

# EPI Newsletter

## Expanded Program on Immunization in the Americas

Volume VI, Number 3

IMMUNIZE AND PROTECT YOUR CHILD

June 1984

### Measles in Brazil

#### Investigation of a Measles Outbreak in Planaltina, Federal District, Brazil

In April 1983 the Federal District of Brasilia, Brazil, registered an unusual increase in the number of reported measles cases (Figure 1). Preliminary analysis of the cases showed they were evenly distributed in all eight administrative regions of the Federal District, an area occupying 5,771 km<sup>2</sup> in the central Brazilian plateau, with a total population of nearly 1.2 million inhabitants, almost entirely urban (96 percent).

Vaccination data for the previous few years indicated that coverage in children under 1 year of age was around 70 percent. In view of the outbreak, Federal District health authorities decided to intensify measles vaccination in the first half of May, targeting the age group of children 9 months to 9 years of age, who accounted for over 70 percent of all reported cases. Over 60,000 doses of vaccine were

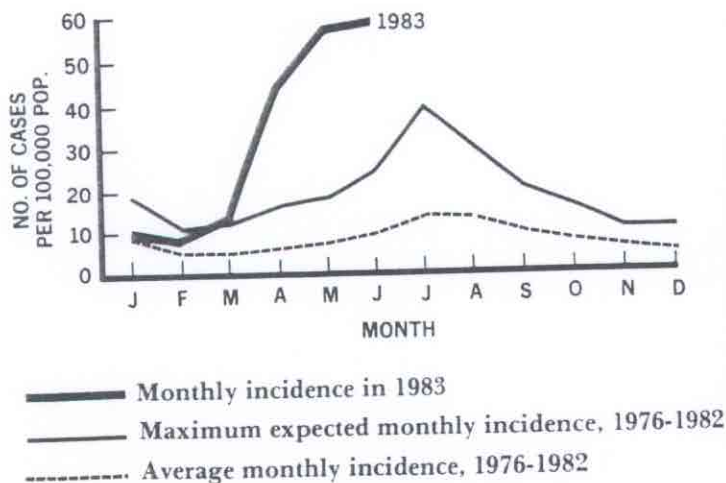
administered in this period, as opposed to only 5,000 doses which would normally have been given. By mid-June, however, the incidence of the disease was even higher than before.

#### Sample Survey Methodology

The persistence of the measles epidemic despite apparently high levels of vaccination coverage led the Ministry of Health to initiate an epidemiologic investigation of the situation. Authorities chose Planaltina, one of the Federal District's eight administrative regions (Figure 2), as the site of a random sample survey to determine vaccination coverage and vaccination history by age group, vaccine efficacy, and history of the disease during the outbreak. Planaltina's population (60,000 inhabitants in 1983) and demographic distribution (85 percent urban) offered ideal conditions for this type of study.

For the purpose of the study, Planaltina was divided into 244 blocks (clusters) with an average of 37 households per block. Thirty clusters were selected for the survey.<sup>1</sup> Health agents used a standard questionnaire to collect

FIGURE 1. Monthly measles incidence in Federal District of Brazil, January - June 1983. Maximum expected monthly incidence and average monthly incidence, 1976-1982.



<sup>1</sup> See "Cluster sampling to assess immunization coverage: a review of experience with a simplified sampling method," R.H. Henderson and T. Sundaresan, *Bulletin of the World Health Organization* 60(2):253-260, 1982. Also *Programa ampliado de imunizações PAI. Curso sobre planificação, administração e avaliação*. Pan American Health Organization and Ministry of Health of Brazil, Brasilia, 1980.

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information on the outbreak and search for additional cases that might have occurred during the previous six months.<sup>1</sup> Questionnaires were completed in 997 households (11 percent of all households) over a period of two weeks, beginning 25 June 1983.

