EPI Newsletter

Expanded Program on Immunization in the Americas

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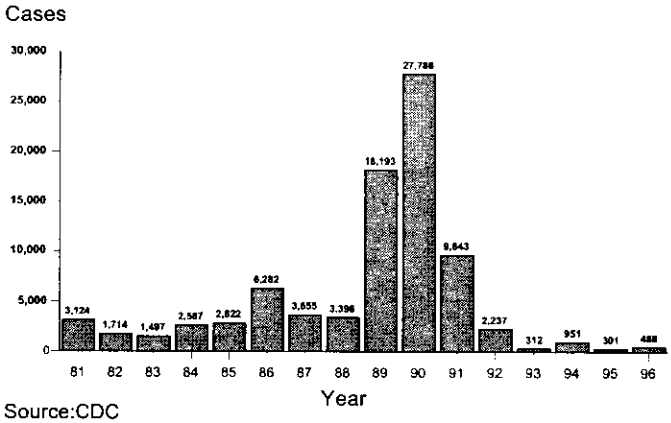
Measles in the United States, 1996

As of December 30, 1996, local and state health departments had reported a provisional total of 488 confirmed cases of measles to the Centers for Disease Control and Prevention (CDC) for 1996, and the Commonwealth of Puerto Rico had reported eight cases (Figure 1). In addition, indigenous transmission of measles in the United States was interrupted for a prolonged period beginning in late 1996. This report summarizes measles surveillance data for 1996, which indicate that a substantial proportion of cases were associated with continued international importations of measles and outbreaks among school-aged children who were not required to receive a second dose of measles-containing vaccine (MCV) to attend school.

Of the 488 provisional cases, 355 (73%) were indigenous to the United States. International importations accounted for 47 (10%) cases of measles, and an additional 86 (18%) cases were epidemiologically linked to imported cases.

Figure 1
Measles in the United States
1981-1996*



Source:CDC
*Provisional data for 1996

Importations originated from or occurred among persons who had traveled in Germany (seven cases); Greece and Japan (five each); Austria, India, and Philippines (three each); China, Italy, and Russia (two each); and England, Kenya, Liberia, Nepal, Somalia, Tahiti, and Turkey (one each). For eight of the imported cases, the exact source was unknown, because the patient had traveled in more than one country outside the United States during the exposure period. None of the imported cases were acquired in countries in the Americas.

Age and Vaccination Status

Of the 465 measles patients for whom age was known, 117 (25%) were aged less than 5 years, including 37 (8%) aged less than 12 months and 25 (5%) aged 12-15 months. A total of 195 (42%) measles patients were aged 5-19 years, and 153 (33%) were aged greater than or equal to 20 years. Vaccination status was reported for 354 patients (Figure 2). Of the 226 (64% of the total cases) who were not vaccinated, 170 (75%) were eligible to be vaccinated (i.e., aged greater than 12 months and born after 1956). Vaccination status varied by age group; all 32 patients less than 1 year were unvaccinated, compared with 44 (71%) of 62 patients aged 1-4 years, 65 (48%) of 136 patients aged 5-19 years, and 85 (69%) of 124 patients aged greater than or equal to 20 years.

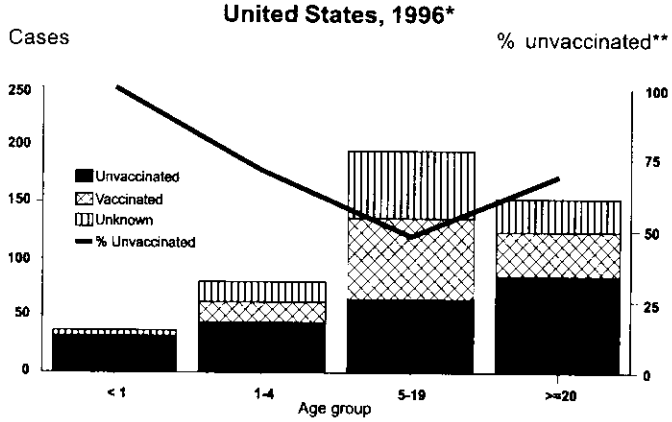
Outbreaks

Twenty-three outbreaks (i.e., clusters of three or more epidemiologically linked cases) were reported by 15 states, accounting for 76% of all cases. The number of cases associated with outbreaks ranged from three to 121 (median: five cases). Transmission of measles occurred in school settings in seven outbreaks, and these outbreaks accounted for 55% of all cases reported in 1996. In four outbreaks (Alaska, Texas, Utah, and Washington), cases among school-aged children occurred primarily in those who had received only one dose of MCV; in two other outbreaks (Massachusetts and Minnesota), cases occurred among school-aged children who had religious or philosophic exemptions to vaccination. In Hawaii, an outbreak occurred in a college without vaccination requirement.

