EPI Newsletter

Expanded Program on Immunization in the Americas

Volume XVII, Number 4 **IMMUNIZE AND PROTECT YOUR CHILDREN** August 1995

PAHO Measles Laboratory Network Workshop

From the 22 to 26 of May, 1995, PAHO and the Centers for Disease Control and Prevention (CDC), USA, coordinated a measles diagnostic workshop in Atlanta. The purpose of this workshop was twofold: to update representatives of the participating reference laboratories on the current status of procedures for laboratory confirmation of suspected measles cases, and to establish guidelines and procedures for the PAHO Measles Laboratory Network.

In September 1994, at the meeting of the Pan American Sanitary Conference, the Ministers of Health of the countries of the Americas unanimously adopted the goal of measles elimination in the Americas by the year 2000. The PAHO measles elimination strategy includes the following components:

- Achieving and maintaining high vaccination coverage in the population from 9 months to 14 years old,
- Careful surveillance for fever and rash illnesses, and
- Laboratory testing of sera collected from patients with fever and rash illnesses in whom a health care provider suspects measles infection.

Table 1
PAHO Measles Laboratory Network

Participating Reference Laboratory	Countries Supported
Laboratorio de Diagnóstico e Investigación, Argentina	Argentina Uruguay Paraguay
Fundação Oswaldo Cruz, Brazil Instituto Adolfo Lutz, Brazil	Brazil
To be determined	Canada
Instituto de Salud Pública, Chile	Chile Bolivia Peru
Instituto Nacional de Salud (INS), Colombia	Colombia Ecuador
Instituto Pedro Kouri (IPK), Cuba	Cuba Dominican Republic Haiti
Centro Conmemorativo Gorgas, Panama	Central America
Caribbean Epidemiology Center (CAREC), Trinidad	English-speaking Caribbean Belize Suriname
Instituto Nacional de Diagnóstico y Referencia Epidemiológica (INDRE)	Mexico
Centers for Disease Control and Prevention (CDC), Atlanta, Georgia	USA
Instituto Nacional de Higiene (INH), Venezuela	Venezuela

Recognizing the importance of laboratory confirmation of suspected measles cases, the Pan American Health Organization has begun establishing a region-wide measles laboratory network. PAHO has requested that the twelve national measles laboratories from member countries participate in the PAHO measles laboratory network (Table 1 and figure 1).

Update on Measles Diagnostics

The current "gold standard" for the serologic confirmation of measles diagnoses is the capture IgM immunoassay, using a recombinant measles virus nucleoprotein as antigen. Commercially available indirect IgM assays appear to perform satisfactorily for determining the presence or absence of IgM in most specimens, but are clearly less sensitive and specific than the CDC capture immunoassay.

In this issue:

Work is progressing towards the development of a rapid measles diagnostic test which can be used at the field level. It is hoped that a simple agglutination test can be developed using genetically engineered antigens containing measles virus epitopes.

Measles virus can be isolated from urinary tract cells and throat and nasal passage cells. The Marmoset lymphocyte continuous line B95A has been used with success for measles virus isolation.

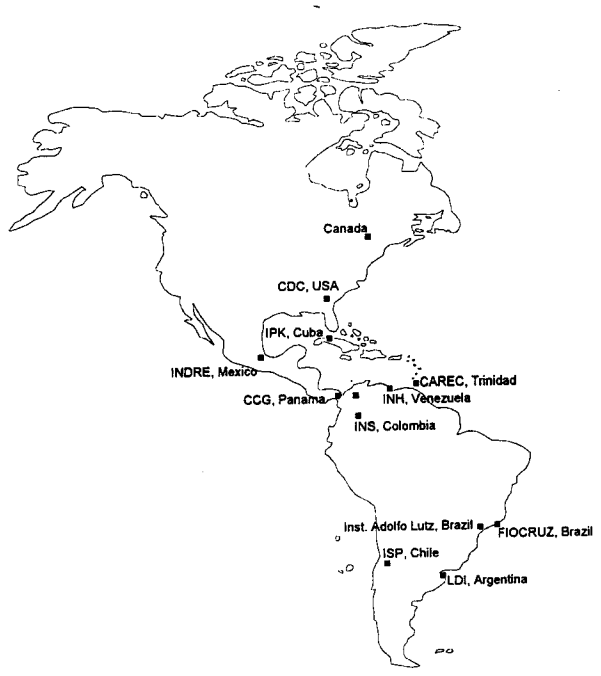
Polymerase chain reaction (PCR) has been shown to be effective in detecting measles RNA and this technique can be used as a complement to serologic tests to confirm measles diagnoses.