FIGURE 2. Administrative Regions of the Federal District (F.D.) of Brazil

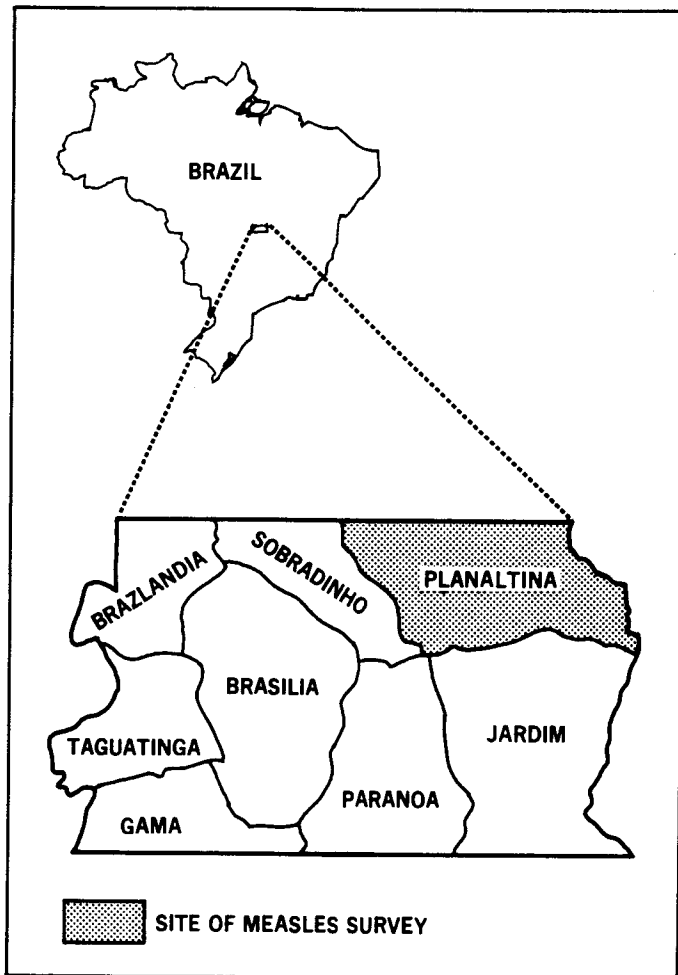


TABLE 1. Measles vaccination coverage, by age group, in Planaltina (F.D.), Brazil, 31 December 1982 and 30 June 1983.

Age group	Coverage (%)	
	31 December 1982	30 June 1983
9-11 months	38.2	71.9
1-4 years	77.6	88.1
5-9 years	59.7	80.1
TOTAL: 9 mos.-9 yrs.	68.4	84.0

TABLE 2. Estimated measles vaccination coverage rates in children less than 1 year of age, Planaltina (F.D.), Brazil, 1978-1981.

Year	Coverage (%)
1978	62.8
1979	63.6
1980	75.6
1981	66.5

A total of 300 cases occurring between January and June 1983 were recorded during the investigation. One hundred six cases (40 percent) of those with known vaccination history occurred in vaccinated individuals while 158 (60 percent) occurred in unvaccinated individuals. Children under 5 years of age accounted for 212 (70 percent) of cases (Table 3).

TABLE 3. Number of measles cases, by age group and vaccination history. Planaltina (F.D.), Brazil, January - June 1983.

Age group (in years)	Vaccinated		Not vaccinated		Unknown	Total
	< 9 mos.	≥ 9 mos.	vaccinated	Unknown		
< 1	—	4	57	—	—	61
1-4	56	21	51	23	—	151
5-9	19	6	29	11	—	65
10-14	—	—	15	—	—	15
≥ 15	—	—	6	2	—	8
TOTAL	75	31	158	36	—	300

## Results

As the increase in measles incidence had begun several months before the survey, it was decided that the study would cover the first six months of 1983. The survey measured vaccination coverage on 31 December 1982, considered the beginning of the epidemic, and 30 June 1983. As shown in Table 1, coverage in children under 10 years of age had increased to 84 percent by the end of June. Coverage rates for each of the years between 1978 and 1981 (Table 2) were at least 60 percent, and had reached nearly 70 percent by the end of 1982 (Table 1).

<sup>1</sup> Questionnaires were adapted from models developed by consultant Alan Hinman in his report *Measles mortality and morbidity in Brazil*, December 1981.

Vaccine efficacy was calculated both for children who received vaccination before 9 months of age and for those who were vaccinated at 9 months or later, since prior to February 1982 the national immunization schedule had called for measles vaccination starting at 7 months of age.<sup>1</sup> The following formula was used in the calculation:

$$VE = \frac{AR \text{ in unvaccinated} - AR \text{ in vaccinated}}{AR \text{ in unvaccinated}} \times 100$$

where VE = vaccine efficacy and AR = attack rate.

