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Honduras: Denominator Adjustment in Population Aged Under Five Years

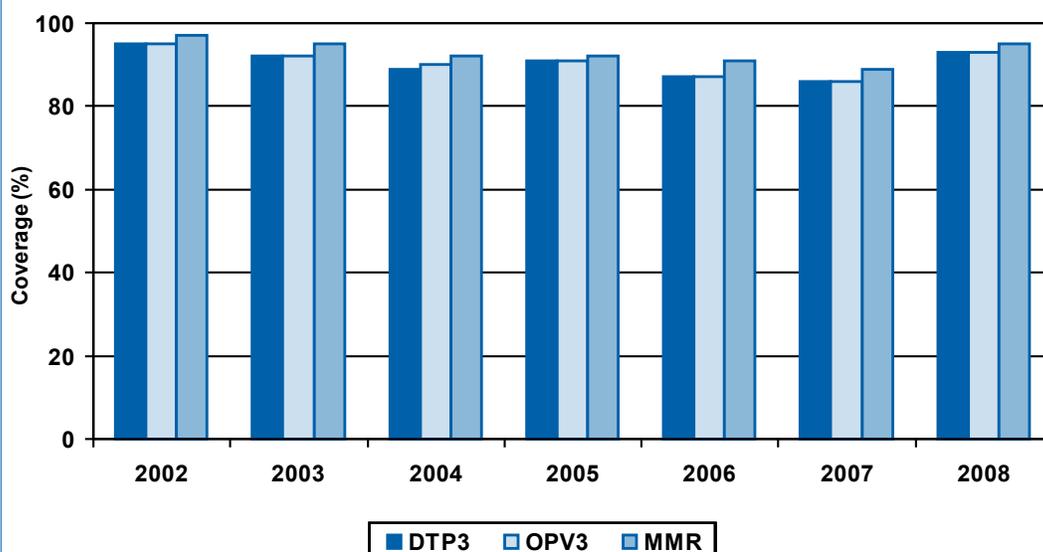
Background

The Ministry of Health of Honduras, through its Statistics Department, is the authority responsible for generating population estimates on an annual basis. The estimates are produced for the total population or by age group, and by health region, based on projections from population and housing census conducted by the National Institute for Statistics (*Instituto Nacional de Estadística/INE*).

The penultimate census in Honduras took place in 1988 and authorities made the estimates official in 1992. Figures showed a 6% underestimation of the population aged <1 year, based on data of administered doses for BCG and the first dose of polio Sabin. With help from the graduate program in Population and Development from the Universidad Nacional Autónoma de Honduras (UNAH), the Department of Planning, Coordination and Budget, and the United Nations Population Fund (UNFPA), the Ministry of Health later designed a methodology to correct the INE estimates. The resulting data were subsequently made official for use by the Ministry of Health.

Honduras conducted its last census in 2001 and authorities published the estimates in 2003. A revision by the Statistics Department of the Ministry of Health and by the Expanded Program on Immunization (EPI) showed a significant overestimation (16%) of two population groups: children aged <1 year and children aged 1-4 years. When presented with the information, INE initially proposed to use data from the household survey conducted every six months to revise the estimates for the two age groups. However, INE later notified the Ministry of Health that this revision would not take place. Therefore, the Ministry decided to continue using estimates based on the methodology used since 1995.

Figure 1. Reported Vaccination Coverage of DTP-Hib-HepB3, OPV3, and MMR Honduras, 2002-2008



Source: EPI Tables and PAHO-WHO/UNICEF Joint Reporting Forms (JRF), FCH/IM, PAHO.

Yellow Fever ESAVIs in Peru, 2007: Findings from an Expert Panel

Yellow fever vaccine-associated viscerotropic disease (YEL-AVD) is a rare but life-threatening complication. It was first described in the literature in 2001, yet the earliest confirmed occurrence of YEL-AVD dates back to 1975. Up to September 2007, a total of 36 YEL-AVD cases had been reported worldwide following administration of yellow fever vaccines (17D and 17DD substrains) from 5 manufacturers. The mean age was 49 years (range 4-79 years), the male:female ratio was 2:1, and the case-fatality rate was 60%. Reported risk factors include age >60 years and thymic disease/thymectomy.