The CDC has developed expertise in performing genotypic analysis of measles virus isolates obtained from various outbreaks. These analyses have proven useful in determining likely geographic sources of measles virus.

Conclusions

The development of a region-wide measles laboratory network will greatly help in monitoring progress made towards measles elimination. With assistance from the laboratory network and clinicians, public health workers will be able confirm or exclude measles circulation within a community in a timely manner.

Figure 1
PAHO Measles Laboratory Network



A functional structure of the measles laboratory network was proposed (Table 1). The participating reference laboratories will assist and support neighboring countries in establishing national measles laboratories.

Each national laboratory will be expected to test serum specimens for anti-measles IgM using a commercial kit via the indirect method. The national laboratories will send all positive and indeterminate serum samples to the reference laboratories for confirmation. In addition, a random sample of 5-10% of negative specimens should be sent as well.

The CDC will send out panels of 10-15 sera for proficiency testing to participating reference laboratory approximately every 6 months.

Ongoing communication between participating reference laboratories is very important. The preferred method of communication will be electronic mail. Therefore, efforts will be made to assure that all laboratories have Internet access.

With regards to surveillance issues, the following points were agreed upon:

- Serum specimens should be collected only from patients meeting the clinical case definition for measles or from any patient in whom there is a clinical suspicion of measles infection.
- A **single** serum specimen collected 3 to 28 days following rash onset is considered acceptable and sufficient for IgM testing via capture method. The serum specimen should generally be obtained when the patient presents to a health facility. If a serum specimen is collected earlier than 3 days following rash onset, a second specimen should be collected 10-20 days following the acute specimen.
- During an outbreak, efforts should be made to obtain urine and/or nasopharyngeal aspirate specimens for viral isolation from several patients with measles. The optimal time for collecting urine specimens is within 7 days of rash onset. Urine specimens should be spun down and frozen. If the case is serologically confirmed as measles, the urine sample should be sent to the appropriate participating reference laboratory for viral isolation.
- Each specimen presented for testing to a participating laboratory must contain the following minimal information:

  Name of institution/provider sending specimen
  Patient ID
  Patient name
  City, County (municipality)
  Age
  Sex
  Meets "probable" case definition?
  Number of doses of measles vaccine received
  Date last measles vaccination
  Date of rash onset
  Date of collection

If this information is not provided, the laboratory may reject the specimen.

Polio Surveillance: Four Years Since Last Case!

The Region of the Americas is now marking the fourth year since the last recorded case of paralytic polio caused by wild poliovirus which occurred on 23 August 1991 in Junin, Peru. Wild poliovirus surveillance is critical in maintaining the Region polio free.

With the goal of global polio eradication nearing, the need for accurate and detailed surveillance of all cases of AFP is indispensable. The prompt detection of possible importations will allow appropriate control measures to be instituted and avoid a possible resurgence of transmission of wild poliovirus in the Region. High risk groups (i.e. groups with low coverage and/or groups which refuse vaccination) should be identified and continually monitored.

The graph at right shows that only eight countries in the Region are in compliance with all four indicators for AFP surveillance. Of particular concern is the number of countries not meeting the third indicator—collection of two adequate stool samples. Those countries which do not meet all four criteria should examine the barriers they face with regards to AFP surveillance and determine how to overcome them.