In this issue:

The source case for six outbreaks (California, Hawaii, Massachusetts, New York, Pennsylvania, and Washington) was traced to an international importation. Genomic sequences from measles virus isolates from four outbreaks without an identified source case (Alaska, Massachusetts [different from the outbreak listed above in Massachusetts], Minnesota, and Utah) were similar to sequences from viruses that were identified as importations from Europe and Southeast Asia. This suggests than an additional 205 (42%) of the 488 provisional cases reported for 1996 were related to international importations.

Figure 2
Age distribution and vaccination status of reported measles cases
United States, 1996*



* excludes 23 cases with unknown age
**Percent unvaccinated among cases with known vaccination status

With the exception of an outbreak of measles in Hawaii (which was linked both by case investigation and molecular epidemiology to international importations of measles virus), indigenous transmission of measles in the United States appears to have been interrupted in late 1996. From October 18, 1996, to February 10, 1997 (16 weeks), only one case of measles (with rash onset on December 16) not linked to an international importation was reported in the United States. An indigenous case with rash onset in February is still under investigation.

Reported by: State and local health depts. Measles Virus Section, Respiratory and Enterovirus Br, Div of Viral and Rickettsial Diseases, National Center for Infectious Diseases; Child Vaccine Preventable Diseases Br, Epidemiology and Surveillance Div, National Immunization Program, CDC.

Source: MMWR 46(11); 242-246; March 21, 1997

Editorial Note: Similar to other countries in the Region, in 1996 the United States experienced a low level of measles virus circulation, and reported the third lowest total number of measles cases in the history of measles surveillance. Indeed, the 488 provisional cases reported in 1996 represent a 98% reduction compared to the nearly 28,000 cases reported in 1990 during the last major outbreak of measles in the United States. However, measles outbreaks continue to occur.

Of the total cases reported with known vaccination status in the United States during 1996, 64% occurred in unvaccinated individuals. Seventy-five percent of the unvaccinated cases were in the target age-group for measles vaccination, and of the cases occurring in preschool-aged children (1-4 years of age), 71% were unvaccinated. These data reinforce the fact that unvaccinated persons are always at highest risk for contracting measles. The high infectivity of measles allows the virus to seek out susceptible hosts, even in populations with high vaccination coverage.

Nearly 40% of total reported measles cases occurred among school-aged children (5-19 years of age). Of these, 52% were unvaccinated, many due to philosophical or religious objections to vaccination. The remaining cases among school-aged children were among vaccinated persons.

The occurrence of measles in persons with histories of measles vaccination is not unexpected. Measles vaccine effectiveness is less than 100%, meaning that 5-10% of persons do not become immunized to measles following vaccination. During a measles outbreak, susceptible, vaccinated persons may be exposed to the virus and develop measles. However, the risk of measles in a vaccinated person is clearly lower compared to that of the unvaccinated.

Analysis of data obtained from classic epidemiologic investigations, combined with information obtained from molecular epidemiology of isolated measles virus from reported measles cases suggest that importations may have been responsible for nearly 70% of the reported measles cases in the United States during 1996. The majority of imported cases appear to have originated from Europe and Asia.

None of the imported cases originated in the Region of the Americas. It has been over 2 years since the last measles case was imported from Latin America or the Caribbean into the United States. This provides further indirect confirmation of the remarkable progress the countries of the Americas are making towards achieving the goal of measles eradication by the year 2000.

To combat the occurrence of measles outbreaks among school-aged children in 1988, the United States adopted a routine two-dose measles vaccination schedule. During 1996, states which had not fully implemented this policy among all age cohorts of school-aged children were at greater risk for measles than those states which have assured that all school-aged children are vaccinated with two doses of measles-containing vaccine. The full implementation of this vaccination schedule is expected to greatly reduce the number of school-aged children with measles.

However, a two-dose measles policy is not an appropriate vaccination strategy for all countries. Unless nearly universal coverage can be obtained with the first dose of measles vaccine, the addition of a second dose will provide little benefit in preventing measles outbreaks. Indeed, most persons who receive a second dose of measles vaccine are already immune to measles, while the overwhelming majority of unvaccinated children are susceptible to measles and would be protected after receiving a single dose.

Update: Recent Measles Outbreaks in the Americas

Several outbreaks of measles have recently been reported in the Western Hemisphere—in Canada, Guadeloupe of the French West Indies and Brazil (Santa Catarina and São Paulo) during the past months. The *EPI Newsletter's* February 1997 issue provided extensive coverage of the Santa Catarina outbreak. The June *EPI Newsletter* will discuss the situation in São Paulo.