Background

In September-October 2007, a mass immunization campaign, including yellow fever vaccine with the 17DD substrain, was conducted in the Ica Region of Peru, following a major earthquake. Approximately 63,000 yellow fever doses were administered. On 6 October, a first event supposedly attributable to vaccination or immunization (ESAVI) with yellow fever vaccine was notified to the surveillance system. The case was suspected to be a YEL-AVD. The patient died the same day and the regional authorities decided to stop the vaccination campaign. From 6 October to 4 November, four other suspect YEL-AVD cases were notified in the Ica Region. Overall, five persons aged 23 to 79 years and who had received yellow fever vaccine

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Since 2003, the EPI has been sending reports to the Statistics Department on vaccine coverage verification at local, municipal, and departmental levels in the majority of health regions. The reports showed that, even with adjusted population data from the Statistics Department, the overestimation of population groups aged <1 year and 1-4 years persisted. Similarly, vaccination coverage rates showed a declining trend until 2007 (Figure 1).

During the international EPI evaluation conducted by the Pan American Health Organization (PAHO) in August 2007, the issue of official denominator estimates was raised.¹ The following two recommendations were made to the Ministry of Health: (1) to form a national expert committee on population to analyze the denominators; and (2) to conduct a denominator study.

In 2008, following on the recommendations, the Ministry of Health formed a national committee with members from the Ministry of Health (Statistics Department and, as an observer, EPI), experts from UNFPA, UNICEF, the U.S. Agency for International Development, PAHO, INE and the Red Solidaria. A demographer from the PAHO Headquarters provided technical support to the discussion and analysis. The conclusion of the committee was that, given the results of the National Health and Population Survey conducted in years 2005-2006 and showing a decline in the fertility rate as compared to the 2001 population census, the figure for the population aged <1 year should be adjusted by INE. Consequently, INE requested that the demographer from the Latin American Center for Demography (*Centro Latinoamericano de Demografía/CELADE*) who had calculated the projections for the 2001 census come back to Honduras to further analyze the data and adjust them.

Results from the Population Adjustment

In August 2008, the INE provided the Ministry of Health with adjusted figures for population groups aged <1 year and 1-4 years by municipality during the period 2004-2015. An analysis of the official INE projections, based on the 2001 population census, compared to the figures adjusted by INE in 2008 showed an average discrepancy for the period 2004-2008 of 33,237 children aged <1 year and 61,412 children aged 1-4 years (Table 1).

An analysis of the population figures adjusted

Table 1. Estimates of Population Aged <1 Year and 1-4 Years: Discrepancies Between Official Data from the 2001 Census and 2008 Adjusted Population Figures, INE, Honduras, 2004-2008

Years	Population Aged <1 Year		Discrepancy	Population Aged 1-4 Years		Discrepancy
	Estimated*	Adjusted**		Estimated*	Adjusted**	
2004	213,186	187,087	26,099	827,020	809,522	17,498
2005	215,101	182,320	32,781	832,481	789,386	43,095
2006	216,464	182,067	34,397	838,017	762,634	75,383
2007	217,251	181,506	35,745	845,996	740,513	105,483
2008	217,842	180,677	37,165	852,468	726,276	126,192

* Projections from 2001 Population and Housing Census, INE.

** Adjusted projections for population aged <5 years, 2004-2015, INE.

Table 2. Estimates of Population Aged <1 Year and 1-4 Years: Discrepancy Between Official Data from the Ministry of Health and the Population Figures Adjusted by INE, Honduras, 2004-2008

Years	Population Aged <1 Year		Discrepancy	Population Aged 1-4 Years		Discrepancy
	Estimated*	Adjusted		Estimated*	Adjusted	
2004	195,826	187,087	8,739	757,750	809,522	-51,772
2005	197,159	182,320	14,839	770,870	789,386	-18,516
2006	197,208	182,067	15,141	855,867	762,634	93,233
2007	198,222	181,506	16,716	855,867	740,513	115,354
2008	199,400	180,677	18,723	870,910	726,276	144,634

* Statistics Department, Ministry of Health, Honduras.

Table 3. Coverage with the Measles-Rubella Vaccine in Follow-up Campaign: Denominator Comparison, Honduras, April to July 2008

Indicator	Percentage
MR administrative coverage in population aged 1-4 years; initial population figures	81
Population aged 1-4 years vaccinated with MR; verified through RMC	94
MR administrative coverage in population aged 1-4 years; adjusted population figures	97

by the Department of Statistics of the Ministry of Health compared to the figures adjusted by INE in 2008 showed an average discrepancy for the period 2006-2008 of 14,832 children aged <1 year and of more than 117,00 children aged 1-4 years. For the period 2004-2005, adjusted population figures are greater, illustrating problems with estimates in this age group (Table 2).

Based on the discrepancies found, the EPI made corrections to the denominators used to calculate the vaccination coverage rates in children aged <5 years at national, departmental, and municipal levels, starting in 2004.

