EPI Newsletter

Expanded Program on Immunization in the Americas

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New polio case classification in effect

In light of the polio case data presented at the last meeting of the Technical Advisory Group on EPI and Polio Erradication (TAG) and the advances made in surveillance, the TAG concluded that a great number of the "probable polio" cases reported were being classified as "confirmed polio" only because of the presence of residual paralysis without proper stool sample analysis, because they were lost to follow-up and/or because of death. In order to minimize the possibility of "false positives", the TAG decided to revise the final classification as follows:

i. ***Confirmed poliomyelitis*** *- Acute paralytic illness associated with the isolation of wild poliovirus, irrespective of residual paralysis.*

ii. ***Vaccine-associated poliomyelitis*** *- Acute paralytic illness in which vaccine virus is believed to be the cause of the disease. Vaccine-associated cases should be reported separately. They are not considered to be the same as confirmed polio with wild poliovirus isolates.*

iii. ***Not poliomyelitis*** *- Acute paralytic illness in which at least two adequate stool specimens have been obtained within two weeks after onset of symptoms and have been found negative for poliovirus. Aliquots of the original samples should be held at the laboratory for possible future use. To ensure the accuracy of this categorization, any patient who dies, is lost to follow-up, or who has residual paralysis at 60 days should have aliquots of the original specimens examined in two other laboratories in the network, using all appropriate techniques. If the specimens were adequate and all are negative, even these patients will be considered as "not polio" and will be "discarded". This classification represents a major change from the current system.*

iv. Polio compatible *- Acute paralytic illness with compatible residual paralysis at 60 days, or death or loss to follow-up in which there were not at least two adequate stool specimens obtained within two weeks after onset of symptoms and examined in three different laboratories. This should be a very small proportion of cases.*

The five cases "confirmed" through the end of April 1990, should have been classified as "polio compatible", since to date, none have had wild virus isolated from the stool.

In this issue:

Rapid Neonatal Tetanus Survey Tested in Haiti

Neonatal tetanus (NNT) is one of the leading causes of infant mortality in the developing world and at the same time the most underreported fatal infectious disease. Fewer than 10% of cases come to the attention of the Ministry of Health statistician and the disease is seldom reported separately from tetanus at any age. Reliable incidence data are often not available, but it is estimated that NNT could contribute 10-30% of infant mortality. In many developing countries NNT accounts for half of all neonatal deaths (0-4 weeks), and despite extensive hospitalization, the case fatality rate ranges between 60 and 90%.

Haiti is the only country in group V of the WHO Classification of countries for NNT elimination, which is characterized by high incidence, low coverage with tetanus toxoid (TT) -- 2% of women of childbearing age -- and low percentage of clean deliveries (2%).

The application of a rapid assessment technique allows the estimation of the magnitude of the problem as well as the determination of the geographical distribution of NNT cases and hence the classification of high and low risk areas. This information can be crucial for targeting the implementation of control measures, such as immunizing all women of childbearing age (15-49 years) with TT and training traditional birth attendants (TBA's) in the techniques of clean delivery. In additon, it is imperative that the NNT problem get the attention of the Ministry of Health. A geographic display with epidemiological mapping can contribute to this.

The Rapid Neonatal Tetanus Survey was conducted for the first time in January, 1990 in Cap Haitien, capital of the northern region of Haiti, using hospital admission data from the "Hospital Justinien". All pediatric admissions under five weeks of age from 1987 to 1989 were reviewed and the geographic origin of the cases was established. For each NNT case found, five control cases with other diagnoses were randomly chosen from pediatric admission records. All controls were in the same age group and had been admitted during the same month; if three NNT cases occurred in November 1988, 15 controls under five weeks of age, admitted with other diagnoses such as prematurity, malaria, diarrhea, respiratory diseases were randomly selected from the same month of admission.

Plotting both cases and controls on a map displays the age-specific catchment area of the hospital and allows the identification of areas with NNT clusters and areas with unknown risk of transmission or access problems to the health system. If diseases other than NNT within the age group 0-4 weeks were admitted to the hospital from any given community, a case of NNT from the same area should have a high probability of also having been admitted. If the survey were repeated at certain intervals, not only could the change in the age specific catchment area be observed, but the control measures implemented could also be monitored over time.