Guadeloupe: The French *département* of Guadeloupe, located in the Caribbean, investigated 135 cases of suspected measles between November 1996 to March 1997. Eighty-five of these cases were confirmed by the presence of anti-measles IgM antibodies or via epidemiological linkage. The first cases were reported from the city of Saint François, the main tourist area of the island. Until early 1997, most cases were confined to this region, but by 15 February, the epidemic had spread to adolescents attending Petit Bourg high school and several surrounding middle-schools. The group most affected was children 10-19 years of age. The source of the outbreak appears to be a young child visiting the island from Europe. Molecular analysis of measles virus isolated from the outbreak found that the virus circulating in Guadeloupe was very similar to recent isolates obtained from Western Europe.

Control measures were implemented, with measles vaccination offered to all secondary school children in areas affected by the outbreak. Investigation of the outbreak is continuing.

Canada: Between 16 January 1997 through 1 April 1997, a total of 298 confirmed measles cases have been reported in the Province of British Columbia. The measles cases are concentrated at the Simon Fraser University campus located near Vancouver. Most cases are occurring among students 20-29 years of age, many of whom had been previously vaccinated with one dose of measles vaccine. There have been no known cases among individuals immunized during last year's second dose *catch-up* measles campaign. The source of the outbreak is unknown, and molecular analysis of isolated measles virus is pending.

Enhanced surveillance, careful investigation of suspected measles cases and the administration of measles-rubella vaccine to persons thought to be susceptible are among the response activities being implemented. Persons born after 1956 without documentation of having received two-doses of measles vaccine are considered potentially susceptible to measles. Over 11,000 persons had been vaccinated in January, during the first week of the university-wide campaign. Attempts are being made to vaccinate all persons attending other post-secondary institutions in the Province, and to assure measles immunity among health care workers.

Sources: Dr. Max Théodore, DASD Conseil Général de la Guadeloupe, Dr. Régis Goursaud, Institut Pasteur de Guadeloupe and Dr. Paul Varughese, Division of Immunization, BID, LCDC, Canada.

Editorial note: These outbreaks provide further evidence on the changing epidemiology of measles in the Americas. In the pre-vaccine era, measles primarily affected infants and preschool-aged children. Large outbreaks would occur every 2-3 years, when the number of accumulated susceptible children was sufficient to sustain measles transmission.

As recommended by PAHO, most countries in the Region have conducted *catch-up* vaccination campaigns to assure high measles immunity among school-aged children. These vaccination activities have resulted in a substantial reduction in the circulation of measles virus in all countries of the Region, and a subsequent increase in the average age of infection. In the Americas, measles outbreaks now occur principally among older children, adolescents and young adults who have not been targeted for measles vaccination. These persons were often born too early for routine measles vaccination, yet too late to have been exposed to circulating measles virus. Many of these outbreaks can be traced to importations.

The high transmissibility of measles virus allows it to infect susceptible persons, even in areas with high measles population immunity. These recent outbreaks suggest that there may be many adolescents and young adults in the Region who remain susceptible to measles. Increased efforts are needed to assure measles immunity in these groups, especially those working or residing in high-risk environments, including secondary schools, colleges and health care settings.

Viral Hepatitis

This article is the second of three dealing with the subject of viral hepatitis. The previous issue of the ***EPI Newsletter*** *described general diagnostic aspects of viral hepatitis. this article details hepatitis B and D, and the following article will cover hepatitis A, C and E.*

Hepatitis B

Serology for the detection of Hepatitis B markers (Figs. 1 & 2) can be performed using enzyme immunoassays or agglutination tests, with the former more frequently employed. For positive HBsAg specimens, there are neutralization confirmation assays that use anti-HBs antibodies.

Serological Markers of Hepatitis B (Table 1)

1 **HBsAg:** is the HBV surface antigen, coded according to the S gene. HBsAg is the first marker to appear in the course of an HBV infection, preceding enzymatic changes and symptoms. In acute hepatitis, the antigen persists for 1 to 3 months after infection, and its presence for more than 6 months is indicative of chronic hepatitis.[1,4] After the incubation period, where it is the only marker, HBsAg has been found to be associated with the presence of anti-HBc in acute and chronic hepatitis.[1,2,3]

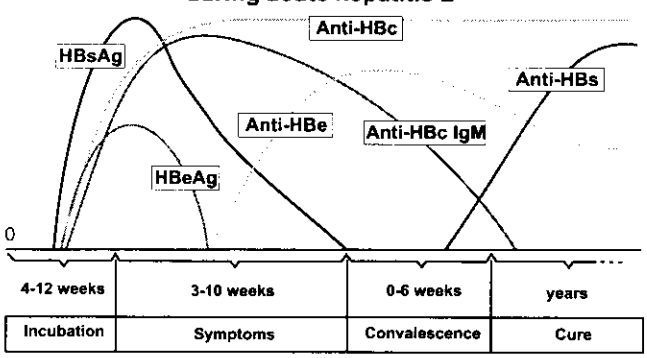
2 **Anti-HBs:** The neutralizing antibody and the only one that confers immunity to re-infection by HBV. It is an antibody of long duration and appears in serum usually 1 to 10 weeks after the disappearance of HBsAg. However, seroconversion is not always observed, since this marker can be transitory, lasting or may never exist. Anti-HBs is an indicator of cure and immunity.[1,2,3]

