results of the investigation. This may entail clear communication and information, and could involve the mass media when appropriate.

Communication about Immunization Safety Concerns

Countries should work to improve communication paths to the community and health care workers. Messages should be disseminated quickly and they should address the concern(s) of the public. Educational materials promoting vaccination and expressing the risks and benefits of vaccination should be available. Key information about any investigation of a vaccine concern should be relayed to the public and other health care workers with honesty, completeness and accuracy.

A dedicated spokesperson within the health department should have special training for preparing media releases and developing public statements for rumor control. This person should also be a contact for local health workers to provide assistance formulating plans regarding any alleged vaccine-related issues that may arise.

Education About Immunization Safety

Education materials should be available for health care workers to use during their encounters with children and their parents. These materials should provide information regarding known side effects and frequency at which they occur.

Also, health care workers need to know about events caused by program-related errors. Every health care worker should undergo training to learn how to avoid making program-related errors, which could lead to an increase in side effects attributable to vaccination. During critical time periods (i.e. vaccination campaigns, ongoing investigations, etc.) health care workers should have information readily available to learn the facts about immunization, and disseminate accurate and truthful information to parents/guardians/adults.

Editorial Note: This report seeks to support immunization programs in the Americas and worldwide in developing mechanisms to:

- Report, investigate and analyze alleged vaccine-related events
- Take action to correct any problems identified from the investigation
- Communicate efficiently and effectively with the community, other public health practitioners, health workers and the media
- Educate health workers to recognize potential vaccine-related events
- Educate parents about the known side effects of vaccines and of the diseases they protect against.

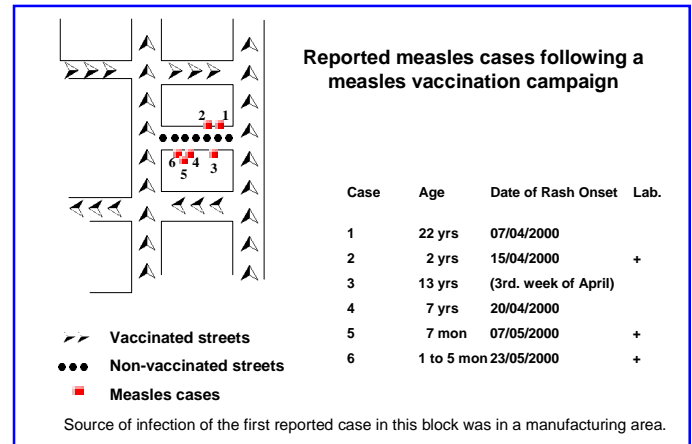
Lessons Learned: Outbreak Response in the Dominican Republic

Health authorities in the Dominican Republic conducted *mop-up* campaigns from March 10-April 15 in order to interrupt measles transmission in areas where the virus was circulating. By December the country had carried out an indiscriminate measles campaign in 19 provinces. These provinces were chosen based on recent confirmed measles cases, low measles vaccination coverage in children under 5 years of age, poor surveillance indicators, provinces bordering Haiti and urban areas with low income population and overcrowding. The March-April *mop-up* campaign included a total of 26 provinces, as well as several neighborhoods in Santo Domingo (please refer to the April 2000 issue of the *EPI Newsletter*). This operation was undertaken in Santiago de los Caballeros, the second largest city in the Dominican Republic. As can be seen in the diagram on the right, in an area visited for measles vaccination not all streets were covered for vaccination. During a subsequent outbreak investigation of the same area done in May, six cases were found in exactly the street where vaccination had not taken place. These six unvaccinated cases were eligible for vaccination during the campaign but were not covered.

Editorial Note: The adequate organization of a vaccination campaign and the ongoing supervision are essential to prevent the recurrence of pockets of non-visited areas that could allow virus transmission to continue. Outbreak response activities should be rapid and well-organized, with one supervisor for each 5-10 vaccinators, daily monitoring of the work by epidemiologists, and effective use of maps of areas to be vaccinated.

HVP staff have been working closely with all countries who currently have ongoing measles virus transmission.