<sup>1</sup> In 1973 the Ministry of Health had lowered the recommended age for measles vaccination to 8 months, and subsequently to 7 months, in an attempt to control the incidence of measles cases in children under 9 months of age. The strategy did not have the desired effect, however, and in February 1982 the recommended age for vaccination was raised to 9 months.

The data showed that vaccine efficacy was only 43 percent for children who received the vaccine before 9 months of age while it was 83 percent for children who were vaccinated later. Of the 300 measles cases investigated, 61 (20 percent) occurred in children less than 1 year of age. Of the 61 cases, 39 (64 percent) occurred in children less than 9 months of age while 57 (93 percent) were in unvaccinated children.

Although the total vaccination coverage of children 9 months to 9 years of age went from 68.4 to 84 percent between 31 December 1982 and 30 June 1983, the survey showed that coverage of children who had not previously had measles only increased from 50 to 55.4 percent. This explains why the increased measles vaccination was not effective in stopping the outbreak.

The source and site of transmission were identified for 30 of the 61 cases occurring in under 1-year-olds (Tables 4 and 5). In all but two cases the sources of infection were children older than 1 year, and transmission usually

TABLE 4. Age of source of infection for 30 measles cases in children less than 1 year of age. Planaltina (F.D.), Brazil, January - June 1983.

Age of source of infection	Number	Percent
9 months (a)	1	3.3
9-11 months (b)	1	3.3
1-4 years	18	60.0
5-9 years	4	13.3
≥ 10 years	6	20.0
TOTAL	30	99.9

(a) Resident of same household  
(b) Resident of neighboring household

TABLE 5. Site of transmission for 30 measles cases in children less than 1 year of age. Planaltina (F.D.), Brazil, January - June 1983.

Site of transmission	Number	Percent
Neighboring household	14	36.8
Same household	12	31.6
Hospital or clinic	8	21.1
Visitor	3	7.9
Day care center	1	2.6
TOTAL	38	100.0

occurred either in the individual's own or a neighboring household (60 percent), or in a hospital or polyclinic (20 percent).

### Control Measures

The intensification of measles vaccination that began in May 1983 was not effective in controlling the outbreak, despite the large number of doses applied and the high coverages which already existed. The number of children successfully immunized against measles was considerably lower than that indicated by the December 1982 vaccination coverage since the majority of children had received their vaccinations before reaching 9 months of age, when vaccine efficacy was quite low. Neither did the mass vaccination in May represent a significant increase in either vaccination coverage or immunity, since many of the children covered had already been vaccinated or had had measles.

As an immediate measure, the Ministry of Health recommended that measles vaccine be administered simultaneously with polio vaccine during the national polio immunization day on 13 August 1983. This plan was put into effect for the whole Federal District and a total of 62,756 children 9 months to 4 years of age (2,416 in Planaltina) were vaccinated at that time.

Source: *Boletim Epidemiológico* XV(16):129-137, 1983.

**Editorial note:** In February 1982 the Ministry of Health raised the recommended age for measles vaccination from 7 to 9 months. The results of the present investigation support this decision, in view of the low vaccine efficacy (43 percent) when administered prior to 9 months and the low transmission among children under 1 year of age. The findings also substantiate the conclusions of the collaborative Latin American study on the optimum age for measles vaccination in which Brazil took part.<sup>1</sup> Finally, the survey confirms the importance of identifying those population groups which are not being vaccinated. These groups are not only at highest risk of getting the disease, but also remain foci for transmission.

<sup>1</sup> "Seroconversion rates and measles antibody titers induced by measles vaccine in Latin American children 6-12 months of age. Collaborative study by the Ministries of Health of Brazil, Chile, Costa Rica, Ecuador, and the Pan American Health Organization." *Bulletin of the Pan American Health Organization* 16(3): 272-285, 1982.

## International Pediatrics Congress Promotes Immunization

A Pre-Congress Workshop on Immunization for the XVII International Congress of Pediatrics was held at the World Health Organization's Regional Office for the Western Pacific in Manila, Philippines, 6-7 November 1983. During the workshop technical papers were presented dealing with new vaccine developments and the

delivery of immunization services. The group then formulated specific conclusions and recommendations to promote the delivery of immunization services.

