

# EPI Newsletter

## Expanded Program on Immunization in the Americas

Volume XVII, Number 6 IMMUNIZE AND PROTECT YOUR CHILDREN

December 1995

### First Ladies of the Americas Reaffirm Commitment to Measles Elimination

During the *Fifth Conference of the Wives of Heads of State and of Government of the Americas*, held in the city of Asuncion, Paraguay, on October 16-19, 1995, the First Ladies of the Western Hemisphere reiterated their commitment to work in favor of the health and education of women and children, under the principles of comprehensive development, equity, democratization of information and awareness, and family and social participation.

"We recognize that our countries face common challenges regarding the health and education of women and children, and that by sharing experiences and promoting regional actions through these conferences, we can foster the development and the well-being of our nations," the First Ladies' Declaration of Paraguay stated.

Particular attention was placed on strengthening the Region's efforts to reduce maternal and child morbidity and mortality rates. Each year nearly 500,000 children under 1 year old die in Latin America and the Caribbean, of which approximately 350,000 die from preventable causes. There are also some 17,000 maternal deaths each year. Within the framework of

each country's national interest and legislation, the First Ladies encouraged and supported the implementation of the agreements and recommendations reached at the World Summit for Children, the United Nations International Conference on Population and Development, the Summit of the Americas, the United Nations World Summit on Social Development, and the United Nations Fourth World Conference on Women.

The official Declaration made specific reference to attaining the goal to eliminate measles in the Americas by the year 2000. The First Ladies pledged to "work with Ministries of Health, the Pan American Health Organization (PAHO), and other international organizations on the campaign to eliminate measles transmission from the Americas by the year 2000, and strengthen the surveillance of vaccine-preventable diseases."

Other recommendations included a call to further promote women's and girls' access to formal and non-formal education, especially in poor rural areas and marginalized urban areas, and to contribute to the prevention and elimination of all



The First Ladies of the United States, Mrs. Hillary Rodham Clinton, and of Paraguay, Mrs. Teresa de Wasmosy, hold a girl who is being immunized against measles. The event marked the beginning of the measles campaign in Paraguay. Source: *Noticias*, Asuncion, Paraguay.

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forms of violence against women and children through the provision of norms and adoption of necessary mechanisms.

The First Lady of Panama presented a Plan of Action to follow up the Region's current efforts towards the elimination of measles. During her presentation, the following messages were stressed:

**Measles is highly dangerous!**

- It attacks 100% of all unimmunized children
- It can kill 10-20% of those who have contracted the disease
- A 30% of all cases develop complications:

Otitis media	Conjunctivitis
Diarrhea	Malnutrition
Encephalitis	Death

The Plan of Action proposes that each First Lady implement the following steps in their own country:

**Step 1:** Guarantee the purchase of vaccines and the cold chain in every country.

Action to be taken:

- Ensure the allocation of specific funds within the national budgets.

**Step 2:** Guarantee the participation of civil society.

Action to be taken:

- Establish and chair national surveillance committees for the eradication of measles which would include:

- Government officials
- Local authorities
- Organized communities
- Civic organizations
- Churches
- Non governmental organizations
- International agencies

**Step 3:** Evaluate the progress of national objectives.

Action to be taken:

- Evaluate and analyze progress reports on a quarterly basis.

**Step 4:** Accompany the processes of regional campaigns.

Action to be taken:

- Present biannual reports to the pro-tempore Secretariat.
- Maintain the topic on the agenda until the goal is reached.

**Step 5:** Disseminate this commitment on a national and international level.

Action to be taken:

- The *Fifth Conference of Wives of Heads of State and of Government of the Americas* recommends that this strategy be a national priority in the countries.

**Only then, will we have the Americas Free of Measles!**

The First Ladies of the Americas agreed to hold their 6th Conference in the Republic of Bolivia in 1996, and to form a new pro-tempore Secretariat composed of the offices of the First Ladies of Bolivia, Paraguay and Panama.