3 **HBcAg:** This product of the pre-C/C region of the viral genome is not detectable using serological tests, since is it not found free in serum.[3]

4 **Anti-HBc IgM:** A marker of recent infection, found in serum for a period of approximately 6 months after infection. This marker is extremely important because, at the end of the acute phase, when HBsAg is no longer detectable and seroconversion to anti-HBs has not yet occurred, Anti-HBc IgM is the only marker of acute infection present in the serum of infected individuals.[1,2,3] In chronic infection, it persists at very low titers as long as viral replication occurs and is thus rarely detectable by the test systems used.[2]

5 **Anti-HBc IgG:** A marker present in acute and chronic infections, it is an antibody of long duration.[1,2,3] Since it has no neutralizing capacity, this antibody does not confer immunity on the individual, and only suggests previous contact with the virus.[2]

Figure 1
Dynamics of the evolution of serological markers during acute hepatitis B



Pasteur[3]

6 **HBeAg:** A product of the splitting of the HBV nucleocapsid, released in great numbers in serum during viral replication for a period of approximately 3-6 weeks. This antigen is only found in the presence of HBsAg and represents the period of greatest infectivity. However, the most precise markers of viral replication are viral DNA and polymerase DNA. Their disappearance, followed by the disappearance of HBsAg is suggestive of evolution towards a cure. Their persistence for more than four months suggests a trend toward chronicity. It is important to stress that, in case of Delta Virus superinfection, this can lead to a decrease or even disappearance of HBeAg.[1,2,3]

7 **Anti-HBe:** Arises after the disappearance of HBeAg in both acute and chronic illness. In chronic and asymptomatic hepatitis, its presence suggests a decrease or absence of viral replication.[1,2,3] Reactivity of chronic infection can occur in individuals who lose HBV-DNA and seroconvert to anti-HBe. In these cases, the reappearance of HBeAg in serum will be observed.[2]

Anti-HBc as Sole Marker

The presence of anti-HBc as the only positive marker must be interpreted carefully, since it can occur due to different causes.[3-6]

- Lack of assay sensitivity, causing false-negative results for HBsAg or anti-HBs.
- False-positive result for anti-HBc.
- Immunological window period, where seroconversion to anti-HBs has not yet occurred and HBsAg is no longer detectable.
- Anti-HBc remains as the only marker after the loss of anti-HBs and anti-HBe.
- Suppression of HBsAg due to Delta virus infection.
- Antigenic variants of HBsAg, not detected by conventional tests.

Genetic Variability of HBV and Diagnosis

PreS/S region: HBV presents various subtypes, which result from mutations in a single base in the S gene. However, there is a common determinant, the *a* determinant, present in all the subtypes. Since anti-HBs is usually directed against this determinant, mutations which give rise to its loss will lead the antigen to escape detection by the anti-HBs, directly interfering in serological tests through the presence of false-positive results. Infections from these HBV mutations can only be detected by PCR.[7-10]

PreC/C Region: Mutations in the pre-core region have been associated with HBeAg inability to express. In these cases, despite the absence of HBeAg and seroconversion to anti-HBe, viremia still occurs in the individual (HBV-DNA positive), with no association between absence of HBeAg and decreased viral replication.[5,11,12]

Table 1
Interpreting the serological profile in HBV infection

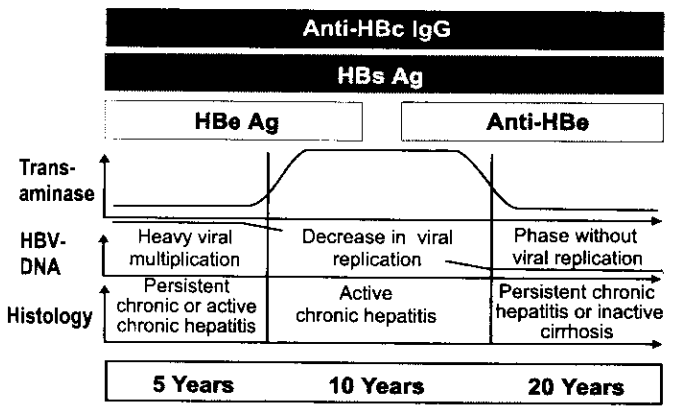
Interpretation of Serological Profile	HBsAg	HBeAg	Anti-HBc IgM	Anti-HBc IgG	Anti-HBe	Anti-HBs
Susceptible	-	-	-	-	-	-
Incubation	+	-	-	-	-	-
Acute phase	+	+	+	+	-	-
Acute final phase or chronic hepatitis	+	+	-	+	-	-
	+	-	-	+	+	-
	+	-	-	+	-	-
Beginning of convalescent phase or recent infection	-	-	+	+	-	-
Immunity, recent past infection	-	-	-	+	+	+
Immunity, past infection	-	-	-	+	-	+
Immunity, vaccine response	-	-	-	-	-	+