Indicators for Evaluating Poliomyelitis Surveillance in Latin America, 1995*

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

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

N.R. No Report Received
- Countries reporting zero cases
* Data as of 15 Aug.
Source: EPI/PAHO (PESS)

Meet criteria

Lack of Evidence for Wild Poliovirus Circulation United States, 1993

Following the isolation of wild poliovirus type 3 during January-February 1993 among members of a religious community objecting to vaccination in Alberta, Canada, surveillance for poliomyelitis was enhanced among related communities in the United States. In addition, during May-July 1993, a series of surveys was conducted in seven states (Iowa, Missouri, New York, Ohio, Pennsylvania, Washington, and Wisconsin) to determine whether wild poliovirus was circulating or had circulated recently among members of these religious communities residing in the states. This report summarizes the results of these surveys.

The isolation of wild poliovirus in Canada and the efforts to enhance surveillance in the United States followed a polio outbreak in the Netherlands during September 1992-February 1993. The outbreak was attributed to wild poliovirus type 3 and resulted in 71 cases of polio among members of a religious community objecting to vaccination. A virtually identical genotype of wild poliovirus type 3 was subsequently isolated from stool samples collected from members of related religious groups in Alberta during January-February 1993 and again from samples collected in April 1993; however, this genotype was not isolated from samples collected in June 1993 (P.Duclos, Laboratory Center for Disease Control, Ottawa, Canada, personal communication, November 1994). Based on nucleotide sequence studies, the poliovirus detected in the Netherlands and Canada most likely originated in India.

In response to the importation of poliovirus type 3 into the Western Hemisphere, measures taken by state health departments in the United States during April 1993 included 1) intensified efforts to vaccinate persons in religious communities that usually object to vaccination; 2) enhanced surveillance to identify medical conditions possibly caused by poliovirus (i.e., aseptic meningitis and acute paralysis); and 3) the initiation of a series of serologic, stool, and/or environmental surveys in Iowa, Missouri, New York, Ohio, Pennsylvania, Washington, and Wisconsin. The purpose of these surveys was to determine whether poliovirus type 3 was circulating currently or had circulated at any time since 1980 among unvaccinated members of these religious communities.

No cases of aseptic meningitis or acute paralysis have been detected among members of the religious communities since April 1993. Members of these religious communities were enrolled for the serologic, stool, and environmental surveys; members of 73 families in five states (Iowa, Missouri, Ohio, Pennsylvania, and Washington). A total of 123 serum specimens from persons in four states (Missouri, Ohio, Pennsylvania, and Washington) were tested for neutralizing poliovirus antibody; antibody to poliovirus types 1, 2, or 3 were detected in 40%, 92%, and 26% for specimens, respectively. However, poliovirus type 3 was not detected in any of the 40 children from Ohio and Pennsylvania who were unvaccinated and born after 1979. Based on the

serologic surveys, poliovirus type 3 had not circulated in these communities since 1980.

A total of 12 sewage and latrine waste specimens was collected during June and July 1993 from Iowa, Missouri, New York, Pennsylvania, and Wisconsin and was examined by polymerase chain reaction; wild poliovirus was not detected in these samples.

Editorial note: Wild poliovirus infection has not been documented among persons in the United States since 1986, when wild poliovirus type 1 was isolated from a person with imported paralytic polio. The last indigenous cases of polio in the United States occurred in 1979, and the last imported case in which wild poliovirus was not isolated was reported in 1993*.

Polio can be prevented by vaccination. All children and all previously unvaccinated adults should receive a primary series of at least three doses of oral poliovirus vaccine (OPV) or inactivated poliovirus vaccine. For children, the standard recommended 4 dose series of OPV comprises doses at ages 2,4, and 6 months and 4-6 years.

The findings in this report suggest that poliovirus type 3, which caused both the outbreak in the Netherlands during 1992-93 and the "silent" transmission in Canada during 1993, was not imported into the United States. Despite these findings, members of religious groups that object to vaccination and subopitmally vaccinated preschool-aged children who reside in urban areas may be susceptible to polio. If poliovirus is introduced into these unvaccinated groups, the number of persons who are susceptible may support virus circulation. Some members of groups usually opposed to vaccination will accept vaccination if offered.