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## WHO Reiterates Support of Oral Polio Vaccine

"The eradication from the world can only be achieved using oral polio vaccine," said Dr. Jong-Wook Lee, Director of the Global Program for Vaccines, commenting on a decision by the Centers for Disease Control and Prevention (CDC) in the United States of America to recommend adding two doses of injectable polio vaccine (IPV) to the national immunization schedule.

"The core group working towards global polio eradication, the World Health Organization (WHO), the United Nations Children's Fund (UNICEF), CDC and Rotary International, emphasize that oral polio vaccine (OPV) is recommended because it can provide both individual protection to each child, as well as prevent the spread of the poliovirus to other children," points out Dr. Lee. At US\$ 0.08 per dose, the cost of a single dose of OPV procured by UNICEF is less than one tenth the cost of a dose of IPV.

The Advisory Committee on Immunization Practices

(ACIP) statement applies only to the United States where the last case of naturally occurring polio was registered more than 15 years ago. WHO reaffirms its position that OPV alone is the basis for the global eradication of polio, and that the addition of IPV is neither necessary nor recommended for this purpose.

The ACIP meeting at the Centers for Disease Control voted on Wednesday [October 18], to change the immunization schedule in the United States to two doses of injectable polio vaccine and two doses of oral polio vaccine. In their recommendation, the ACIP affirmed its support for WHO's initiative to eradicate polio and noted that the eradication of polio was achieved in the United States through the exclusive use of the oral polio vaccine.

"The change in ACIP's position seems to be based on fears of polio caused by the vaccine," says Dr. Lee. "Vaccine associated polio occurs at a rate of about one case per three

million doses administered.” The new ACIP strategy will prevent only about half of the five to ten cases of vaccine associated polio in the United States each year at a cost of approximately US \$20 million.

WHO estimates that as many as 100,000 cases of polio occurred worldwide in 1994. The initiative to eradicate polio seeks to destroy totally the wild (naturally occurring) polio virus from the entire world by the year 2000. When the disease is eradicated, immunization against polio will no

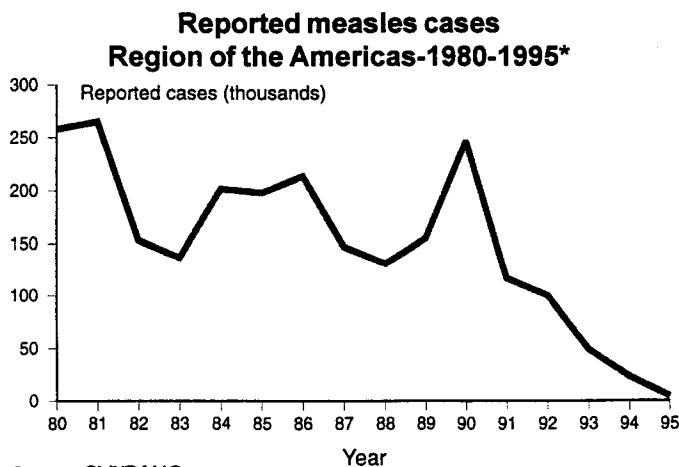
longer be necessary. The United States will save at least US\$ 230 million each year after polio is eradicated and immunization is stopped. The global savings from polio eradication are expected to total at least US\$ 1.5 billion per year.

Source: Press Release WHO/76/October 20, 1995.

**Editorial note:** OPV was the only vaccine used to eradicate polio in the Americas and PAHO re-states its recommendation that OPV continues to be the vaccine of choice for maintaining the Americas free of polio.

## Measles at an All Time Low in the Americas

As of 25 November 1995, a total of 4,551 confirmed cases (including both clinical and laboratory diagnosed cases) were reported from the countries of the Americas, compared to 23,583 in 1994. This is the lowest number of cases reported since measles surveillance began. Record low levels of measles cases have been reported from nearly every country of the Region. The provisional annual measles incidence rate was 0.48 cases per 100,000 population; this represents a 99% reduction from the incidence rate reported in 1980. Furthermore, in over twelve months there has not been a single confirmed importation of measles from Latin America and the Caribbean into the United States, another important indicator of control of the disease in those areas. Current efforts are targeting the improvement of measles surveillance and that of laboratory diagnosis.