Among the major recommendations of the workshop were the following:

- The International Pediatric Association should en-

dorse the EPI as an element of primary health care and encourage regional and national societies throughout the world to assist in reaching the program's goal.

- Each country should have a national council or committee to make recommendations on national immunization policies. The committee should provide advice with respect to vaccines and immunization schedules recommended in the national program based on their review of the most recent knowledge concerning vaccine development and use, and should recommend national research priorities in their field.

- All post-graduate students should at least be sensitized to the importance of immunization and other preventive services. Continuing education of health workers, and training of nurses and midwives, are especially important. Uniform immunization policies should be taught in the training institutions of any one country or region.

- National groups responsible for establishing immunization policies should base their advice on a practical appraisal of the risks of the disease as well as the benefits and potential risks of immunization. The workshop specifically endorsed the guidelines formulated at the EPI Global Advisory Meeting in this respect.<sup>1</sup>

- All maternal and child health services should help promote immunization as a part of their normal duties and pool their resources appropriately to achieve effective coverage. Pediatricians themselves must take a leading role. Each child should have a chart kept at home which records immunization, growth and development.

- To prevent neonatal tetanus, pediatricians should work with obstetricians and other health care providers to assure that women of child-bearing age, especially pregnant women, are adequately immunized against tetanus.

- Data concerning both immunization coverage and disease incidence for all the target diseases should be avail-

able to staff at local and national levels to permit the effectiveness of the program to be monitored.

- School entry is a time when evidence of immunization can be required.

- Pediatricians should take the initiative in enlisting the support of community leaders in promoting immunization. Pediatricians should also become involved with the mass media (radio, television, newspapers, women's magazines) by preparing programs and articles to ensure that technically accurate and consistent information is communicated in terms the lay person understands. Uniform immunization policies should be adopted in any one country or region to avoid confusing the public.

- Pediatric societies should play a leading role in developing policies at the national level through active participation in policy-forming committees.

- Pediatricians should lend their support to basic vaccine research, field trials to evaluate new vaccines, and operational research to improve the application of existing vaccines.

*Source: XVII International Congress of Paediatrics, WHO/IPA Pre-Congress Workshop on Immunization, Conclusions and Recommendations, 7 November 1983, WHO document EPI/MISC/83/2.*

**Editorial note:** Many of the technical issues involved in the recommendations of the International Pediatrics Congress are addressed in PAHO's Scientific Publication No. 451 *Recent Advances in Immunization: A Bibliographic Review* (reviewed in *EPI Newsletter VI-1*, page 8).

English copies of this publication are available from Distribution and Sales, Pan American Health Organization, 525 Twenty-third St., N.W., Washington, D.C. 20037 (USA). For Spanish copies, readers should write to Servicio de Publicaciones y Documentación de la OPS/OMS, Apartado Postal 105-50, 11570 Mexico, D.F., Mexico.

<sup>1</sup> See "The EPI Vaccines: Indications and Contraindications, *EPI Newsletter VI-1* (February 1984).

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## EPI Global Advisory Group Recommendations on Disease Surveillance and Neonatal Tetanus Prevention

Disease surveillance and neonatal tetanus prevention were two of the major topics discussed at the EPI Global Advisory Group's sixth meeting, held in Manila from 31 October to 4 November 1983. The 12 members of the Group, representing all six WHO Regions, included the following conclusions and recommendations on these subjects in their final report.

### Disease Surveillance

"The EPI is concerned with the prevention of the target diseases, not merely with the administration of vaccine. In addition to working towards increases in immunization coverage, the EPI must assure the strengthening of surveillance systems so that the magnitude of the health problem

represented by the target diseases is known at community, district, regional and national levels, so that immunization strategies are continually evolved to reach groups at highest risk, and so that the target diseases are reduced to a minimum. The development of surveillance systems is one of the priorities in the development of effective primary health care services.

Disease surveillance in its various forms should be used at *all* management levels for monitoring immunization program performance and for measuring program impact. The purpose of such monitoring and evaluation is to improve the program, and action to investigate and solve the problems identified is required as an essential part of the surveillance process.

Surveillance systems must be sufficiently advanced by 1988 at the latest so that appropriate disease reduction targets can be established in all countries for the years of 1990 and beyond. First priority should be given to establishing or strengthening existing surveillance systems pertaining to cases of measles and polio and to deaths from neonatal tetanus.