Generally speaking, the major obstacles have been inadequate supervision, as well as inadequate procedures for carrying out supervisory activities. Based on the lessons learned from previous vaccination efforts in the Americas, the most important elements include:



Staff Attributes

- Motivated
- Adequately trained (problem solving skills)
- Willingness to walk long distances every day

Methods

- Health workers use chalk to mark house visited and vaccinated
- Supervisory visits take place to both marked and un-marked houses
- Supervisors have forms for tallying results of visits
- Supervisors meet at the end of the day to discuss findings and to improve vaccination tactics.

Polio Surveillance

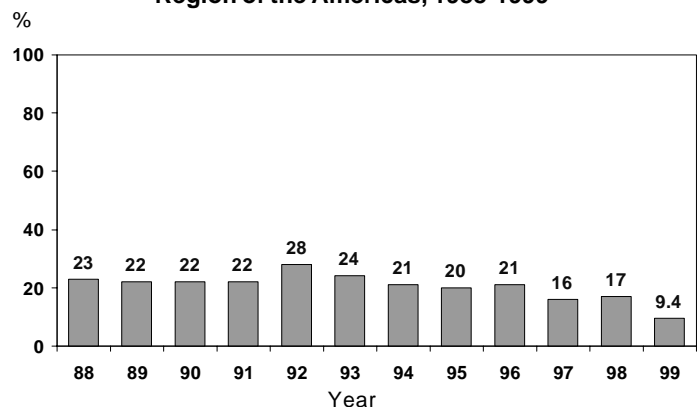
The percentage of viral isolation at laboratories in the Region has steadily declined in recent years as seen in Figure 1.

Given the proportion of viral isolation linked to laboratory procedures as well as to the quality of samples, it is difficult to prove that the reduction in viral isolation is due to a smaller circulation of enterovirus and post-vaccine polio in the Region. Therefore, virologists, epidemiologists and health workers are urged to intensify their efforts to guarantee that samples of acute flaccid paralysis (AFP) cases are collected within 15 days of onset and that they are sent to the laboratory in adequate condition.

Each country should review its percentage of viral isolation in the last five years to analyze the proportion of samples collected on a timely basis, and the proportion of samples arriving at the laboratory in adequate condition (adequate amount, properly labeled, well-packaged, adequate cold chain, timely dispatch following collection). Laboratories should establish a mechanism to immediately

report to health staff responsible for polio surveillance if samples were received at the laboratory on the specified date and in adequate condition.

Figure 1
Percentage of viral isolation of AFP samples
Region of the Americas, 1988-1999



Source: PESS/PAHO

Measles Surveillance in the Americas Final Case Classification, 1999

Region	Country	Final 1999 Data					Total Confirmed Cases 1998
		Total Suspected Cases		Confirmed Cases			
		Notified	Discarded	Clinically*	Laboratory#	Total	
Andean Region	Bolivia	2,003	562	165	1,276	1,441	1,004
	Colombia	1,683	1,646	27	10	37	61
	Ecuador	676	676	0	0	0	0
	Peru	999	987	4	8	12	10
	Venezuela	395	395	0	0	0	4
Brazil	Brazil **	39,647	33,557	416	381	797	2,781
Central America	Belize	41	41	0	0	0	0
	Costa Rica	192	169	19	4	23	27
	El Salvador	133	133	0	0	0	0
	Guatemala	290	290	0	0	0	1
	Honduras	152	152	0	0	0	0
	Nicaragua	891	891	0	0	0	0
	Panama	192	192	0	0	0	0
English-speaking Caribbean	Anguilla	6	6	0	0	0	0
	Antigua & Barbuda	3	3	0	0	0	0
	Bahamas	9	9	0	0	0	0
	Barbados	32	32	0	0	0	0
	Cayman Islands	0	0	0	0	0	0
	Dominica	1	1	0	0	0	0
	Grenada	56	56	0	0	0	0
	Guyana	30	30	0	0	0	0
	Jamaica	91	91	0	0	0	2
	Montserrat	0	0	0	0	0	0
	Netherlands Antilles	0	0	0	0	0	0
	St. Kitts & Nevis	8	8	0	0	0	0
	St. Lucia	2	2	0	0	0	0
	St. Vincent & Grenadines	2	2	0	0	0	0
	Suriname	36	36	0	0	0	0
	Trinidad & Tobago	22	22	0	0	0	0
	Turks & Caicos	0	0	0	0	0	0
	British Virgin Islands	2	2	0	0	0	0
U.S. Virgin Islands	0	0	0	0	0	0	
Latin Caribbean	Cuba	1,831	1,831	0	0	0	0
	Dominican Republic	2,107	1,833	16	258	274	14
	French Guyana	0	0	0	0	0	0
	Guadeloupe	3	3	0	0	0	2
	Haiti	13	13	0	0	0	3
	Martinique	0	0	0	0	0	0
	Puerto Rico	0	0	0	0	0	0
Mexico	Mexico	43	43	0	0	0	0
North America	Bermuda	0	0	0	0	0	0
	Canada	29	0	0	29	29	12
	United States	100	0	0	100	100	100
Southern Cone	Argentina	1,470	1,157	5	308	313	10,229
	Chile	243	212	0	31	31	6
	Paraguay	873	873	0	0	0	70
	Uruguay	34	0	0	34	34	6
Total		54,340	45,956	652	2,439	3,091	14,332