On September 29, 1994, the International Commission for the Certification of Polio Eradication concluded that wild poliovirus transmission had been interrupted in the Western Hemisphere. However, the commission recognized that the region will remain at risk for poliovirus importation until polio is eradicated globally. The importations into the Netherlands and Canada underscore the efficiency by which poliovirus can be transported across borders and continents. Unvaccinated persons in groups objecting to vaccination is the primary group in the United States in which transient circulation of imported poliovirus may occur. To ensure that poliovirus transmission cannot be sustained in the United States, poliovirus vaccination coverage should be increased to 90% in all areas.

* This imported case occurred in a 2-year-old child who had onset of paralysis on December 15, 1993, in Nigeria and was brought for tertiary hospital care to New York 2 weeks later; no poliovirus was isolated from this child.

Source: MMWR 1995, 43:51 & 52, 957-8

Safety of Injections: Recommended Policy

An injection should only be given **if it is necessary—and each injection that is given must be safe.**

- An immunization injection is safe when the vaccine is injected with the appropriate equipment and according to the recommended procedures for injection, sterilization and disposal.

The proper techniques for immunization injections have been specified in a previous document (EPI/PHW/84.3 Rev.1). The scope of this document is, therefore limited to the selection of injection equipment and the procedures which are critical[1] for the safe us of the equipment.

1. Selection of injection equipment

1.1 Types of equipment

The following equipment can be used to safely administer injectable vaccines:

- Reusable syringes and needles
- Disposable syringes and needle
  - —Standard single-use type syringes and needles
  - —Auto-destruct type syringes and needles
- Needle-less jet injectors

The various types of equipment can be used singly or in combination, according to the requirements of different immunization strategies. Each type of equipment is safe only if users follow the critical sterile procedures which are specified for its use. (See sections 2-4 below.)

1.2 Reusable syringes

Reusable syringes should be used in small routine immunization sessions[2] where compliance with sterilization procedures can be assured, as verified by supervisory visits. Reusable syringes are usually not, however, practical nor economic for large routine immunization sessions[3] and should not be used in National Immunization Days (NIDs).

1.3 Disposable syringes

The "auto-destruct" syringe[4] is the preferred type of disposable equipment for administering injectable vaccines. Standard disposable equipment can continue to be used only in settings where it is guaranteed that the syringes and needles are destroyed after a single use. Disposable equipment can be used in both routine immunization sessions and large scale immunization activities, such as National Immunization Days (NIDs).

1.4 Jet injectors

High volume jet injectors may be used when injectable vaccines are given through large scale immunization activities, such as National Immunization Days (NIDs).

1.5 Disposal containers

Sufficient puncture-proof containers[5] for disposing of contaminated syringes, needles and other injection materials should be made available at all immunization sessions.

2. Critical sterilization and disposal procedures

2.1 Reusable syringes and needles

A sterilized syringe and a sterilized needle should be used for each injection. The critical procedures for handling, cleaning, sterilizing and disposing of reusable syringes and needles are outlined below.

2.1.1 Immediately after injection, flush water through the syringe and needle. Take the syringe apart and drop it and the needle into a bowl of water. After the immunization session, wash all the disassembled syringes in clean water before loading them for sterilization. Use forceps, not fingers, to pick the syringe and needle components from the water and place them in the sterilizer.

2.1.2 Dispose of syringes which leak, become too stiff to use or have faded graduations. The recommended method of disposal is by burning (destructive incineration). Where this is not possible, sterilize the contaminated equipment and dispose of it by burying it deeply in the ground (at least 0.5m below the surface).

2.1.3 Do not re-use needles which have become blocked, blunted or hooked. Do not attempt to re-sharpen needles. Destroy blunted, blocked or hooked needles by incineration. If this is not possible, sterilize and bury them deeply in the ground (at least 0.5m below the surface).

2.1.4 Include approved sterilization indicators (Time, Steam and Temperature: *TST indicators*) in each sterilization load. Inspect the indicator at the time of use and attach it to the immunization report.