Assuming a hospitalization rate of only 10% suggests a cluster of unreported cases for each known NNT case. Each case of NNT must be considered as a multiple failure of the health system which should result in the immediate implementation of control operations such as TT immunization campaigns and enhanced surveillance.

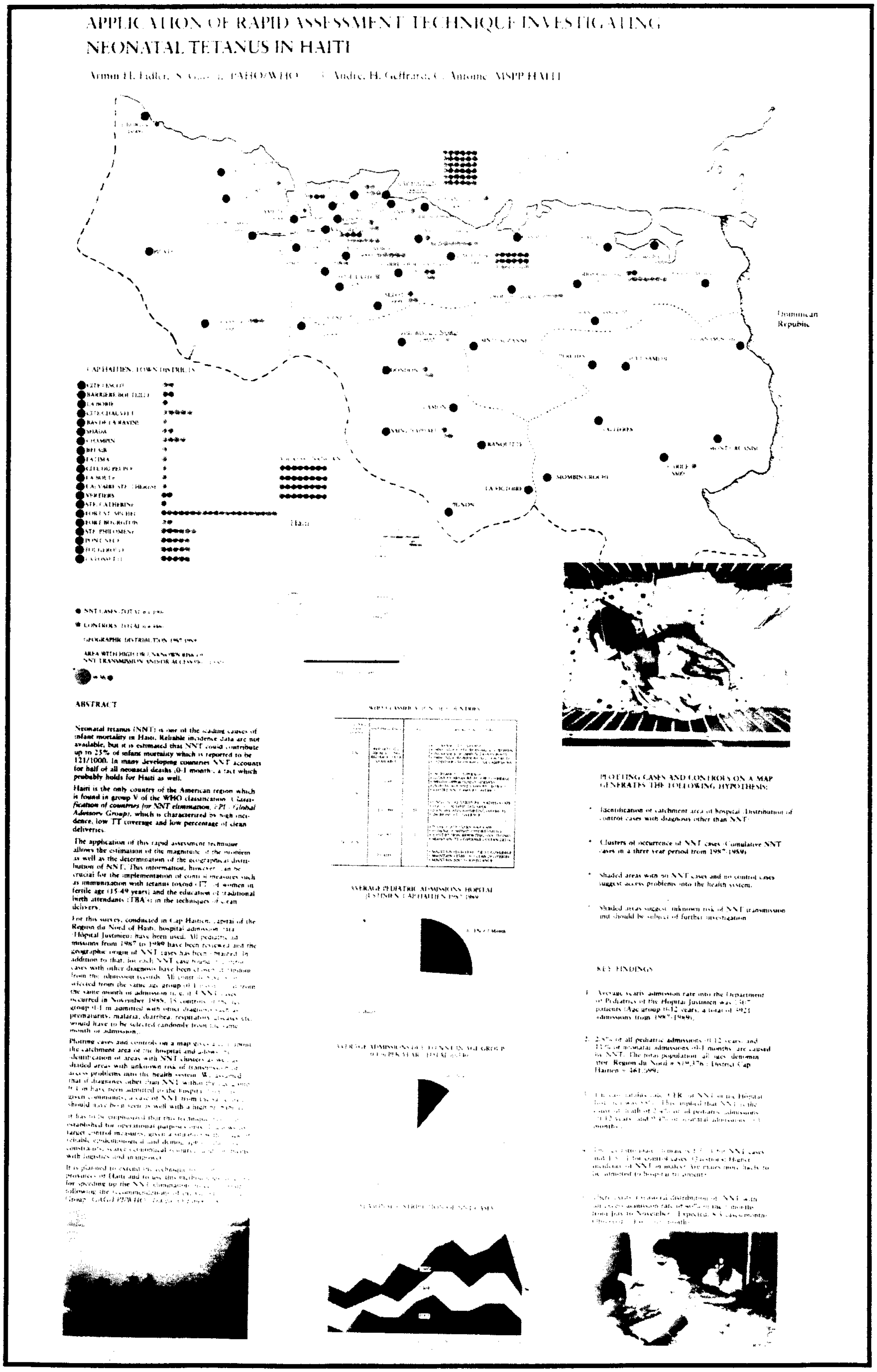
High risk areas which should be prime targets for further study and intervention are defined as all communities from which NNT cases have been admitted. All communities outside the age specific catchment area (that is, no NNT or non-NNT cases from that area have been admitted), are defined as areas of unknown risk. From a strict operational point of view, high risk areas and areas of unknown risk have to be treated equally.