The majority of the total confirmed cases, 2,266 (49.7%) came from Canada. An additional 827 cases (18.6%) were reported from Ecuador. In the Region, over half of the total confirmed cases, and nearly 80% of the laboratory confirmed cases were reported from Canada. The overwhelming majority of Canada’s cases were reported from the province of Ontario. Similarly, the highest national incidence rates were also found in these two countries (Canada, 8.0 cases per 100,000 population and Ecuador, 7.2 cases per 100,000 population).

Other countries reporting low rates included Brazil, Mexico, and those of the Latin and English-speaking Caribbean.

Of the 41 countries which submit weekly measles surveillance reports to PAHO, 21 (51.2%) did not report a single confirmed case of measles during 1995. In these countries, a total of 714 persons presenting fever and rash illnesses were fully investigated and none had laboratory evidence of measles virus infection.

Furthermore, it has been over 4 years since the last laboratory confirmed case was reported from the English-speaking Caribbean and over 3 years since the last laboratory confirmed case was reported from Chile and Cuba.

**Editorial note:** Data from regional measles surveillance provide strong evidence that the transmission of the measles virus has been greatly reduced, if not eliminated, in virtually all the Region. These data clearly represent the impact of the “catch-up” measles vaccination campaigns, which, by the end of 1995, will have been conducted in all countries of the Region, with the exception of the United States and Canada.

Despite vaccination coverage of nearly 100%, measles transmission has continued to occur among school-aged children in Canada. To reduce measles susceptibility in this age group, health authorities are discussing possible remedial vaccination strategies. Options include conducting a “catch-up” campaign among school-aged children, introduction of a two-dose measles vaccination schedule, or a combination of both strategies.

Although the circulation of the measles virus has been reduced to record low levels in the Western Hemisphere, it continues to circulate freely in other parts of the world. In the age of rapid intercontinental travel, the risk of measles importations will remain a constant threat. To achieve the regional goal of the elimination of measles transmission from the Americas by the year 2000, all countries must keep routine vaccination of each successive birth cohort to maintain high levels of population immunity, supplemented with periodic “follow-up” measles vaccination campaigns among pre-school-aged children.

# Ensuring the Production of Vaccines in the Region

The Region of the Americas has made significant progress in the control and/or elimination of vaccine-preventable diseases. Despite these advances, few governments in Latin America and the Caribbean are in the position to make large investments in new installations and modern equipment with a view to becoming self-sufficient in the supply of essential vaccines. Many of the Region's existing vaccine-producing laboratories, which in the vast majority are publicly owned, do not meet internationally established requirements, nor do all vaccines-producing countries have an adequate national system for quality control. The quality and effectiveness of certain existing vaccines need to be improved, while other vaccines developed recently, in the Region have costs that go beyond the reach of immunization programs.

In an effort to respond to these challenges, the Pan American Health Organization assembled a group of experts in 1988, to search for ways to develop new vaccines and improve existing ones. From these initial discussions, and following a series of feasibility studies, the Regional System for Vaccines (SIREVA) emerged in 1993 at PAHO. Since its inception, SIREVA has contributed to strengthening the Region's real and potential capacity for development, production, quality control, and evaluation of effective immunizing agents for use by Member States in their immunization programs. Technical cooperation activities are being carried out under the umbrella of PAHO's Special Program for Vaccines and Immunization (SVI) by means of collaborative projects, joint action networks or consortiums of scientific and technological institutions formed by agreements, alliances, and arrangements.

Through this regional initiative, PAHO is implementing a global approach to vaccine development that involves systematic execution of all required phases in this process: epidemiological research and surveillance, basic research, technological development, pilot-scale production, quality control, and clinical and field trials. A Master Plan for each selected vaccine, developed by a technical advisory group specifically designated for this task, serves as the basis for the coordination and implementation of the several phases related to vaccine development. With regard to production activity, the strategy is supported by the certification program for production laboratories, which provides technical advisory services on how to adopt procedures and meet other technical requirements that guarantee the quality of the vaccine produced.