Hepatitis D (Delta)

Diagnosis of Hepatitis D is only indicated in those who are HBsAg positive. Anti-HD antibodies appear late in the course of the infection and this results in a window period of variable duration. In some cases, they may never be found. It is important to include test for detection of HBsAg and Anti-HBc IgM to allow for differential diagnosis between coinfection and superinfection by Delta Virus. In superin-

fection, the antibody titer increases significantly. This information is very useful for identifying chronic cases.[1,2] However, the best technique for diagnosing hepatitis D is based on the detection of tissue antigen through immunofluorescence or immunoperoxidase techniques.[2]

Figure 2
Dynamics of the evolution of serological markers in chronic hepatitis B



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Serological Markers of Hepatitis D (Table 2)

1 **HDAg:** There is some controversy regarding the usefulness of this marker in the detection of Hepatitis D. According to some authors, antigenemia permits diagnosis in serum specimens obtained during the first week of the illness. For other authors, HDAg is a marker inconsistently detected in serum, especially in the case of superinfection.[13]

2 **Anti-HD IgM:** Appear with the acute symptoms of the illness and, when available, are used both for diagnosis and for monitoring patients receiving interferon therapy, since they disappear when the illness is eliminated. They are the most stable markers and are detected before anti-HD IgG. There is a strong correlation between anti-HD IgM, the presence of HD RNA in serum and HDAg in the hepatocyte nuclei.[2,13]

3 **Anti-HD IgG:** A marker for past infection and immunity, appearing in serum at about 12 weeks.

Table 2
Interpreting the serological profile of hepatitis D

Interpretation	HBS Ag	Anti-HBc IgM	HD Ag	Anti-HD IgM	Anti-HD IgG
Coinfection or recent superinfection	+	-	+	-	-
Recent coinfection	+	+	-	+	-
Recent superinfection	+	-	+	+	-
	+	-	-	+	-
Old superinfection	+	-	-	-	+
Immunity	-	-	-	-	+

Source: Oliveira, M.L.A., Yoshida, C.F.T., Schatzmayr, H.G. "Diagnóstico Laboratorial das Hepatites Virais" Virology Department, Oswaldo Cruz Foundation, Rio de Janeiro, December 1995.

References

1 Vitral, C.L.; Oliveira, L.H.S. Oliveira, S.A. Hepatites Virais. Virus da Hepatite A, B, C, D e E. In: Oliveira, L.H.S. **Virologia Humana.** Editora Cultura Médica (1994), pp. 283-301

2 Dantas, U.; Dantas, E.B. Os virus da hepatite e seus marcadores: a ótica do clínico. In: Mendes, F.; Pitella, A.M. **Recentes Avanços em Hepatites**. Editora BYK (1993), pp. 11-18.

3 Pasteur Vaccines. **L'Hepatite B en question.** 1994 Edition.

4 Kroes, ACM et al **Journal of Medical Virology** (1991), 35:96-100.

5 Gerlich, WH; Caspari, G; Thomssen, R. A critical appraisal of anti-HBc, HBV DNA and anti-HCV in the diagnosis of viral hepatitis. **Biotest Bulletin** (1991), 4:283-293.

6 Fonseca, JCF. Diagnóstico Sorológico das Hepatites Virais. **Gastroenterologia** (1994) 1(1): 10-16.

7 Lee, HS; Ulrich, PP; Girish, WV Mutations in the S gene affecting the immunologic determinant of envelope proteins of Hepatitis B Virus. **J. Hepatol** (1991), 13(4):97-101.

8 Carman, WF, Vaccine-associated mutants of Hepatitis B Virus. **Viral Hepatitis and Liver Disease.** (1994):243-247.

9 Wallace, LA; Echevarría, JM; Carman, WF Monoclonal antibody reactivity associated with sequence changes in subtype defective variants of HBV in Spain. **J. Hepatology**. (1993), 18(1):S21.

10 Howard, CR; Karthigesu, VD; Allison, LMC et al. Hepatitis B Virus Variants with altered *a* determinants causing infections in immunized children. **Viral Hepatitis and Liver Disease.** (1994), 252-255.