Communities where control cases but no NNT cases have been admitted to the hospital are labeled as low risk areas. It can be assumed that a case of NNT would have been seen at the health facility with a high probability because of the documented admission of children with other diseases. Biased results must be expected if for some reason only non-NNT cases (controls) were brought to health facilities whereas NNT cases would die unrecognized in the community.

In areas where no information about the distribution of the risk of NNT is available and therefore the chance of identifying a high or a low risk area is 50:50, a sensitivity of the proposed survey of at least 75% could be considered as an operationally reasonable goal. If there is 25% better chance to target operations rather than implementing them at random, control measures could work more economically and the NNT elimination process could be speeded up in class IV and V countries. Further research is necessary in order to test the reliability of this technique in various settings.

The survey in its proposed form is a very fast and straightforward technique which requires no special skills or technical outfit. It does, however, require a minimum quality of health service records; date of admission, age, sex, diagnosis and geographic origin are essential. With the help of a well explained protocol, a health worker at the district level should be able to analyze at least 300 admissions per day. If more than one health service is analyzed, time for compilation and plotting of the findings on a single map should be allocated. Admissions data of all health services with inpatient care and sentinel centers in a health district should be analyzed on a regular (yearly) basis.

Source: Armin H. Fidler, S. García; PAHO/WHO and J. André, H. Geffrard, C. Antoine; MSPP, Haiti.



Editorial Note: *A poster session was included for the first time during the latest meeting of the EPI and Polio Eradication Technical Advisory Group (see page 4 for Conclusions and Recommendations). First prize was awarded to the poster displayed above. The article on the opposite page is an abstract of its content.*

Eighth TAG Meeting Held in Mexico City

The Eighth Meeting of the PAHO Technical Advisory Group (TAG) for the Expanded Program on Immunization and Polio Eradication took place in Mexico City March 19-22, 1990. Dr. Juan Manuel Sotelo, PAHO Representative in Mexico welcomed the participants in the name of the PAHO Director and Dr. Jesús Kumate, Minister of Health of Mexico opened the Meeting.

The considerable advances made by the countries since the meeting in Cartagena held in July, 1989 were noted. Particularly notable is the fact that it has now been more than three years since the last isolation of wild poliovirus in the countries of the Southern Cone, more than two years since the last isolation in Central America, and more than one year since the last isolation of wild poliovirus in Brazil. Also notable is the fact that there has not been a confirmed case of polio from which wild virus was isolated in the Region for more than five months.

In addition, there are important improvements in other program indicators, including significant increases in vaccine coverage in some countries (e.g., Colombia). Most countries are now reporting coverage by "municipio" and are tracking surveillance activities by performance of reporting units. In most countries, interagency coordinating committees have played an important role in strengthening programs. The laboratory network has also been strengthened significantly and advances in molecular biology promise to be an important additional tool in documenting interruption of transmission. The continued support of PAHO/WHO, UNICEF, AID, Rotary International, the Inter-American Development Bank (IDB), and the Canadian Public Health Association (CPHA) has been critical to these advances.

Notwithstanding the significant advances made, there remain substantial causes for concern. One of the most apparent is the fact that in some countries coverage levels are stagnant or even declining. There is concern regarding some countries' slow pace in increasing vaccination coverages, since it casts doubts on their ability to reach the goal of Universal Childhood Immunization within the specified time frame.

In spite of generally improving indices of surveillance and case investigation, the fact remains that 40% of cases considered as confirmed in 1989 either did not have stool specimens collected or did not have stool specimens collected within two weeks of onset of symptoms. Also disturbing is the low rate of participation by reporting sites in weekly reporting, whether positive or negative.