... No information provided

* Clinical suspicion of measles without laboratory investigation

Includes epidemiological linked cases

Source: MESS/HVP except for Argentina, Brazil, Canada, Cuba, Guadeloupe, Haiti and United States.

Updated: 26 July 2000 – ** 5,293 pending classification in Brazil

Yellow Fever in the Americas

Yellow fever remains an important public health problem in the Americas. In 1999, 207 cases were reported with 100 deaths (Table 1). Bolivia, Brazil, and Peru accounted for 33%, 36% and 27% of all cases respectively. As of June 21, 2000, a total of 74 confirmed cases have been reported with 38 deaths. Seventy-one of the 74 cases have occurred in Brazil (Table 2). Reports from the Brazilian Ministry of Health show that most of these cases come from the State of Goiás and its neighboring states, where an extensive epizootic took place in the first half of the year 2000. Brazil has strengthened its surveillance for yellow fever. It is also implementing a mass vaccination campaign in affected areas and promoting the use of yellow fever vaccine for travelers to enzootic areas.

Table 1
Reported cases and deaths from yellow fever
Region of the Americas, by country, 1985-2000

Country	1985-1995		1996		1997		1998		1999*		2000*	
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths
Bolivia	424	319	30	21	63	47	57	39	68	33	1	0
Brazil	202	88	15	12	3	3	34	15	75	28	71	37
Colombia	55	47	8	4	5	4	1	0	2	2		
Ecuador	45	29	8	8	31	4	3	1	5	3		
French Guiana	-	-	-	-	-	-	1	1	-	-		
Peru	1,431	914	86	34	44	20	165	49	56	33	2	1
Venezuela	2	1	-	-	-	-	15	4	1	1		
Total	2,159	1,398	147	79	146	78	276	109	207	100	74	38

* Provisional data
Source: PAHO/Country Reports

All cases reported in the Region since the 1940s have been the jungle form of yellow fever, which is transmitted by the genus *Haemagogus* mosquito. However, the overwhelming spread of the *Aedes aegypti* mosquito threatens to

re-urbanize the disease (refer to *EPI Newsletter*, August 1999 for an extensive report on yellow fever.) The seriousness of the current yellow fever situation in the Region calls for a firm commitment by countries to adopt a strong and effective strategy for controlling the disease. PAHO's recommendations focus on preventing its re-urbanization through surveillance, vaccination and vector control.

Table 2
Confirmed cases of yellow fever in Brazil
January-June 2000

State	Cases	Deaths
Amazonas	1	0
Bahia	10	3
Brasilia, D.F.	1	1
Goiás	45	22
Mato Grosso	4	3
Minas Gerais	2	2
Sao Paulo	2	2
Tocantins	6	4
Total	71	37

Source: CENEPI-FUNASA-Ministry of Health, Brazil

Editorial Note: There is concern about countries inside the enzootic areas that are silent on case reporting. PAHO is focusing on strengthening its collaboration with these countries to improve yellow fever surveillance. A yellow fever web site has been developed to update on the situation of the disease in the Americas. Information on cases will be updated regularly. Countries are being encouraged to report weekly on the occurrence of cases and negative reporting.

The *EPI Newsletter* is published every two months, in Spanish and English by the Division of Vaccines and Immunization (HVP) 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.



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

Division of Vaccines and Immunization
525 Twenty-third Street, N.W.
Washington, D.C. 20037
U.S.A.
<http://www.paho.org>

Editor: Ciro de Quadros
Associate Editor: Monica Brana

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