11 Santantonio, T; Jung, MC; Miska, S et al. High prevalence of HBV pre C mutants in anti-Hbe positive carriers with chronic liver disease in South Italy. **J. Hepatol** (1991), 13(4):78-81.

12 Carman, WF; Thomas, HC. Genetically defined variants of Hepatitis B Virus. **Reviews in Medical Virology** (1991), 1:29-39.

13 Dubois, F.; Goudeau, A. Serological Diagnosis of Hepatitis B and Delta. **Laboratory Technical Reviews, 4.** Diagnostic Pasteur, p.28-36.

Argentina Introduces Hib and MMR Vaccines

In April 9, 1997, the Ministry of Health and Social Action of Argentina formally introduced the *Haemophilus influenzae* type b (Hib) vaccine and the combined live vaccine for measles, mumps and rubella (MMR) in the country's regular immunization program.

In the official text, the Ministry of Health mentions that Hib vaccine will prevent severe infections caused by this pathogen, such as meningitis and epiglottitis, which are highly lethal (5 to 8%), and can also leave sequelae like mental retardation and deafness (25 to 35%). The most affected group is between the ages of 2-28 months (35 to 40% of cases).

MMR vaccine is currently preventing three diseases (mumps, rubella and measles) which can cause death and leave physical sequelae, some of them severe. In the case of rubella it will also protect against congenital rubella syndrome (CRS).

Source: Ministry of Health and Social Action, Argentina.

Editorial Note: As announced in the *EPI Newsletter* in December of 1996 and the current issue (see page 8), Uruguay and Chile have already introduced Hib vaccine in their regular immunization schedule. Hib is also part of the regular vaccination schedule in the Cayman Islands and the Netherlands Antilles. Other countries considering Hib vaccine are: Colombia, Costa Rica, Dominican Republic, Mexico and Peru.

With the technical support of PAHO and led by the Ministry of Health, a commission was established in El Salvador to carry out surveillance for *H. influenzae*. In Nicaragua, a protocol was developed to expand the surveillance for *H. influenzae* in the majority of the country's hospitals.

Measles Vaccination and Guillain-Barré Syndrome

Background. Guillain-Barré syndrome (GBS) has been associated with several infectious agents, and the possibility that the disorder may be caused by vaccination has been raised. We compared the numbers of cases of GBS observed immediately after mass measles vaccination campaigns with the numbers that would be expected from baseline rates, to assess whether there is a causal relation between measles vaccination and GBS.

Methods. We analyzed data on 2,296 cases of GBS reported to the Poliomyelitis Eradication Surveillance System of the Pan American Health Organization as cases of suspected poliomyelitis. These cases occurred among 73 million immunized children aged 9 months to 15 years in Argentina, Brazil, Chile, and Colombia, between January, 1990, and December, 1994. These children were targeted for mass measles vaccination campaigns (each lasting 1 month) in 1992 and 1993. The frequency of GBS cases observed during the vaccination campaigns or the next 42 days (the latent period) was compared with that during the rest of the study period, with the assumption of a Poisson distribution.

Findings. The average annual incidence of GBS was 0.62 per 100,000 children aged 1-14 years. The number of cases that would be expected within any 72-day period would therefore be 92. The average observed number of cases during the latent periods after measles vaccination was 97. The probability that 97 or more cases would occur during a period with an expected number of 92 was 0.31.

Interpretation. The average annual rates of GBS by age-group for the 5 years analyzed were consistent with previous data; thus we are confident that the surveillance system is sufficiently sensitive. There was no statistically significant association between measles vaccination and GBS. If there is any causal relation, the number of GBS cases due to measles vaccination was so small that data from the vaccination of more than 70 million children were not sufficient to detect a rise in the number of observed GBS cases beyond the expected number.

Source: da Silveira, C.M., Salisbury, D.M., de Quadros, C.A. Measles Vaccination and Guillain-Barré Syndrome. *Lancet* 1997; *Vol* 349: 14-16.

Editorial Note: The majority of vaccinations are administered during a child's first years of life. Therefore, any illness afflicting that child will likely occur within a short period of time following his/her most recent vaccination. This fact needs to be taken into account when determining the presence or absence of a causal relation between vaccines and adverse events. This argument is supported by the 1994 review of adverse events associated with childhood vaccines published by the Institute of Medicine (IOM). The study sought to make causal inferences about the relation between vaccines administered and several adverse health outcomes. Most of the impairments classified as adverse events of vaccination were discarded for lack of data and biological plausibility.