In strengthening its support to national programs in the area of disease surveillance, the global EPI, in collaboration with the Regional Offices, should:

- 1) Develop and disseminate prototype case definitions for the EPI target diseases.
- 2) Develop and disseminate prototype forms and guidelines for investigation and control of disease outbreaks.
- 3) Strengthen the elements pertaining to disease surveillance in prototype materials developed for use in reviews and evaluations of national programs.
- 4) Support national research and development efforts concerning the further improvement and application of surveillance systems including:
  - sample survey techniques
  - sentinel surveillance systems
- 5) Continue to support the further development and dissemination of disease recognition materials.
- 6) Strengthen elements of EPI management training materials pertaining to disease surveillance on the basis of national experiences.
- 7) Help to develop or strengthen national disease reporting systems with regard to diseases preventable by immunization by:
  - encouraging that all six target diseases be designated as notifiable conditions;
  - encouraging that notification be limited to those disease conditions for which interventions are practicable;
  - encouraging that the reporting of tetanus distinguish between neonatal and non-neonatal tetanus.
- 8) Develop more effective mechanisms for surveillance of pertussis and diphtheria.
- 9) Develop practical means of measuring the impact of BCG immunization on the occurrence of tuberculosis in children.

At the national level, WHO should encourage actions necessary to:

- 1) Ensure that at all levels staff are identified, trained and assigned responsibility to strengthen program-related surveillance activities.
- 2) Establish procedures for surveillance of target diseases.
- 3) Assess the public health importance of target diseases in countries or areas where immunization against these diseases is not practiced.
- 4) Conduct surveys to assess the incidence of neonatal tetanus, as well as neonatal mortality rates, in countries or areas where accurate information is lacking.
- 5) Develop a policy of investigating and controlling outbreaks of vaccine-preventable diseases.
- 6) Ensure that surveillance data are analyzed, interpreted and acted upon at the peripheral level as well as at each higher level of program management.
- 7) Assess and help to improve national routine disease reporting systems."

**Editorial note:** The complete "Surveillance Guidelines for the Expanded Program on Immunization" were published in Spanish in the *Boletín de la OSP* Vol. 95, No. 3, September 1983. Readers interested in obtaining this publication should write either to the Servicio de Publicaciones y Documentación de la OPS/OMS, Apartado Postal 105-50, 11570 México, D.F., México, or to Distribution and Sales, Pan American Health Organization, 525 Twenty-third St., N.W., Washington, D.C. 20037 (EUA). A limited number of English copies are available from the *EPI Newsletter* editor.

## Neonatal Tetanus Prevention

"Some progress has been achieved in acting on the recommendations made at the Meeting on the Prevention of Neonatal Tetanus held in Lahore, Pakistan, in 1982.<sup>1</sup> Intensification of activities is required however, particularly in the following areas:

- 1) Additional surveys are required to assess the incidence of neonatal tetanus, since large geographic areas remain without any data: this should be remedied before the end of 1985.
- 2) Active neonatal tetanus control programs should be launched in selected countries of each Region utilizing the two-pronged attack of improved maternity care and immunization. Results of progress should be made available by the end of 1986.
- 3) The objective of tetanus toxoid immunization of women is to assure that no woman delivers a baby who is not protected against neonatal tetanus. This requires that emphasis be placed on immunizing future mothers, whether or not pregnant, at any time

<sup>1</sup> See *EPI Newsletter* V-3 (June 1983).



they come in contact with the health services. It is recommended that strategies and tactics to achieve this should be open-minded and innovative according to the circumstances of the particular country or society.

- 4) Increased cooperation and coordination is required from those responsible for both EPI and MCH at country, regional and global levels. The control of neonatal tetanus is a problem for the health services as a whole, and preventive actions should not be restricted within any single administrative entity.

It is suggested that a resolution confirming and consolidating the commitment to control neonatal tetanus as a part of the Health for All strategy should be presented, possibly in 1985, for consideration by the World Health Assembly."

Source: Report of the Expanded Program on Immunization Global Advisory Group Meeting, 31 October - 4 November 1983, Manila.



Many infants with neonatal tetanus die before receiving medical attention. Surveys based on interviews with mothers can help determine the true incidence of the disease.

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## Newsbriefs

### Polio Symposium Proceedings Published

The Proceedings of the 1983 International Symposium on Poliomyelitis Control have been published in the *Reviews of Infectious Diseases* (Volume 6, Supplement 2, May-June 1984).