SIREVA also provides mechanisms for accelerating the process of research, development, production, and quality control of vaccines so that vaccines of guaranteed quality can be provided more quickly and at a lower cost. It further creates an enabling environment for all the countries in the Region to participate in and benefit from these processes.

Throughout the years, this initiative has received the support of the Government of Mexico, the Rockefeller

Foundation, the Inter-American Development Bank, the World Bank, UNICEF, UNDP, and the International Development Research Center (IDRC, Canada). It has been equally endorsed by the Members of PAHO's Executive Committee during their 1990 and 1993 meetings. The Children's Vaccine Initiative (CVI), which was launched in 1990 at the World Summit for Children in New York and is housed at WHO, has also stated its support of the Americas' initiative stating that, "as the CVI gathers momentum, additional special regional priorities with the potential to become regional initiatives for vaccine development will be identified, like the SIREVA initiative in the Americas." SVI/PAHO serves as the focal point for CVI activities in the Region of the Americas.

## Current Activities

Presently, SVI/PAHO is carrying out several projects in the areas of quality control, research and development of vaccines, certification of vaccine producers, and epidemiological research associated with vaccines.

A Regional Network of Vaccine Quality Control Laboratories has been established to assure the quality of vaccines used throughout the Region. A collaborative program has been implemented for the development of regional reference reagents. Furthermore, a newly-established communications network seeks to improve communication and facilitate day-to-day activities.

Brazil, Chile and Mexico are participating in a multi-country program to develop a conjugated vaccine against *Salmonella typhi*. Brazil is contributing with the technology for polysaccharide preparation and purification. Mexico is working on the preparation of the protein components, and Chile is performing the conjugation process. A multi-institutional effort is being conducted in Brazil to develop an improved meningococcal Group B vaccine based on outer membrane proteins. Steps are also being taken to develop *H. influenzae* type b and meningococcal conjugated vaccines.

A program to certify vaccine producers has been initiated to ensure that vaccine production within the Region is carried out according to Good Manufacturing Practices (GMP). The goal is to optimize regional vaccine production through a Technical Cooperation Agreement among public vaccine producers to transfer technology, standardization of methodologies, and to expedite shared production.

Other activities include an epidemiological surveillance study for serotype distribution of *Streptococcus pneumoniae* in Argentina, Brazil, Chile, Colombia, Mexico and Uruguay, to establish the formulation of an appropriate vaccine for the Region. Simultaneously, a self-supporting surveillance system is being implemented to monitor pneumococcal disease, and a Phase III clinical study is being carried out in Arequipa, Peru to evaluate the efficacy of a cholera vaccine.

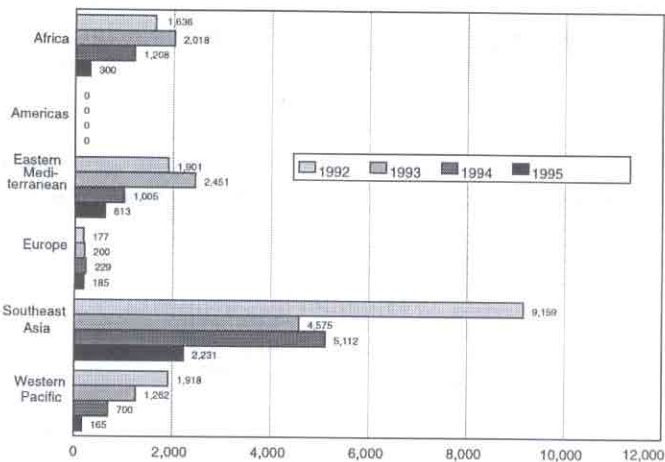


# Polio Surveillance

## Maintaining a Polio Free Region

The global incidence of polio has decreased dramatically. By 1994, in 145 (74%) of the 197 countries or territories reporting to WHO, there was not a single case of polio reported. The year 2000 has been set as the target for global poliomyelitis eradication by the World Health Assembly.