2.1.5 Steam sterilize reusable needle, syringes and forceps at 121°C-126°C for 20 minutes, according to the instructions of the sterilizer manufacturer. Steam sterilization kills all harmful viruses, bacteria, and spores[6], including those that cause abscesses, tetanus, hepatitis B, and HIV.

2.2 Disposable syringes and needles

A sterile packed syringe and a sterile packed needle should be used for each injection and effectively destroyed according to the following critical procedures:

2.2.1 Immediately after a single use, place each syringe and needle in a puncture-proof container[7]. **Do not attempt to recap the needle.** Dispose of the contaminated equipment by burning (destructive incineration). Where burning is not possible, sterilize the contaminated equipment and dispose of it by burying it deeply in the ground (at least 0.5m below the surface).

2.2.2 Do not use disposable syringes and needles from damaged or punctured sterile packs, or which have passed the manufacturer's expiry date. Dispose of them by burning (destructive incineration). Where burning is not possible, sterilize the contaminated equipment and dispose of it by burying it deeply in the ground (at least 0.5m below the surface).

2.3 Jet injectors

The following critical procedures should be followed:

2.3.1 Steam sterilize reusable jet injector heads at 121°C-126°C for 20 minutes before each immunization session, according to the manufacturer's instructions.

2.3.2 Between each injection, clean injector heads with a swab that is kept damp with acetone or alcohol. Change the swab frequently. If the head becomes contaminated with blood or dirt, remove it from the injector and replace it with a sterilized head.

2.3.3 Clean the fluid path by flushing the jet injector with distilled water each time the vaccine type is changed and at the end of each session.

2.3.4 Perform periodic maintenance of jet injectors according to the manufacturer's recommendation to prevent deterioration in performance and avoid breakdowns.

3. Supervision and evaluation

Systematic supervision and periodic evaluation of injection practices are vital to ensure safety.

3.1 Supervisory visits

At least twice each year, make supervisory visits to each health center, using a checklist which includes a review of injection safety to improve performance (See Critical questions for supervisory checklist).

3.2 Assessment of injection practices

Include an assessment of safe injection practices, injection equipment and the equipment supply system in every EPI program review and other evaluation activities.

3.3 Routine monitoring

Routinely monitor and investigate all injection-related adverse events to improve injection performance and assist supervisory procedures.

4. Budgeting and supply

An uninterrupted supply of sufficient injection equipment is critical to the safety of immunizations. The measures which should be taken to assure the availability of adequate supplies include the following:

4.1 Disposable injection equipment

At central and intermediate stores, keep a reserve stock of equipment—at least 10% of the quantity used in each supply period. At peripheral stores keep a reserve stock that is sufficient for at least one month of immunization activities.

4.2 Reusable injection equipment

Keep a minimum level of syringes and needles in stock. (A minimum level is equal to the largest number of injections given at a single session, plus an additional 10% reserve.)

4.3 Jet injectors

Make available a minimum of three spare injector heads for each immunization session. In the event of very large numbers (greater than 300 injections), additional heads will be required.

4.4 Disposal Containers

Provide safe, puncture proof containers[8] in sufficient quantities to all health units for the collection an incineration of contaminated syringes. Provide sufficient fuel for sterilization to all health units.

4.5 Distribution system

For all injection equipment, establish a distribution system which is the same as that for vaccines, with the following characteristics:

- a timetable of regular supply dates
- an estimate of routine needs based on rates of use,
- planning of needs for special immunization activities, and
- a record of current stock levels.

4.6 Advance budget

One year in advance, establish an adequate budget for sufficient injection, sterilization and disposal equipment to cover routine immunization, special immunization activities and, if necessary, the restoration of reserve stocks.

Critical questions for supervisory checklist to determine injection safety

Check the following points and circle "YES" or "NO".

1. Have abscesses ocurred at the site of immunization injections? YES NO
2. Is there evidence of re-use of syringes and needles without sterilization? YES NO

If the answer to any of the above questions (1 or 2) is "YES", injections at this center are unsafe.