Polio Surveillance

In 1996, important progress was made towards the global goal of polio eradication. Preliminary data show that 2,090 cases of polio were reported worldwide and global coverage with oral polio vaccine (OPV) held steady at 83%. The number of National Immunization Days (NIDs) held worldwide increased during the last year—Operation MECACAR (19 countries of the Middle East, the Caucasus and Central Asia Republics) reached 69 million children with OPV in 1996, and seven South Asian nations joined together to conduct two NIDs in December 1996 and January 1997, vaccinating 250 million children. In India alone, 117 million children were vaccinated in one day. The countries of Africa have joined in a campaign to "Kick Polio Out of Africa", and already 28 countries have conducted national or sub-national immunization days. Challenges remain before the goal of global eradication is reached, primarily regarding political and financial commitment. War and civil unrest have blocked efforts to reach all children needing immunization. Therefore, "Days of Tranquillity" are currently being negotiated in several parts of the world.

In the Region of the Americas, coverage with OPV was 87% (provisional data) and polio surveillance activities were adequate, with a total of 1,832 cases of AFP investigated last year. In 1997, 19 countries have scheduled at least one NID for the year. Importation of wild poliovirus is a serious threat, therefore it is important that coverage with OPV be kept high, in order to eliminate pockets of susceptible children, and that countries reverse the declining attention to the polio surveillance indicators (see table).

AFP Surveillance Indicators

Country	80% weekly reporting units	80% of cases investigated within 48 hours	80% of cases with 1 adequate stool sample taken	AFP rate ≥ 1:100,000 in children <15 years
Bolivia				
Colombia				
Cuba				
Chile				
Ecuador				
El Salvador				
Nicaragua				
Paraguay				
Venezuela				
Brazil				
Dominican Republic				
Guatemala				
Honduras				
Panama				
Peru				
Uruguay				
Argentina				
Mexico				
Costa Rica				
Haiti				

Meet criteria

* Data as of 22 March 1997

Source: SVI/PAHO (PESS)

Reported Cases of Selected Diseases

Number of reported cases of measles, poliomyelitis, tetanus, diphtheria, and whooping cough, from 1 January 1997 to date of last report, and the same epidemiological period in 1996, by country.

Country/Territory	Date of last report	Measles				Polio		Tetanus				Diphtheria		Whooping Cough	
		Confirmed 1997			Confirmed*			Non Neonatal		Neonatal					
		Laboratory	Clinically	Total	1996	1997	1996	1997	1996	1997	1996	1997	1996	1997	1996
Anguilla	22 Mar	0	0	0	0	0	0	...	...	...	...	...	...	...	...
Antigua & Barbuda	22 Mar	0	0	0	0	0	0	0	...	0	...	0	...	0	...
Argentina	22 Mar	0	1	1	20	0	0	...	7	...	0	...	0	...	29
Bahamas	22 Mar	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Barbados	22 Mar	0	0	0	0	0	0	0	..	0	0	0	...	0	...
Belize	22 Mar	0	0	0	0	0	0	0	...	0	...	0	...	0	...
Bermuda	22 Mar	0	0	0	0	0	0	0	...	0	...	0	...	0	...
Bolivia	22 Mar	0	0	0	0	0	0	...	...	...	0	...	1	...	1
Brazil	15 Mar	68	15	83	9	0	0	...	13	...	5	...	0	...	79
British Virgin Islands	22 Mar	0	0	0	0	0	0	0	...	0	...	0	...	0	...
Canada	22 Mar	303	--	303	49	0	0	...	1	...	...	...	...	...	1,112
Cayman Islands	22 Mar	0	0	0	0	0	0	0	...	0	...	0	...	0	...
Chile	22 Mar	0	0	0	0	0	0	1	4	0	0	0	0	117	245
Colombia	22 Feb	0	0	0	4	0	0	...	...	...	10	...	...	...	...
Costa Rica	15 Mar	0	0	0	0	0	0	1	...	0	...	...	...	4	...
Cuba	22 Mar	0	0	0	0	0	0	...	...	...	...	...	...	...	...
Dominica	22 Mar	0	0	0	0	0	0	0	...	0	...	0	...	0	...
Dominican Republic	22 Mar	0	0	0	0	0	0	1	...	0	0	0	1	0	0
Ecuador	22 Mar	0	0	0	17	0	0	...	...	...	8	...	1	...	15
El Salvador	22 Mar	0	0	0	0	0	0	0	...	1	...	0	...	0	...
French Guiana	22 Mar	0	0	0	...	0	0	...	...	...	...	...	...	...	...
Grenada	22 Mar	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Guadeloupe	22 Mar	72	0	72	0	0	0	...	...	...	...	...	...	...	...
Guatemala	22 Mar	0	0	0	0	0	0	...	...	...	...	...	...	...	...
Guyana	22 Mar	0	0	0	0	0	0	...	...	...	...	...	...	...	...
Haiti	1 Mar	0	0	0	...	0	0	...	...	...	...	...	...	...	...
Honduras	22 Mar	0	0	0	0	0	0	0	...	0	...	0	0	3	0
Jamaica	22 Mar	0	0	0	0	0	0	0	...	0	...	1	...	0	...
Martinique	22 Mar	0	0	0	...	0	0	...	...	...	...	...	...	...	...
Mexico	22 Mar	0	0	0	0	0	0	23	14	7	10	0	...	0	0
Montserrat	22 Mar	0	0	0	0	0	0	0	...	0	...	0	...	0	...
Netherlands Antilles	22 Mar	0	0	0	...	0	0	...	...	...	...	...	...	...	...
Nicaragua	22 Mar	0	0	0	0	0	0	1	0	0	0	0	0	14	3
Panama	22 Mar	0	0	0	0	0	0	0	...	0	...	0	0	4	0
Paraguay	8 Feb	0	0	0	4	0	0	...	...	...	...	...	...	...	...
Peru	22 Mar	0	0	0	0	0	0	12	15	5	17	0	2	182	105
Puerto Rico	22 Mar	0	--	0	0	0	0	...	...	...	...	...	...	...	...
St Vincent/Grenadines	22 Mar	0	0	0	0	0	0	0	...	0	...	0	...	0	...
St. Kitts/Nevis	22 Mar	0	0	0	0	0	0	0	...	0	...	0	...	0	...
St. Lucia	22 Mar	0	0	0	0	0	0	0	...	0	...	0	...	0	...
Suriname	22 Mar	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Trinidad & Tobago	22 Mar	0	0	0	0	0	0	0	...	0	0	0	0	0	0
Turks & Caicos	22 Mar	0	0	0	0	0	0	1	...	0	...	0	...	0	...
United States	22 Mar	11	--	11	43	0	0	...	...	...	...	...	...	...	481
Uruguay	15 Mar	0	0	0	0	0	0	...	0	...	0	...	0	...	6
Venezuela	22 Mar	0	0	0	2	0	0	...	...	...	2	...	0	...	81
Total		**454**	**16**	**470**	**148**	**0**	**0**	**40**	**54**	**13**	**52**	**1**	**5**	**324**	**2,157**