Faced with this mixture of progress and problems, the TAG made the following recommendations:

1. The fundamental strategy of the program remains sound - achieving high coverage levels, effective surveillance, and vigorous response to cases. Trivalent oral poliovirus vaccine remains the vaccine of choice.

2. Achievement and maintenance of high coverage levels requires consolidation of the progress already made. This must include managerial improvements and provision of adequate supplies to carry out programs. Governments must allocate the budgetary resources necessary to provide stability to program activities. The continued functioning of the Interagency Coordinating Committees (ICC's) with documentation (and dissemination) of the results of their meetings remains essential. In areas with inadequate coverage, extraordinary efforts must be undertaken to achieve the coverage needed, using a multi-antigen approach and a mix of all available strategies.

Furthermore, the TAG strongly endorsed the efforts being made by countries in the Americas toward achievement of Universal Childhood Immunization by 1990, and specifically the celebration of the Andean/Latin American Vaccination Day to be held on 29 April 1990.

3. In spite of significant improvements in surveillance

and case investigation, several further changes are warranted.

a. It is of the utmost importance that adequate stool specimens be obtained on all cases of acute flaccid paralysis in children less than 15 years of age. This requires adequate quality and quantity of the specimens as well as adequate information accompanying the specimens. The standard must be as follows: at least two separate stool specimens (each equivalent to "two thumbs" of material), obtained within the first two weeks after onset of symptoms (and prior to containment immunization), immediately transported under proper conditions to the laboratory, and accompanied by adequate epidemiological information.

b. Fecal specimens should be obtained from contacts (less than five years of age) of the patient at the same time they are obtained from the patient and should be clearly labeled as "contact" specimens to allow the laboratory to devote priority to patient specimens.

c. Rectal swabs should not be used to attempt virus isolation. Evaluation of the efficacy of rectal tubes in obtaining adequate stool samples should be pursued by the Americas as soon as possible.

d. DNA probe technology has great promise for environmental sampling and its further development should be pursued urgently. Once developed, surveillance should be expanded to include search for wild poliovirus. This should include searching for wild poliovirus in the environment under special circumstances and according to epidemiologic criteria. However, environmental sampling cannot replace diligent surveillance for cases of acute flaccid paralysis.

e. The offer of a reward to those reporting a confirmed polio case should be extensively publicized, especially to health workers to increase their interest overall and, particularly, to increase their motivation to report promptly and obtain stool samples promptly. This should be particularly useful in areas which have apparently been free of polio for some time. Rotary Clubs may be an important means of disseminating this information.

4. It is highly likely that paralytic polio is being overdiagnosed in the Region because of the large number of "probable" cases which are ultimately classified as "confirmed" for not having adequate diagnostic specimens collected and tested or being lost to follow-up or dying. To remedy this problem several steps are proposed:

a. Increased emphasis must be placed on adequate and timely collection and submission of stool specimens. This may be particularly important in obtaining post-mortem specimens, in which pathological specimens are also important.

b. Most importantly, the final case classification of polio should be revised. In preliminary reporting, the term "acute flaccid paralysis" should be used instead of "probable polio". However, it is in the final classification of cases that most change was required and the case classification presented on page 1 was adopted.

c. Major emphasis must be placed on ensuring timely and regular reporting from all reporting sites in a given area ("municipio", district, state, or country). Only when at least 90% of all sites are reporting negatively on a weekly basis, can confidence be placed on the apparent absence of acute flaccid paralysis.

d. Further diagnostic techniques should be developed and used to diagnose and distinguish between polio and Guillain-Barre Syndrome. Studies should be encouraged in other parts of the world to determine the excretion patterns of poliovirus in polio patients by, for example, taking daily stool specimens over the course of one month. In addition, development should proceed on serological tests capable of differentiating between wild virus-induced and vaccine virus-induced antibodies. Further studies on enterovirus-associated paralytic illness are also warranted. To improve comparative analysis of case information, the final diagnosis (and clinical information) of all "discarded" cases should be submitted to the Regional office. Studies are warranted to determine the expected rate of acute flaccid paralysis in different sub-Regions.