3. Is the stock of syringes, needles and fuel for sterilization sufficient for at least one week of immunization activities? YES NO
4. Is there evidence that contaminated injection materials are destroyed either by burning or by sterilization and deep burial (0.5m)? YES NO
5. Is there a steam sterilizer and heater available and in good working order? YES NO

If the answer to any of the above questions (3 or 4 or 5) is "NO", there is a risk of unsafe injections.

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1. "Critical" in this case refers to the most important of many sterile procedures which are already recommended in WHO EPI training documents.
2. Sessions where less than 120 injections are administered
3. Sessions Where over 120 injections are administered.
4. Designed according to WHO/EPI Standard equipment Specification E8/DS.1.
5. Designed according to WHO/EPI Standard Equipment Specification E10/IC.1
6. Boiling and other methods of high level disinfection will not destroy certain spores.
7. Constructed according to WHO/EPI Standard Equipment Specification E10/IC.1.
8. Constructed according to WHO/EPI Standard Equipment Specification E10/IC.1.

Source: WHO/EPI/LHIS/94.1

Acellular Pertussis Vaccine

The National Institute of Allergy and Infectious Diseases (NIAID) of the National Institutes of Health (NIH) of the U.S.A. has reported the findings of tests conducted in Sweden and Italy on three acellular pertussis vaccines. The three vaccines have shown to be highly effective in protecting infants against pertussis, and cause fewer side effects than the vaccines currently in use.

Pertussis is an extremely contagious respiratory tract infection which often begins with runny nose, sneezing, mild fever, and dry cough. Within two weeks the patient has periods of short, rapid coughs followed by a deep breath, or "whoop". This can last up to two months, and be accompanied by vomiting, choking, inability to breathe, and lack of oxygen to the brain can lead to injury. Worldwide, more than 50 million people are afflicted with this disease, causing 350,000 deaths each year.

Whole-cell pertussis vaccines are composed of killed *Bordetella pertussis* bacteria. Acellular pertussis vaccines consist of purified components extracted from the organism. All of the acellular vaccines in the two trials contained an inactivated form of pertussis toxin (PT), either native or recombinant. Scientists believe that during natural infection with *B. pertussis*, PT and other bacterial products participate in damaging and killing the cells that line the human respiratory tract. The three acellular vaccines tested had efficacy ratings from 84 to 85 percent for protection against pertussis. In the studies performed in Italy and Sweden, the whole-cell vaccine did not protect as well as the acellular, with efficacy ratings of 36 percent and 48 percent (the whole-cell vaccine has shown efficacy rates of up to 90 percent in some U.S. studies). The acellular vaccines in both trials were significantly less reactogenic than the DTP vaccine.

The introduction of the whole cell pertussis vaccine in the early 1940s lead to a decline of incidence of over 95%, and the number of pertussis-related deaths diminished from an estimated 12,000 annually to 11 in 1993. Difficulties in diagnosing pertussis still exist, however, leading the CDC to estimate that reported cases may only represent 10% of the actual number of cases.

Anthony S. Fauci, M.D., director of NIAID, in comments about the trial results said, "These results mark important progress toward the eventual NIAID goal of developing acellular combination vaccines that can protect children against numerous diseases with a minimum of vaccine shots and a minimum of side effects." Dr. Fauci also stressed that until the new vaccines are available, "the Public health Service recommends that parents continue to have their infants immunized against pertussis with the current vaccine, which for many years has safely and effectively controlled this disease in the United States."

Source: Office of Communications, NIAID, 13 July 1995

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.