In April 2008, Honduras launched its fourth follow-up measles and rubella campaign. The campaign was extended until June because the administrative coverage reached 81%. PAHO provided technical support by sending international consultants to help verify campaign coverage in the country's 298 municipalities. The result of the first rapid coverage monitoring (RCM) revealed a proportion of vaccinated children $\geq 95\%$ in 260 out of the 298 municipalities. For the other 38

municipalities, 11 had a proportion between 90 and 94% and 27 had a proportion <90%. In general, suggested coverage through RCM was greater than reported administrative coverage. When comparing the administrative coverage to the proportion of vaccinated children from the first RCM (94%) and to coverage calculated with adjusted figures for children aged 1-4 years (97%), results show coverage >81% (Table 3).

Conclusion

At national level, indicators from the routine immunization program, vaccination campaigns, and the results of systematic RCM allow for the validation of INE demographic projections for the population aged <5 years. However, INE has not yet adjusted the official projections of total population. Therefore, partnerships with national and external institutions providing a specialized technical assistance in the area of demographics are needed to identify and apply methodologies to revise and adjust the official demographic data to be used by the EPI. ■

1 *Immunization Newsletter*, October 2007, Volume XXIX, Number 5: Summary of EPI Evaluation in Honduras. Available at: <http://www.paho.org/english/ad/fch/im/sne2905.pdf>.

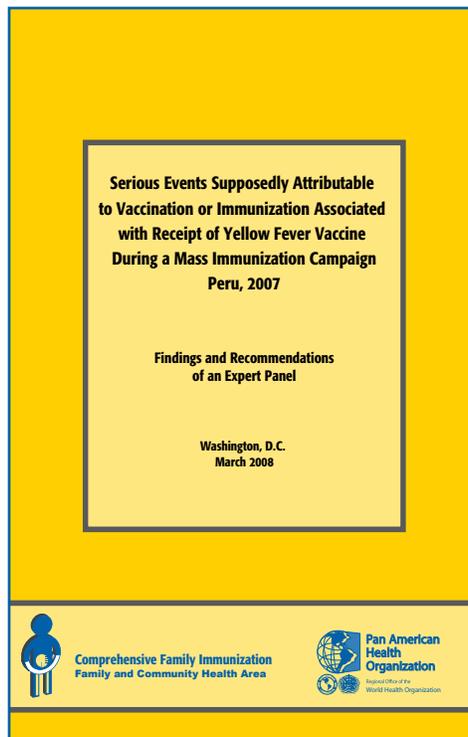
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developed suspected YEL-AVD. This was the first time that multiple YEL-AVD cases had clustered within a short timeframe (patients were immunized between 23 September and 1 October 2007) and a delimited space (Ica Region, Peru). Four persons died (case-fatality rate 80%). All four fatal cases occurred within a population of ~43,000 who had received a single lot of 17DD vaccine (designated 050VFA-121Z, referred to below as 121Z) manufactured by a producer from Brazil prequalified by the World Health Organization. A second vaccine lot (123Z) from the same manufacturer had been used in ~20,000 persons in the mass campaign in Ica Region without any associated cases of YEL-AVD. The vaccine lot used in a 5th (non-fatal, but hospitalized) case is unknown. No ESAVIs were reported when lot 121Z was administered in Venezuela prior to its use in Peru. However, this finding should be interpreted with caution due to limited sensitivity of passive ESAVI surveillance systems.

A statement was issued by the Pan American Health Organization/World Health Organization (PAHO/WHO) on 2 November 2007¹ to alert the global public health community to the occurrence and investigation of yellow fever ESAVIs. It provided preliminary information on the four fatal cases and outlined a series of steps in the planned investigation for determining the etiological role of yellow fever vaccine in the adverse events, reviewing the manufacturing and control of the implicated vaccine lot, conducting enhanced surveillance to detect adverse events, and conducting additional case-finding studies in Peru. Use of the 121Z lot and related lots was suspended pending investigation of a possible causal role in the adverse events. An Expert Panel was convened on 1 November to review preliminary data and lead the investigation. The panel met again on 4-5 March 2008, together with representatives of the Ministry of Health of Peru, the vaccine manufacturer, and PAHO/WHO staff. This article summarizes the results and conclusions of the laboratory and field investigations that were conducted between November 2007 and February 2008.