5. The TAG is concerned about the ability of several countries to achieve and document the eradication target unless significant new efforts are undertaken. These countries include Mexico, Venezuela, Bolivia, Brazil, Haiti, and Peru. Specific activities include increased vaccine coverage, expansion of surveillance systems to include prompt reporting from at least 90% of the reporting units, and social mobilization or promotion to assure that the population is aware of eradication efforts.

6. Recommendations of the Laboratory Network (see page 6) should be implemented.

7. Anticipating successful achievement of the eradication target, an independent Commission should be formed and charged with developing criteria for certification of eradication.

8. As the Americas approach eradication of polio, direct attention must be given to other diseases which are preventable by immunization. As a start, the TAG recommends that the added focus of attention should be neonatal tetanus and measles as described in the concept paper developed by PAHO. The ICC Member agencies should continue to support these efforts. We must not neglect the immediate target of polio eradication, nor should we fail to use the lessons learned to address other diseases vigorously.

a. Neonatal tetanus represents totally preventable morbidity and mortality. Universal immunization with tetanus toxoid of women of childbearing age can prevent this terrible health burden. Like other vaccine-preventable diseases, neonatal tetanus does not occur uniformly throughout the population. Several countries showed that surveillance information can be used to identify high-risk areas to focus programmatic efforts. A number of countries demonstrated that available information on neonatal deaths and cases reported, prenatal care, and the occur-

rence of missed opportunities, help design intervention strategies.

Countries that have already identified high-risk areas for neonatal tetanus should implement vaccination of all females of childbearing age including pregnant women any time during pregnancy, starting in the first trimester. Each woman should receive at least two doses of tetanus toxoid. Careful attention should be paid to surveillance of cases of neonatal tetanus, vaccine utilization, and eliminating missed opportunities. Each detected case represents a program failure and should be evaluated to determine how best to improve control. Other countries should begin the evaluation of available information to identify the highest risk areas, followed by interventions to prevent the disease.

b. In recent years, measles vaccine coverage in many countries of the hemisphere has increased and the overall impact has been demonstrated by the decrease in cases reported, changes in the age distribution of cases, and increasing interval between epidemics. Despite the occurrence of epidemics of measles, it should be remembered that in the absence of vaccination, the number of cases expected annually would approximate 95% of the number of births. Nevertheless, the number of cases reported in 1989 in some countries of the hemisphere was unusually high compared to recent years. This raises questions concerning what the appropriate future strategy for measles control or elimination should be.

The TAG recommends that all countries make efforts to improve coverage for measles vaccine to the highest possible level. Between now and the next meeting of the TAG, studies should be undertaken to develop the information base needed to make recommendations concerning strategies for control of measles outbreaks.

Experience in some countries has shown that where coverage is below 90%, efforts to control outbreaks represent a diversion of scarce resources that could better be used for improving coverage either through mass vaccination days or institutional delivery. However, this issue deserves review and data from current outbreaks should be collected and analyzed. Experience with mathematical models may be useful in developing the strategy.

9. Further studies of missed opportunities and innovative approaches to reduce these system failures (such as those carried out in El Salvador and Colombia) should be aggressively pursued by all countries.

10. The TAG should meet again in 6-9 months to review progress in implementing these recommendations, plans for certification of the eradication program, and further activities needed to bring about satisfactory control of the other vaccine-preventable diseases, particularly neonatal tetanus and measles.

Reference Laboratories Meet to Review Progress

Once again, the members of the Polio Laboratory Network met before the TAG meeting, from 16 to 18 March, to discuss and review their activities and the problems encountered to date. Following is a summary of their major recommendations:

1. The laboratories should report within four weeks for samples with negative results; six weeks for samples which have had virus isolated from stools; and, four weeks from receipt of isolates received for intratypic differentiation.

2. All poliovirus strains isolated from probable cases or their contacts should be characterized immediately by DNA probes. To meet this requirement, new generation nucleic acid hybridization probes will be distributed to all Network laboratories, the identities of all isolates tested by the probes should be confirmed with PCR, and genomic sequence analysis should be performed on all wild poliovirus isolates in order to identify their probable endemic origins.