Subregion and country	Date of last Report	Measles				Poliomyelitis		Tetanus				Diphtheria		Whooping Cough	
		Reported		Confirmed				Non Neonatal		Neonatal					
		1995	1994	1995	1994	1995	1994	1995	1994	1995	1994	1995	1994	1995	1994
LATIN AMERICA															
Bolivia	22 Jul.	23	577	0	577	0	0	...	...	11	...	4	...	30	...
Colombia	15 Jul.	2 358	538	148	68	0	0	...	...	...	...	...	...	...	...
Ecuador	08 Jul.	679	830	...	380	0	0	...	..	28	13	124	165	133	148
Peru	22 Jul.	145	272	...	272	0	0	27	13	25	10	1	1	340	118
Venezuela	08 Jul.	398	10 812	28	10 812	0	0	...	...	8	3	0	0	128	346
Southern Cone															
Argentina	01 Apr.	57	88	8	88	0	0	16	6	5	9	3	3	702	439
Chile	22 Jul.	152	83	0	0	0	0	...	1	...	0	...	0	...	20
Paraguay	22 Jul.	31	52	3	52	0	0	...	19	...	8	...	1	...	26
Uruguay	07 Jan.	...	...	...	...	0	0	...	2	...	0	...	0	...	3
Brazil	22 Jul.	1 209	428	1	428	0	0	...	180	...	28	...	47	...	431
Central America															
Belize	22 Jul.	6	27	0	0	0	0	...	...	...	...	...	...	...	...
Costa Rica	22 Jul.	249	171	18	0	0	0	...	...	...	...	...	...	...	...
El Salvador	22 Jul.	200	7 913	0	0	0	0	3	...	3	...	0	...	4	...
Guatemala	08 Jul.	35	227	25	204	0	0	...	...	...	6	...	...	...	33
Honduras	22 Jul.	17	15	1	1	0	0	7	8	2	5	0	0	0	2
Nicaragua	22 Jul.	119	638	7	1	0	0	2	...	2	...	0	...	3	...
Panama	22 Jul.	73	21	3	2	0	0	0	1	0	2	0	0	3	48
Mexico	22 Jul.	629	758	17	103	0	0	0	64	0	39	0	0	0	115
Latin Caribbean															
Cuba	22 Jul.	42	0	0	0	0	0	...	2	...	0	...	0	...	0
Haiti	07 Jan.	...	...	...	...	0	0	...	...	...	...	...	...	...	...
Dominican Republic	22 Jul.	30	296	0	296	0	0	...	...	...	4	...	1	...	8
CARIBBEAN															
Antigua & Barbuda	22 Jul.	1	2	0	0	0	0	0	0	0	0	0	0	0	0
Bahamas	22 Jul.	5	6	0	0	0	0	0	0	0	0	0	0	0	0
Barbados	22 Jul.	11	28	0	0	0	0	0	0	0	0	0	0	0	0
Dominica	22 Jul.	20	5	0	0	0	0	...	...	...	...	...	...	...	...
Grenada	22 Jul.	3	16	0	0	0	0	...	...	...	...	...	...	...	...
Guyana	22 Jul.	15	5	0	0	0	0	...	...	...	...	...	...	...	...
Jamaica	22 Jul.	116	49	0	0	0	0	...	...	...	...	...	...	...	...
St. Kitts/Nevis	22 Jul.	1	3	0	0	0	0	...	...	...	...	...	...	...	...
St. Vincent	22 Jul.	0	2	0	0	0	0	...	...	...	...	...	...	...	...
Saint Lucia	22 Jul.	7	16	0	0	0	0	...	...	...	...	...	...	...	...
Suriname	22 Jul.	5	11	0	0	0	0	...	...	...	...	...	...	...	...
Trinidad & Tobago	22 Jul.	36	16	0	0	0	0	0	0	0	0	0	0	0	1
NORTH AMERICA															
Canada	22 Jul.	1708	185	1 708	185	0	0	...	1	...	...	1	0	459	1 878
United States	22 Jul.	215	701	215	701	0	0	4	21	...	...	0	0	625	1 703