**Figure 1**  
Reported annual incidence of poliomyelitis by Region, 1992-1995\*



\*Data as of 5 Dec. 1995 - Source: GPV/EPI/WHO

Total number of cases have plunged, from about 35,000 reported cases in 1988 to just over 9,000 last year and 4,000 cases in 1995. Of these 4,000 reported cases, 2,170 come from India alone (Figure 1). However, in December, India is carrying out its first National Immunization Day, involving 75 million children. The global strategy continues to focus on maintaining current routine immunization coverage rates, nationwide campaigns, known as National Immunization Days, and in bolstering disease surveillance.

**Figure 2**  
AFP Surveillance Indicators

Country	80% Weekly Reporting Units	80% of cases Investigated in 48 hours	80% of cases with 2 adequate stool samples taken	AFP Rate $\geq 1/100,000$ for children < 15
Bolivia				
Colombia				
Dominican Republic				
El Salvador				
Honduras				
Nicaragua				
Paraguay				
Venezuela				
Chile				
Costa Rica				
Cuba				
Ecuador				
Mexico				
Peru				
Brazil				
Panama				
Argentina				
Guatemala				
Uruguay				
Haiti		--	--	--

■ Meet criteria;                      N.R. No Report Received;  
- Zero Cases                            \* Data as of November 25

Source: EPI/PAHO (PESS)

As long as the rest of the world is not polio free, the threat of importations of wild poliovirus remains. Therefore, the Region of the Americas will continue emphasizing sensitive surveillance systems that can promptly detect possible areas of circulation of wild poliovirus, as well as follow-ups of all reported cases of acute flaccid paralysis. Figure 2 shows the AFP surveillance indicators for the Region of the Americas for 1995.

## Diphtheria Epidemic in Eastern Europe

Diphtheria was thought to have been wiped out during the last decades, however the diphtheria epidemic, which started in the Russian Federation in 1990, and soon spread to all other newly-independent states of the former Soviet Union (NIS), continues to threaten the health of populations all over Europe. Between 1 January and 30 April 1995, some 20,000 cases of diphtheria have been reported in all NIS, more than twice the number reported for the same period in 1994. However the percentage of cases ending in death has dropped. The resurgence of this disease is blamed primarily on inadequate vaccination programs and population migration. In 1994, 47,261 cases and 1,742 deaths were reported. That was an increase of 250% over 1993. Some countries - Finland, Germany, Norway, and Poland - had cases imported by travellers from the NIS. WHO predicts that by the end of 1995, 100,000 to 200,000 cases may occur in the NIS and neighboring countries.

On June 19, 1995, WHO, the International Federation of the Red Cross and Red Crescent Societies (IFRC), and the United Nations Children's Fund (UNICEF) appealed to the international community for US\$ 33 million for the control of diphtheria. Pledges amounting to US\$ 9 million have already been received. For the first time, the IFRC is becoming involved in emergency prevention through immunization besides emergency response.

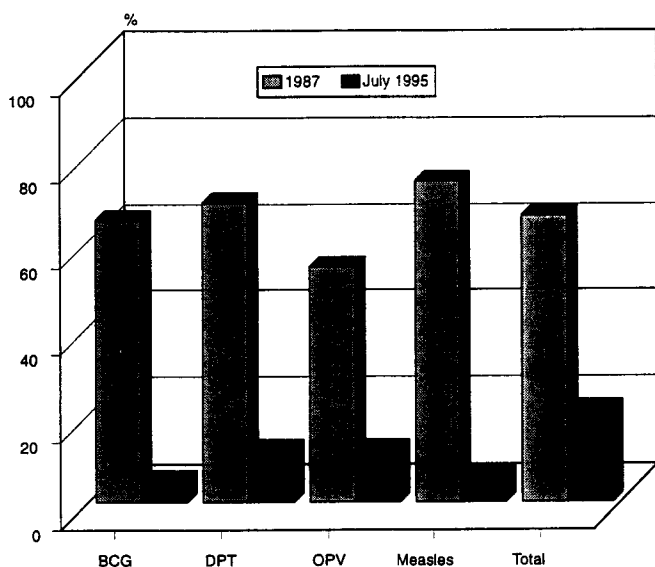
Source: World Health Organization/Regional Office for Europe.