The symposium was held at the Pan American Health Organization in Washington, D.C., from 14 to 17 March 1983.<sup>1</sup> Its primary objectives were to discuss poliomyelitis as a world problem, to explore ways in which control of the paralytic disease can be improved, to identify research needs, and to consider the feasibility of eventual elimination of the disease. Participants from some 50 countries reviewed and discussed a wide variety of subjects, ranging from practical problems in reaching susceptible children with vaccine, to the most recent investigations of the molecular biology of the virus. The papers, discussions and conclusions are presented in detail in the proceedings.

Requests for copies should be addressed to *Reviews of Infectious Diseases*, Journals Division, P.O. Box 37005, Chicago, Illinois 60637 (USA).

### Polio Vaccine Price Change

The price of polio vaccine in 50-dose vials purchased through the EPI Revolving Fund in 1984 has been changed to .017 cents per dose, due to a change in supplier. All other 1984 vaccine prices remain the same.

<sup>1</sup> A summary of the polio symposium discussions and recommendations was published in *EPI Newsletter* V-3 (June 1983).

### Saint Lucia Sets 1985 EPI Targets

Saint Lucia has established 1985 targets for coverage with measles and BCG vaccines. The country will aim to cover 70 percent of its children under 1 year of age with measles vaccine and 80 percent with BCG. These figures were not available in time to be included in the table of 1985 coverage targets for Caribbean countries and territories, published in *EPI Newsletter* VI-1 (February 1984).

### New Publication on Maternal and Child Health

A new publication entitled *Maternal and Child Health and Primary Health Care in the Americas* is now available in Spanish from the Pan American Health Organization. The 348 page book includes articles by various authors on risk approach, psychosocial problems, primary health care during pregnancy and birth, nutrition of pregnant and lactating women and infants, growth monitoring, prevention of diseases by immunization, prevention and treatment of diarrhoea, family planning and demographic projections.

Readers interested in obtaining the Spanish-language publication should request PAHO Scientific Publication No. 461 from the Servicio de Publicaciones y Documentación de la OPS/OMS, Apartado Postal 105-50, 11570 México, D.F., México, or to Distribution and Sales, Pan American Health Organization, 525 Twenty-third St., N.W., Washington, D.C. 20037 (EUA).

## Reported Cases of EPI Diseases

Number of reported cases of measles, poliomyelitis, tetanus, diphtheria and whooping cough, from 1 January 1984 to date of last report, and for same epidemiological period in 1983, by country