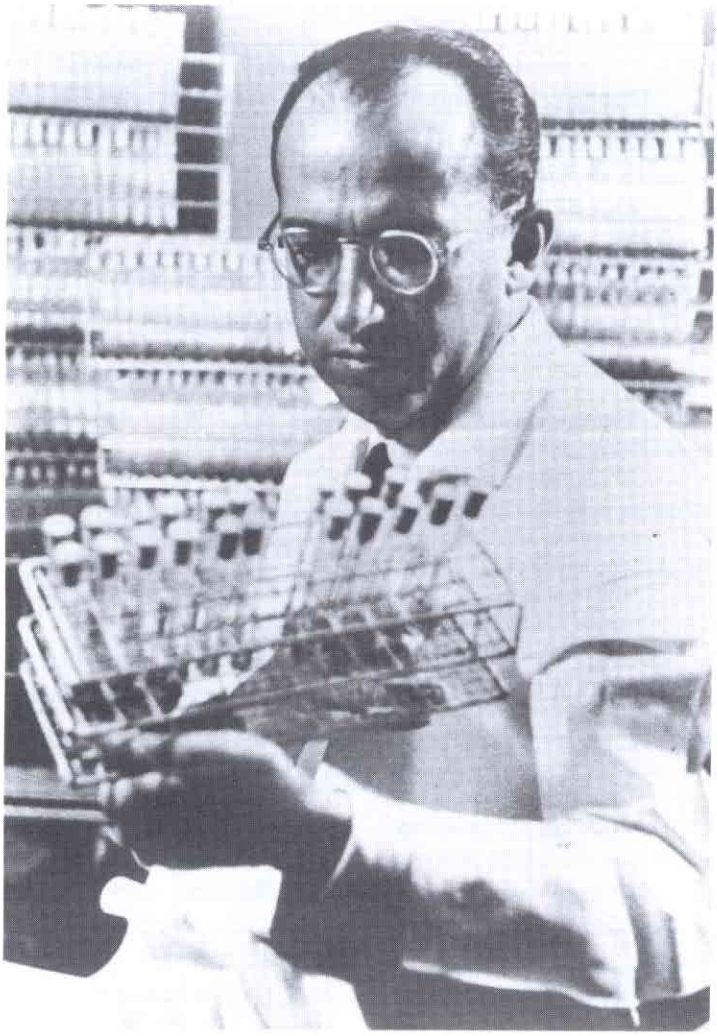
... Data not available.

Dr. Jonas Salk: In Memoriam

Dr. Jonas Salk, who developed the first polio vaccine, died on 23 June 1995, at age 80. Dr. Salk was born in New York City and studied at City College of New York and the New York University Medical School. Upon completion of medical school in 1942, Dr. Salk moved to the University of Michigan to develop influenza vaccines.

Dr. Salk began his research for a polio vaccine in the late 1940s, after his appointment to the University of Pittsburgh. In 1952, he began the clinical testing for a vaccine made from the killed poliovirus. By 1955, over one million school children were involved in field tests, making this the largest clinical experiment in medical history. The vaccine was proven safe and effective.

In the first year since the introduction of the vaccine, over 10 million children were vaccinated. Within six years, there was a 95% reduction of incidence of polio in the United States, from its peak of over 57,000 in 1952 to 910 in 1962. Millions of Americans, showed their gratitude to Dr. Salk by naming scholarships in his honor, and many cities named streets after him. President Dwight D. Eisenhower invited Dr. Salk to the White House to receive a thank-you on behalf of the American parents and children who benefited from the vaccine.



Doctor Jonas Salk in his laboratory, 1955

Jonas Salk often worked up to 18 hours a day, six to seven days a week, proving his determination and dedication to vaccine research. He also had an ability to integrate the innovations made by other scientists in the field into his own research. In 1963, Dr. Salk left the University of Pittsburgh and founded the Salk Institute for Biological Studies in La Jolla, California which was devoted to research on preventing birth defects and development of drugs to fight such diseases as multiple sclerosis. At the time of his death, Dr. Salk was at work on an AIDS vaccine.

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.

Special Program for Vaccines and Immunization
Pan American Health Organization
525 Twenty-third Street, N.W.
Washington, D.C. 20037
U.S.A.

Editor: Ciro de Quadros
Assistant Editor: Peter Carrasco

ISSN 0251-4729