**Editorial note:** The present outbreak of diphtheria in Eastern Europe demonstrates the constant threat of this disease once immunization levels drop. In the Americas, diphtheria has emerged in Ecuador and Canada (see *EPI Newsletter*, Volume XVI, No. 5), which stresses the need for maintenance of high levels of coverage with DPT vaccine. PAHO is also recommending that countries that use Tetanus Toxoid (TT), switch to Tetanus Toxoid combined with Diphtheria Toxoid (dT), to boost immunization against this disease.

# Nicaragua: Strategies to Reduce Missed Opportunities to Vaccinate

Over the past years Nicaragua has made considerable progress in expanding the country's vaccination coverage with all EPI antigens through its national immunization programs, complemented by national and local vaccination campaigns. However, in order to achieve the control and eradication of vaccine-preventable diseases and to guarantee their maintenance, the country is taking a series of concrete steps aimed at strengthening the regular immunization program.

**Figure 1**  
Missed Opportunities by Vaccine Type  
Children < 2 Years of Age  
Nicaragua, 1987 and July 1995



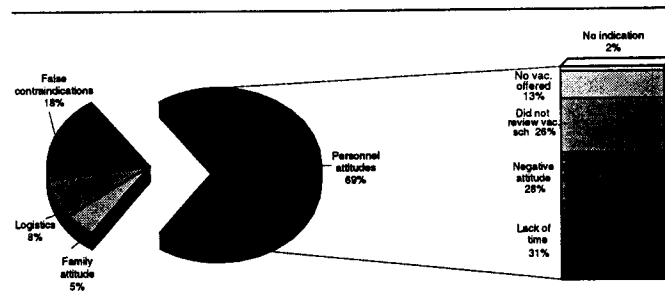
As part of this effort, Nicaragua's Ministry of Health sponsored a study of missed opportunities to vaccinate children less than two-years old and women of childbearing age (WCBA) in July 1995, as a follow up of a similar study performed in 1987. The current study evaluated the impact of missed opportunities in Nicaragua and the causes. It included 2,217 surveys of mothers of children less than two-years old and 5,929 surveys among women of childbearing age at 59 health centers. Specifically, the study sought to:

- determine the percentage of missed opportunities to vaccinate children under two years of age and among women of childbearing age
- ascertain the causes that lead to missed opportunities
- identify the community's rejection of the tetanus toxoid vaccine
- develop strategies to reduce missed opportunities.

## Results

A decrease was observed (Figure 1) in the percentage of missed opportunities by vaccine type among children less than two years of age in the 1987 and 1995 studies. The Nicaraguan study also found that 21% of missed opportunities occur among children less than two years of age. As shown in Figure 2, the main causes for missed opportunities in this age group were identified as the attitude of health workers (69%), false contraindications (18%), logistics (8%) and family attitude (5%). Still, these figures constitute an important decrease when compared to an overall 66% of missed opportunities found in the same group during the 1987 study.

**Figure 2**  
Causes of Missed Opportunities  
for Children > 2 Years of Age  
Nicaragua, July 1995



Among women of childbearing age (WCBA), the study indicated that of all WCBA visiting health facilities, 13% were not vaccinated (this was not studied in 1987). The principal causes were determined as: the attitude of health staff (78%) and that of family (17%). The latter cause pointed specifically to a rejection of the tetanus toxoid vaccine among women of childbearing age.