Epidemiological Investigations and Search for Additional Cases

In addition to cases detected by Peru's ESAVI surveillance system, retrospective case-finding investigations were conducted in November



2007 by personnel from the Ministry of Health and allied institutions in Peru and by the Centers for Disease Control and Prevention (CDC), Fort Collins (USA). No other suspect YEL-AVD cases were detected, despite an intensive review of over 28,000 hospital records in Ica Region.

Description of the Cases

The affected patients presented with a similar clinical syndrome, including fever, headache, malaise, and gastrointestinal symptoms, that progressed to shock. Symptoms started <1 day to 7-18 days (date of onset for one of the fatal cases is unclear) after vaccination. Cases 1-4 had received yellow fever vaccine for the first time; prior vaccination history in case 5 is unknown. All four fatal cases were classified as confirmed YEL-AVD and the case that survived was classified as probable YEL-AVD.

The five cases occurred in a population naive for yellow fever infection or vaccination. However, none of the cases had a clear contraindication to vaccination. Only a 79 year-old case had a precaution (advanced age is a known pre-disposing risk factor for YEL-AVD). In general, persons of this age should not receive the vaccine unless there is a clear risk of exposure to wild-type virus. In two cases, treatment with immunosuppressive drugs might have enhanced infection with the vaccine. The panel also noted that autoimmune disease might constitute a new risk factor for adverse events following yellow fever vaccination.

One of the five cases in Peru had rheumatoid arthritis and systemic lupus and another case had thyroiditis noted on autopsy. At least two other previous YEL-AVD cases (in the US and Brazil) also had lupus. There was no evidence for a concurrent infection with an unrelated agent (although one case had serologic conversion to typhoid O and typhoid H antigens), or a common environmental or toxic exposure, and no concomitant medications shared by all patients that could explain the severity or outcome of illness in the patients with YEL-AVD in Ica. However, it should be recognized that there has been no systematic investigation of the potential role of another infectious agent in the YEL-AVD cases.

The Panel noted that the management and treatment of patients with YEL-AVD was difficult and that little guidance was available. The last meeting on the management of patients with yellow fever (wild-type) was held by PAHO in 1985. Similarly, an established protocol for the investigation of yellow fever ESAVI cases, including the collection, handling, and testing of serological and virological specimens, was lacking. Such a protocol has been developed in Brazil and would be useful to facilitate systematic investigation of future cases throughout regions where yellow fever vaccinations are performed.

Virological Analyses

The laboratory diagnosis of the cases was undertaken by the National Institute of Health (*Instituto Nacional de Salud*) of Peru, the United States Naval Medical Research Center Detachment (NMRCD), and by CDC Atlanta and Fort Collins. Examination revealed a wide tissue distribution of virus (including many vital organs), high viremia, high virus load, and high antibody titers consistent with previous reports of cases who had died following yellow fever immunization. The genomic sequences of viral RNA from three cases were also determined.

The manufacturer reported that the full genomic consensus sequence of the 121Z lot was determined and showed no changes from the secondary seed 102/84. In addition, approximately 75 clones of each of three vaccine lots, including the 121Z and 123Z lots used in Ica, were partially sequenced (E gene) confirming that the vaccines contained a 'genetic swarm' of multiple virion subpopulations differing at approximately 0.15% of their amino acids. Most important was the finding that the 121Z lot virus consensus sequences obtained from vital organs from three of the confirmed YEL-AVD cases were indistinguishable from the parental 17DD secondary

¹ Available at: http://www.paho.org/English/AD/FCH/IM/PAHO_WHOStatement_YellowFever_Nov_07.pdf.

seed lot used since 1984. These findings provide strong evidence that the vaccine virus is genetically stable and that no mutations occurred during replication in the affected host, or selection of a variant subpopulation from the vaccine that was responsible for enhanced virulence. If mutation or selection had occurred, and was responsible for the tissue and organ damage seen in cases with severe infections, it would be expected that the altered virus would represent at least 10% of the total virion population and thus be detectable in a consensus sequence. Finally, no change in potency between original release and end-of-shelf-life samples was found, indicating that there were no altered (low) dose or changes in vaccine potency in the vaccine lot.

The panel emphasized the importance of the need for a WHO repository of samples and vaccine viruses involved in YEL-AVD cases for future studies as new scientific advances and technological approaches to elucidating the pathogenesis of YEL-AVD become available.

Inspection of the Manufacturing Facility

A site visit by an expert team reviewed batch production records and the manufacturing facilities. No deviations or other issues impacting product quality relevant to the adverse events were found. A one-off test of the 121Z lot for human adventitious agents was recommended to exclude the remote possibility of a contaminant in this lot. A supply of the 121Z lot and selected sister lots should be retained indefinitely to allow for future studies.