... Data not available.
—Clinically confirmed cases are not reported.
* Laboratory and clinically confirmed cases.

Haemophilus influenzae type b in Chile

Invasive infections caused by *Haemophilus influenzae* type b were measured in Chile through laboratory results of investigations carried out in the metropolitan region (area where 40% of the population is concentrated in the country). With these data, it was estimated that the incidence rate in the country was 39.5 per 100,000 children under 5 years of age. Eighty percent of cases corresponded to children under 18 months of age. The fatality rate was estimated as 16% and the meningeal sequelae were above 30%. There have been approximately 580 cases in Chile every year.

Chile incorporated Hib vaccination into its EPI immunization schedule in July of 1996, with doses applied at 2, 4 and 6 months of age. Systematization of surveillance at the national level had already begun in January of that year, with the training of all those responsible for the country's 26 health services.

Table 1
Hib cases by diagnosis
Chile, 1996

Diagnoses	Number	%
Meningitis	118	63.4
Pneumonia	20	10.8
Bacteriemia	22	11.8
Cellulitis	6	3.2
Arthritis	5	2.7
Epiglottitis	2	1.1
Other	12	6.5
Pending	1	0.5
TOTAL	**186**	**100**

As of December 1996, the surveillance results show a total of 186 cases reported. Table 1 shows the distribution by diagnosis, with 63.4 % meningitis, 11.8 % bacteriemia, 10.8 % pneumonia and 5.9 % each for arthritis and cellulitis.

According to age, the most affected group was that between the ages of 6-11 months, with 30.1% of cases, followed by children less than 6 months with 20.9%, and children aged 12-23 months with 19.4% of total cases. In conclusion, the most affected were children under the two year age range, with 70.4% of Hib cases (Table 2).

Table 2
Cases, affected groups and
Hib incidence rate by age
Chile, 1996

Age	No. of Cases	%	rate/100,000
< 6 months	39	20.9	26.7
6-11 months	56	30.1	38.3
12-23 months	36	19.4	12.3
2-4 years	26	14.0	3.0
5+ years	22	11.8	0.2
age unknown	7	3.8	-
TOTAL	**186**	**100**	**1.3**

Regarding the risk factor of the disease, the incidence rate for children under 5 years is 10.7 per 100,000, and 22.4 per 100,000 for children under 2 years of age.

It is necessary to take into account significant underreporting due the fact that it was the first year with national surveillance for the disease. Since vaccination began as recently as July 1996, a decrease in Hib cases in children less than 1 year of age should be observed during 1997 as more children become fully vaccinated with three doses of Hib vaccine.

Source: Ministry of Health, Chile.

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