Immediate actions taken by Nicaragua's Ministry of Health at health centers include: actively involving all health personnel in the efforts to eliminate missed opportunities to vaccinate; strengthening the knowledge of health workers on false contraindications; maintaining an adequate supply of vaccines and syringes; placing vaccination sections at highly-visible locations and implementing flexible work hours at health centers; monitoring vaccination coverage on a regular basis in a given area; educating the community about vaccination schedules and cards; and initiating health promotion activities.

Source: Study of Missed Opportunities to Vaccinate. August, 1995, Ministry of Health, Nicaragua.

# Reported Cases of Selected Diseases

Number of reported cases of measles, poliomyelitis, tetanus, diphtheria, and whooping cough, from 1 January 1995 to date of last report, and the same epidemiological period in 1994, by country.

Country/Territory	Date of last report	Measles			Confirmed 1994	Polio		Tetanus				Diphtheria		Whooping Cough	
		Confirmed 1995				1995	1994	Non Neonatal		Neonatal		1995	1994	1995	1994
		Labo- ratory	Clini- cally	Total	1995			1994	1995	1994	1995				
Anguilla	25 Nov	0	0	0	0	0	0	...	...	...	...	...	...	...	...
Antigua & Barbuda	25 Nov	0	1	1	0	0	0	0	0	0	0	0	0	0	0
Argentina	11 Nov	8	127	135	65	0	0	28	19	5	11	2	3	1,001	1,031
Bahamas	25 Nov	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Barbados	25 Nov	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Belize	25 Nov	0	0	0	0	0	0	...	...	...	...	...	...	...	...
Bermuda	25 Nov	0	0	0	0	0	0	0	0	0	0	0	0	0	3
Bolivia	11 Nov	0	0	0	577	0	0	...	...	11	12	4	5	30	45
Brazil	23 Sept	2	232	234	36	0	0	...	423	...	76	...	120	...	1,495
British Virgin Islands	25 Nov	0	0	0	0	0	0	...	...	...	...	...	...	...	...
Canada	25 Nov	2,266	...	2,266	492	0	0	1	1	...	0	2	0	4,663	2,302
Cayman Islands	25 Nov	0	0	0	0	0	0	...	...	...	...	...	...	...	...
Chile	04 Nov	0	0	0	0	0	0	...	7	...	1	...	4	...	130
Colombia	25 Nov	157	125	282	477	0	0	...	11	...	...	...	9	...	489
Costa Rica	25 Nov	14	62	76	0	0	0	...	2	...	0	...	0	...	10
Cuba	25 Nov	0	1	1	0	0	0	...	2	...	0	...	0	...	0
Dominica	25 Nov	0	0	0	0	0	0	...	...	...	...	...	...	...	...
Dominican Republic	11 Nov	0	0	0	3	0	0	9	...	0	4	3	1	0	9
Ecuador	28 Oct	...	827	827	3,302	0	0	...	...	28	26	124	472	133	276
El Salvador	11 Nov	0	0	0	0	0	0	3	8	3	4	0	0	4	6
French Guiana	07 Jan	...	...	...	...	0	0	...	...	...	...	...	...	...	...
Grenada	25 Nov	0	0	0	0	0	0	...	...	...	...	...	...	...	...
Guadeloupe	07 Jan	...	...	...	...	0	0	...	...	...	...	...	...	...	...
Guatemala	12 Aug	25	1	26	204	0	0	...	...	4	6	0	...	20	36
Guyana	25 Nov	0	0	0	0	0	0	...	...	...	...	...	...	...	...
Haiti	07 Jan	...	...	...	...	0	0	...	...	...	...	...	...	...	...
Honduras	11 Nov	1	0	1	6	0	0	7	1	2	3	0	0	0	2
Jamaica	25 Nov	0	7	7	0	0	0	...	2	...	0	...	1	...	2
Martinique	28 Jan	...	...	...	1	0	0	0	0	0	0	0	0	0	0
Mexico	25 Nov	11	68	79	98	0	0	97	105	54	63	0	0	16	243
Montserrat	25 Nov	0	0	0	0	0	0	...	...	...	...	...	...	...	...
Netherlands Antilles	07 Jan	...	...	...	...	0	0	...	...	...	...	...	...	...	...
Nicaragua	25 Nov	0	0	0	1	0	0	2	...	2	...	0	...	3	...
Panama	25 Nov	3	5	8	2	0	0	0	5	0	2	0	0	3	191
Paraguay	25 Nov	3	38	41	103	0	0	...	30	...	14	...	1	...	42
Peru	09 Sept	28	171	199	520	0	0	37	63	55	88	2	34	632	1,030
Puerto Rico	25 Nov	11	...	11	13	0	0	...	...	...	...	...	...	...	...
Saint Lucia	25 Nov	0	2	2	0	0	0	...	...	...	...	...	...	...	...
St. Kitts/Nevis	25 Nov	0	1	1	0	0	0	...	...	...	...	...	...	...	...
St. Vincent	25 Nov	0	0	0	0	0	0	...	...	...	...	...	...	...	...
Suriname	25 Nov	0	0	0	0	0	0	...	...	...	...	...	...	...	...
Trinidad & Tobago	25 Nov	0	0	0	0	0	0	0	0	0	0	0	0	0	5
Turks and Caicos	25 Nov	0	0	0	0	0	0	...	...	...	...	...	...	...	...
United States	25 Nov	283	...	283	863	0	0	4	34	...	...	0	1	625	3,135
Uruguay	25 Nov	...	5	5	11	0	0	...	2	...	0	...	0	...	9
Venezuela	07 Oct	30	36	66	14,901	0	0	28	...	9	10	0	0	289	617
<b>TOTAL</b>		<b>2,842</b>	<b>1,709</b>	<b>4,551</b>	<b>21,675</b>	<b>0</b>	<b>0</b>	<b>216</b>	<b>715</b>	<b>173</b>	<b>320</b>	<b>137</b>	<b>651</b>	<b>7,419</b>	<b>11,108</b>