In summary, the committee concluded that the high incidence of YEL-AVD observed in Ica, Peru, remains unexplained. The panel noted that population-based factors were probably very important in this event. The cases occurred in the setting of a mass immunization campaign in a non-endemic area, where yellow fever vaccinations had not previously been used, where the population had no background immunity to yellow fever, where large numbers of adults, including elderly people, were vaccinated, and where ESAVI surveillance was heightened. The panel believed that the risk of YEL-AVD in such a setting is substantially higher than in other situations where mass campaigns are undertaken in endemic areas where a high background of immunity to yellow fever exists. To better define the risk of YEL-AVD in South America, a high priority should be placed on obtaining data on YEL-AVD incidence in other similar circumstances where mass campaigns have been performed outside enzootic areas.

Main Recommendations

These recommendations cover a spectrum of activities that should be undertaken to improve knowledge of the risk of adverse events associated with yellow fever vaccines, and steps to reduce such risk, as well as to guide the clinical management of such cases, thereby potentially improving outcomes.

- Communicating the information:
 - Risk communication related to information about ESAVIs should be balanced with communication about risks of yellow fever and vaccine effectiveness in preventing yellow fever.
 - PAHO should make the report of the Expert Panel² available to international panels.³
- Investigating the cases further:
 - Conducting further virological evaluation of the Ica YEL-AVD cases.
 - Obtaining results of host DNA testing of the four fatal cases to identify potential genetic factors responsible for increased susceptibility.
 - Considering further host factor evaluation among YEL-AVD survivors to be able to further explore the role of the immune system (innate immunity).
 - Considering the potential role of yellow fever vaccine virus and other infectious agents as co-factors in YEL-AVD.
 - Ensuring that specimens from YEL-AVD cases, virus isolates, and retained samples of lot 121Z (and sister lots) be retained indefinitely and be made available to bona fide researchers in the future who may develop new tools for determining causality and pathogenesis.
 - WHO should develop a protocol for investigating YEL-AVD.
- Revisiting the case reports for YEL-AVD cases reported previously to document the relevance of diarrhea as a clinical feature of this condition.
- Considering revising the Guidelines for Clinical Case Management of Yellow Fever, and including the management of YEL-AVD and YEL-AND (yellow fever vaccine-associated neurotropic disease), by PAHO/WHO.

2 PAHO. Serious Events Supposedly Attributable to Vaccination or Immunization Associated with Receipt of Yellow Fever Vaccine During a Mass Immunization Campaign, Peru, 2007 – Findings and Recommendations of an Expert Panel. Washington, D.C., 2008. Available at: http://new.paho.org/hq/index.php?option=com_content&task=view&id=278&Itemid=2032&lang=en.

3 The Expert Panel report was presented to the WHO Global Advisory Committee on Vaccine Safety (GACVS) in June 2008. See WHO. Meeting of Global Advisory Committee on Vaccine Safety, 18–19 June 2008. *WER*, No. 32, 2008, 83, 285–292, available at: <http://www.who.int/wer/2008/wer8332.pdf>.

- Improving information on incidence of adverse events and risk factors:
 - Countries should consider establishing real-time vaccine registries, using computer-searchable databases, when administering yellow fever vaccines either in vaccine campaigns or during routine immunization.
 - Countries should consider surveying vaccinated populations following yellow fever vaccination campaigns, including epidemiological and laboratory-based studies, in order to evaluate the vaccine coverage rate and whether recommendations for vaccination have been followed, e.g., whether higher risk populations or individuals were vaccinated during the campaign. The outcomes of such surveys should be used to elucidate clearer guidance for precautions and contraindications for yellow fever vaccine use. The incidence of vaccine-associated adverse events should be documented in campaigns conducted outside endemic regions. The age- and sex-specific rates should be determined, and rates calculated by other risk categories, where possible. Incidence should be expressed with common denominators, e.g., x per 100,000 doses.
- WHO should review information contained in the yellow fever vaccine product inserts (product labeling) from different manufacturers to ensure that adequate information on adverse events is provided and up to date. New precautions against use of immunomodulating drugs in the 10 days following yellow fever vaccination (i.e., until immunity appears) may be warranted.
- WHO and countries should consider the role of autoimmune conditions, such as systemic lupus erythematosus, ulcerative colitis, Crohn's disease, and rheumatoid arthritis, as possible risk factors for severe YEL-AVD.
- Countries should consider providing all health care providers and vaccinees a simple information sheet with indications and contraindications for vaccination and description of potential adverse events.
- PAHO/WHO should encourage collection of specific data on the incidence of YEL-AVD (and YEL-AND) in endemic versus non-endemic areas (where the background of yellow fever immunity is low).
- The WHO Requirements for Yellow Fever Vaccine (dated 1998) should be reviewed with consideration to the value of genetic testing. ■

Note: The United States Advisory Committee on Immunization Practices (ACIP) has developed provisional recommendations (22 October 2009) regarding the use of yellow fever vaccine. They are available at: <http://www.cdc.gov/vaccines/recs/provisional/default.htm#acip>.