Subregion and Country	Date of last report	Measles		Poliomyelitis		Tetanus				Diphtheria		Whooping Cough	
		1984	1983	1984	1983	Non-neonatorum		Neonatorum		1984	1983	1984	1983
						1984	1983	1984	1983				
<b>NORTHERN AMERICA</b>													
Canada	17 Mar.	647	220	—	—	—	—	...	...	1	6	316	502
United States	2 Jun.	1,420	857	1	1	13	18	...	...	—	—	846	753
<b>CARIBBEAN</b>													
Antigua and Barbuda	3 Mar.	1	1	—	—	—	—	—	—	—	—	—	—
Bahamas	12 May	16	1,931	—	—	1	—	—	—	—	—	—	7
Barbados	7 Apr.	2	3	—	—	—	4	—	—	—	—	—	—
Cuba	24 Mar.	1,099	991	—	—	—	—	—	—	—	—	30	87
Dominica	28 Apr.	—	—	—	—	—	—	—	—	—	—	—	10
Dominican Republic	28 Feb.	413	404	—	4	16	16	1	5	31	18	26	29
Grenada	5 May	4	248	—	—	—	—	—	—	—	—	—	—
Haiti	*	...	...	...	...	...	...	...	...	...	...	...	...
Jamaica	14 Apr.	66	720	—	—	—	2	1	—	3	7	1	23
Saint Lucia	7 Apr.	5	43	—	—	—	1	...	...	—	—	—	—
St. Vincent and the Grenadines	3 Mar.	4	25	...	...	...	...	...	...	...	...	...	...
Trinidad and Tobago	21 Apr.	2,145	901	—	—	—	8	—	—	—	—	—	—
<b>CONTINENTAL MIDDLE AMERICA</b>													
Belize	7 Apr.	—	5	—	—	—	—	—	—	—	—	—	1
Costa Rica	5 May	—	8	—	—	3	1	—	—	—	—	79	9
El Salvador	3 Mar.	581	346	14	14	16	8	3	5	5	7	47	88
Guatemala	31 Mar.	868	867	5	31	28	30	...	...	2	6	450	297
Honduras	5 May	280	561	3	3	5	14	2	—	—	—	132	220
Mexico	*	...	...	...	...	...	...	...	...	...	...	...	...
Nicaragua	31 Mar.	49	35	—	—	...	39	...	...	3	—	20	20
Panama	31 Mar.	109	264	—	—	1	...	2	...	—	—	56	41
<b>TROPICAL SOUTH AMERICA</b>													
Bolivia	*	...	...	...	...	...	...	...	...	...	...	...	...
Brazil	28 Jan.	3,939	2,494	—	3	166	180	38	7	174	187	1,418	2,960
Colombia	*	...	...	...	...	...	...	...	...	...	...	...	...
Ecuador	*	...	...	...	...	...	...	...	...	...	...	...	...
Guyana	*	...	...	...	...	...	...	...	...	...	...	...	...
Paraguay	7 Apr.	100	137	—	74	17	10	11	19	2	1	101	69
Peru	*	...	...	...	...	...	...	...	...	...	...	...	...
Suriname	28 Jan.	3	5	—	—	1	...	—	...	—	—	—	—
Venezuela	18 Feb.	1,290	1,221	—	—	...	...	...	...	—	—	190	272
<b>TEMPERATE SOUTH AMERICA</b>													
Argentina	31 Mar.	998	374	...	—	51	...	...	...	1	5	3,257	5,303
Chile	12 May	1,153	1,342	—	—	15	13	...	...	31	36	151	66
Uruguay	31 Mar.	—	—	—	—	3	—	—	—	—	—	33	158

\* No 1984 reports received, therefore 1983 data not shown.

— No cases  
... Data not available

# Update on National EPI Managers

The persons responsible for managing the EPI in the countries and territories of the Americas are shown in the

following table. Any corrections to the list should be made known to the *EPI Newsletter* editor.

## National EPI Managers in the Region of the Americas, 1984

### NORTH AMERICA

Canada J.W. Davies  
United States Alan Hinman

### CARIBBEAN

Anguilla Vida Lloyd  
Antigua and Barbuda Ineta Wallace  
Bahamas Fredrica Sands  
Barbados Beverley Miller  
Helena Millington,  
Ass't. EPI Mgr.  
Bermuda Diane Simons  
British Virgin Islands Tatica Scatliffe  
Cayman Islands Jacqueline Creary  
Cuba Miguel Galindo  
Dominica Jean Jacob  
Dominican Republic Josefina Martínez  
Grenada Cynthia Telesford  
Haiti Marie-Alix Laraque  
Jamaica Deanna Ashley  
Montserrat Florence Daley  
Saint Lucia Elritha Philippe  
St. Kitts and Nevis D. Francis-Delaney  
St. Vincent and the  
Grenadines Vernie Bowman  
Trinidad and Tobago Norma Andrews  
Hilary Seaton, Ass't. EPI Mgr.  
Turks and Caicos Is. Thelma Osborn

### CONTINENTAL MIDDLE AMERICA

Belize Grace Collymore  
Costa Rica Emilia León de Coto  
El Salvador Rolando Hernández Argueta  
Guatemala Otto Zeissig Bocanegra  
Honduras Roberto Cruz Gavidia  
México Blanca Raquel Ordóñez de la Mora  
Nicaragua Jaime Manzanares  
Panamá Gloria Graciela García

### TROPICAL SOUTH AMERICA

Bolivia Enrique Lavadenz  
Brazil Ivanildo Tajra Franzosi  
Colombia Enrique Silva  
Ecuador Oscar Oswaldo Barrezueta  
Guyana Udit Narine  
Enid Cholmondeley, Ass't EPI Mgr.  
Paraguay Fidel Moreno González  
Peru Luz Filomeno de Arce  
Suriname Welsly M.J. Bodha  
Venezuela Rafael Travieso

### TEMPERATE SOUTH AMERICA

Argentina Norma Pia del Punta  
Chile Héctor Rodríguez  
Uruguay Marta Burgos

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