... Data not available.



## Dr. Saul Krugman: In Memoriam

Dr. Saul Krugman, a leader in the development of vaccines against measles, rubella and hepatitis died on October 27, in New York, at the age of 84. Dr. Krugman, the author of well over 200 scientific papers, received many honors in the United States and abroad, including a medical research award for public service in 1983 from the Albert and Mary Lasker Foundation. He is best known for his pivotal role in creating a vaccine against the hepatitis B virus. Dr. Krugman's field trials also proved the effectiveness of the first vaccine against rubella in 1969, and he led the way with tests gaining the approval and wide use of the first vaccine against measles. Among his numerous publications, Dr. Krugman co-authored *Infectious Diseases of Children*, considered a classic textbook by medical experts.



that led to the present strategy for measles elimination in the Americas recommended by PAHO.

The son of immigrant parents from Russia, he did his undergraduate work at Ohio State University and the University of Richmond and received his medical degree at the Medical College of Virginia in 1939. During World War II, Dr. Krugman spent four years as a wartime flight surgeon. He joined the New York University School of Medicine faculty in 1946, as an instructor in pediatrics and remained there for the next 47 years. He rose to associate professor by 1956, and was promoted to full professor in 1960.

Dr. Krugman is survived by his wife of 55 years, a daughter and two sons, one of them dean of the University of Colorado Medical School.

Dr. Krugman collaborated with PAHO extensively, consulting on activities related to measles control and elimination. He also participated in the initial discussions

Based on an article from *The New York Times*, New York, USA, 28 October 1995.

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The *EPI Newsletter* is published every two months, in Spanish and English by the Special Program for Vaccines and Immunization (SVI) of the Pan American Health Organization (PAHO), Regional Office for the Americas of the World Health Organization (WHO). Its purpose is to facilitate the exchange of ideas and information concerning immunization programs in the Region, in order to promote greater knowledge of the problems faced and their possible solutions.

References to commercial products and the publication of signed articles in this *Newsletter* do not constitute endorsement by PAHO/WHO, nor do they necessarily represent the policy of the Organization.



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