PAHO Revolving Fund: Vaccine and Syringe Prices, 2010

In 2009, 38 countries and territories in Latin America and the Caribbean were supported by the PAHO Revolving Fund (RF) regarding their requirements for vaccines, syringes, and related cold chain supplies. The RF supplied approximately 156 million doses of vaccines with a value of US \$304.7 million. These figures include the first orders of H1N1 vaccine amounting to \$2.9 millions for 393,600 doses.

In 2010, the RF welcomes Chile as a new participating Member State. This year, a total of 46 vaccine presentations are being offered to participating countries, including new additions such as the human papillomavirus vaccine (Table 1). The RF also welcomes new suppliers as the vaccines they offer obtained WHO-prequalification. Forecasts for 2010 place the RF supply at around 155 million doses with a value of approximately

\$320 millions. These figures do not include 20.4 million doses of H1N1 vaccine with a value of \$140 million.

Regarding syringes, there were four suppliers in 2009 for 10 different types of syringes. The RF supplied 55.8 million of syringes with a value of \$2.4 million. Of those syringes, 71% were disposable and 29% were auto-disable. For 2010, a new syringe supplier has been included (Table 2). Forecasts for 2010 are for 78.4 million of units to be purchased, 72% disposable and 28% auto-disable. ■

Table 1. Prices for Vaccines Purchased Through the PAHO Revolving Fund, 2010 (Prices in US\$)

Vaccine		Doses per Vial	Average Cost per Dose	Vaccine		Doses per Vial	Average Cost per Dose
BCG		10	0.0995	Measles/Rubella		1	1.3500
DT Pediatric		10	0.0850			10	0.5280
DTP		10	0.1450	Measles/Mumps (Zagreb Strain)/Rubella		1	1.5500
DTP-Hepatitis B-Hib	Lyophilized	1	3.3000			10	0.9200
	Liquid	1	3.2000	Measles/Mumps (Urabe Strain)/Rubella		1	2.6500
DTP-Hib	Lyophilized	1	3.9000	Meningococcal A+C Polysaccharide		10	0.8500
	Liquid	10	3.3000	Meningococcal C Conjugate		1	14.0000
Hepatitis A	Adult	1	8.5000	Pneumococcal Adult Polysaccharide		1	7.0000
	Pediatric	1	7.2500			5	6.9500
Hepatitis B (Recombinant)	Adult	1	0.4500	Pneumococcal Pediatric Conjugate		1	20.0000
		10	0.2524	Polio, Oral (glass)		10	0.1908
	Pediatric	1	0.2770	Polio, Oral (plastic)		10	0.1908
Hib	Lyophilized	1	2.2500			20	0.1800
	Liquid	1	3.2000	Polio, Inactivated (with syringe)		1	4.5000
Human Papillomavirus		1	32.0000	Rabies Human Use (Vero Cells), French Origin		1	10.8913
Influenza H1N1 (without adjuvant)	French/US Origin	10	7.5000	Rabies Human Use (Purified Chick Embryo Cell Culture), Indian Origin		1	10.8913
	UK Origin	10	7.0000	Rotavirus Liquid		1	7.5000
Influenza H1N1 (with adjuvant), German Origin		17	5.5000			1	5.1500
Influenza Seasonal Southern Hemisphere Trivalent French Origin	Adult (with prefilled syringe)	1	9.0000	Td Adult		10	0.0780
	Adult	10	8.5000	Tdap Triple Acellular Adolescent/Adult		1	8.8688
	Pediatric (with prefilled syringe)	1	9.0000	Varicella		1	7.9000
	Pediatric	20	4.2500	Yellow Fever		10	0.6500
Influenza Seasonal, Southern Hemisphere Bivalent, Korean Origin Pediatric (with prefilled syringe)		1	3.1000			10	1.1500

Table 2. Prices for Syringes Purchased Through the PAHO Revolving Fund, 2010 (prices in US\$)

Disposable Syringes, Plastic with Attached Needle			Auto-disable Syringes, Plastic with Attached Needle		
Size	Packed per Case	Unit Cost *	Size	Packed per Case	Unit Cost *
1cc 22G x 1-1/2"	3600	0.0395	0.5cc 23G x 1"	3000	0.052
		0.0239		2400	0.05
	800	0.0525		1300	0.052
1cc 23G x 1"	3600	0.0395	0.5cc 25G x 5/8"	1300	0.052
		0.0239		800	0.05
	2000	0.031		3000	0.052
1cc 25G x 5/8"	3600	0.0395	0.5cc 26G x 3/8"	1300	0.052
		0.0239		3000	0.052
	2000	0.033	0.1cc 27G x 3/8"	3000	0.071
1cc 26G x 3/8"	3600	0.0239			
	2000	0.034			
5cc 22G x 1-1/2"	1200	0.028			
	1000	0.034			

* Prices FCA (Free Carrier) for each syringe.

2009 AFP Rate Reaches Lowest Level in 10 Years

Surveillance of acute flaccid paralysis (AFP) has been a cornerstone of the polio eradication efforts in the Americas and the world. Each case of AFP in persons aged <15 years that is clearly not due to severe trauma should be investigated to discard polio.¹ Confirming or discarding paralytic poliomyelitis in the acute phase based on clinical symptoms and signs alone is difficult, given that a large number of other diseases and conditions may cause similar symptoms. The two diseases most frequently confused with polio are Guillain-Barré syndrome (GBS) and transverse myelitis.

The sensitivity of the polio surveillance program is evaluated by the rate of AFP cases. Based on the expected GBS rate among children aged <15 years, a minimum expected rate of AFP cases was globally set to 1 AFP case per 100,000 children aged <15 years (although some countries have set greater expected rates). The detection and reporting of an AFP case triggers an immediate public health response. All reported AFP cases should be investigated within 48 hours of being reported, regardless of vaccination history or the opinion of attending clinicians, and outbreak control measures should begin.

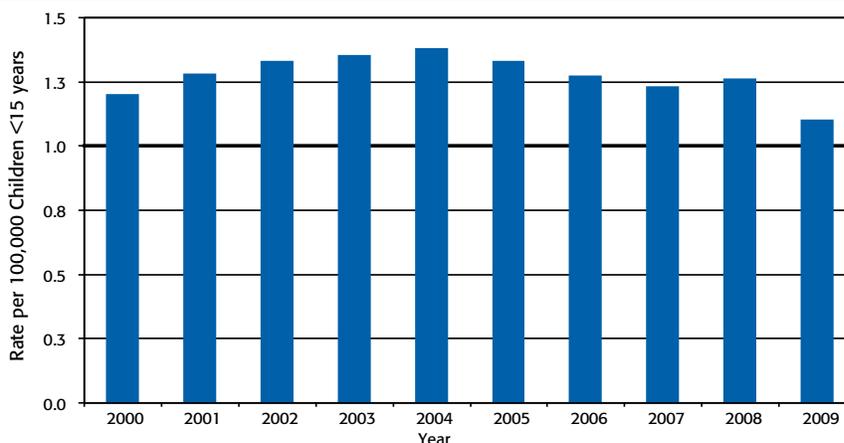
The Americas were certified as polio-free by the International Commission for the Certification of Poliomyelitis Eradication in the Americas (ICCPE) in 1994. Two of the criteria evaluated to certify

polio elimination were related to AFP surveillance: (1) the quality of surveillance for AFP and (2) active AFP case-finding in areas of poor surveillance. In spite of this certification, children of the Americas remain at risk of contracting polio because the wild poliovirus remains endemic in four countries (Afghanistan, India, Nigeria, and Pakistan) and several cases due to importations continue to occur in other regions of the world. Furthermore, vaccine-derived virus can be reintroduced in municipalities, departments, provinces, or countries with low vaccination coverage, as occurred in Haiti and the Dominican

Republic in 2000 and 2001. In order to detect an outbreak in a timely manner, the countries of the Americas should continue to comply with the AFP surveillance indicators, particularly the detection, reporting, and investigation of AFP cases.

In 2009, the Region of the Americas reached an AFP rate of 1.1 per 100,000 children aged <15 years, the lowest AFP rate in 10 years (Figure 1). Seven Latin American countries and the Caribbean did not reach the minimum target of 1, and in 10 countries the AFP rate trend was descending. In light of the situation, the Pan American Health Organization urges countries to assess their AFP surveillance data and, for those areas not reaching the AFP indicator of 1 case per 100,000 children aged <15 years, to conduct retrospective case searches. ■

Figure 1. Acute Flaccid Paralysis Rate per 100,000 children <15 Years of Age, Latin America and the Caribbean, 2000-2009



Source: Country reports to the Poliomyelitis Eradication Surveillance Systems (PESS).

1 If there is strong suspicion of polio in persons aged >15 years, such cases should also be thoroughly investigated.

Annual Summary of AFP and Measles/Rubella Indicators, 2009

Acute Flaccid Paralysis (AFP) Surveillance Indicators (Period Between Epidemiological Weeks 01 to 52, 2009)

Country	Number of AFP Cases	AFP Rate per 100,000 <15 Years Old	% of Cases Investigated <48 Hours	% of Cases with 1 Sample Taken Within 14 Days of Onset	% of Sites Reporting Weekly
Argentina	138	1.36	84	81	94
Bolivia	46	1.27	91	72	79
Brazil	548	1.11	97	77	92
Canada	58	1.03	...	...	...
CAREC	21	0.50	90	38	99
Chile	98	2.54	76	72	99
Colombia	168	1.28	92	85	71
Costa Rica	15	1.22	100	0	0
Cuba	26	1.29	100	92	100
Dominican Republic	25	0.76	64	72	87
Ecuador	32	0.74	97	97	88
El Salvador	66	2.82	100	76	85
Guatemala	34	0.58	82	88	0
Haiti	1	0.02	100	0	97
Honduras	69	2.04	87	87	93
Mexico	405	1.28	97	82	92
Nicaragua	19	0.94	74	68	100
Panama	10	1.00	90	90	88
Paraguay	22	1.10	64	73	87
Peru	91	1.09	91	65	95
United States	...	...	...	...	...
Uruguay	4	0.52	50	0	73
Venezuela	41	0.49	83	80	90
Total/Average	1879	1.14	92	78	89

NR: Not reporting.

Measles/Rubella Surveillance Indicators (Period between Epidemiological Weeks 01 to 52, 2009)

Country	% Sites Reporting Weekly	% of Cases with Adequate Investigation	% of Cases with Adequate Sample	% of Samples Received in Lab ≤5 Days	% of Lab Sample Results ≤4 Days	% of Cases Discarded by Lab
Argentina	90	75	100	90	97	100
Bolivia	79	99	100	74	76	100
Brazil	77	68	80	...	...	98
Canada	...	...	...	...	...	...
CAREC	99	68	97	33	94	96
Chile	99	8	90	63	78	88
Colombia	73	71	94	86	89	98
Costa Rica	57	44	59	79	52	97
Cuba	100	100	100	100	100	100
Dominican Republic	87	56	97	56	37	99
Ecuador	87	65	99	90	89	99
El Salvador	81	71	100	91	81	100
French Guiana	...	...	...	...	...	...
Guadeloupe	...	...	...	...	...	...
Guatemala	...	24	98	86	74	93
Haiti	100	0	100	50	50	...
Honduras	93	93	98	80	92	98
Martinique	...	...	...	...	...	...
Mexico	94	98	99	84	82	100
Nicaragua	100	85	98	95	72	99
Panama	88	88	98	88	92	99
Paraguay	88	65	99	87	100	100
Peru	94	95	99	65	79	95
Puerto Rico	...	...	...	...	...	...
United States	...	...	...	...	...	...
Uruguay	54	50	50	100	0	50
Venezuela	90	57	94	70	75	98
Average	86	76	89	81	84	98

...: No data.

Source: PESS and MESS and country reports to FCH-IM, PAHO.

Data as of 24 June 2010.

Peru's 2010 Budget Law: National Immunization Program Secures Funds

On 1 January 2010, Peru's Congress approved the new appropriation bill for fiscal year 2010. The law provides for an important budget allocation to be granted to the Ministry of Health, specifically to the Strategic Nutrition Program. The funds will be distributed to regional governments in connection with vaccine administration in children aged <5 years, and will be used to pay for vaccines and syringes, but also to defray operational costs.

In the Region of the Americas, few governments have provided for a specific budget line to cover operational expenses of the Expanded Program on Immunization. Therefore, Peru's law represents a milestone and a worthy example for other countries of the Western Hemisphere. ■



Picture: Ministry of Health, Peru.

The *Immunization Newsletter* is published every two months, in English, Spanish, and French by the Immunization Unit of the Pan American Health Organization (PAHO), Regional Office for the Americas of the World Health Organization (WHO). The purpose of the *Immunization Newsletter* 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 possible solutions to those problems.

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