3. Reisolation should be attempted from all original specimens which have yielded wild poliovirus.

4. Special isolation techniques --including acid treatment and samples concentration-- should be used to attempt virus isolation from the stools of confirmed cases which have previously yielded negative results. Epidemiologists are urged to collect sufficient quantities of material to complete these tasks. Therefore, rectal swabs are totally inadequate as stool samples and have no place in the polio eradication program.

5. Studies aimed at achieving the direct detection and identification of wild poliovirus from clinical specimens, such as with the use of elevated incubation temperatures, wild-genotype-specific nucleic acid probes, and PCR, should be continued.

6. The laboratories will examine stools from contacts only when the index case is a confirmed polio case and the stool sample analysis yielded negative results. Appropriate contacts for sample collection should not have received OPV during the previous 30 days and should be under five years of age.

7. Negative specimens from clinically confirmed cases should be examined by two additional Network laboratories in order to improve chances for virus isolation. Special attention must be given to appropriate international transport of original clinical specimens which often have low virus titers.

8. Standardized HEp-2(C) cell lines with improved sensitivity to poliovirus infection will be distributed by WHO to all Network laboratories, along with protocols for their handling. Poliovirus isolations will be attempted using HEp-2(C) (WHO), RD (CDC), and other appropriate cells selected by individual laboratories.

Reported Cases of EPI Diseases

Number of reported cases of measles, poliomyelitis, tetanus, diphtheria, and whooping cough, from 1 January 1989 to date of last report, and for same epidemiological period in 1988, by country.

Subregion and country	Date of last Report	Measles		Poliomyelitis #		Tetanus				Diphtheria		Whooping Cough	
						Non Neonatal		Neonatal					
		1989	1988	1989	1988	1989	1988	1989	1988	1989	1988	1989	1988
LATIN AMERICA													
Andean Region													
Bolivia	31 Dec.	484	1 818	2	2	...	30	...	67	9	9	717	685
Colombia	31 Dec.	10 235	15 732	14	41	108	193	...	...	35	23	1 668	1 994
Ecuador	31 Dec.	2 403	7 990	5	9	40	129	58	128	3	8	256	109
Peru	31 Dec.	518	3 180	18	55	70	10	...	112	...	36	...	806
Venezuela	31 Dec.	9 554	12 203	16	20	44	17	...	24	0	2	590	465
Southern Cone													
Argentina(v)	31 Dec.	4 009	4 836	0	4	62	80	72	...	11	8	2 936	3 737
Chile	31 Dec.	11 904	45 079	0	0	14	14	2	5	36	132	206	224
Paraguay	31 Dec.	220	772	0	0	121	62	37	52	8	13	371	886
Uruguay (v)	31 Dec.	18	76	1	0	5	2	0	0	0	0	40	25
Brazil	31 Dec.	19 454	26 179	36	106	1 557	1 842	299	324	846	987	11 112	8 868
Central America													
Belize	31 Dec.	11	74	0	0	0	0	0	0	0	0	1	0
Costa Rica	31 Dec.	33	358	0	0	2	5	0	2	0	0	85	95
El Salvador	31 Dec.	15 917	787	3	12	24	50	24	33	0	0	34	46
Guatemala	31 Dec.	2 415	182	3	38	15	67	...	29	...	...	...	725
Honduras	31 Dec.	6 653	1 155	1	6	13	21	16	11	0	0	75	235
Nicaragua	31 Dec.	130	167	0	0	54	67	17	27	0	0	324	63
Panama	31 Dec.	287	364	0	0	5	2	9	6	...	0	36	29
Mexico	31 Dec.	20 076	3 915	27	18	177	303	35	127	6	2	1 468	693
Latin Caribbean													
Cuba	31 Dec.	12	122	0	0	6	5	0	0	0	0	...	32
Dominican Republic	31 Dec.	1 867	692	0	1	41	104	17	33	36	75	361	104
Haiti	31 Dec.	...	...	2	9	...	...	...	...	...	...	...	...
CARIBBEAN													
Antigua & Barbuda	31 Dec.	0	0	0	0	0	0	0	0	0	0	0	0
Bahamas	31 Dec.	60	22	0	0	1	1	...	0	0	0	0	0
Barbados	31 Dec.	2	1	0	0	2	1	...	0	0	0	0	0
Dominica	31 Dec.	9	10	0	0	0	1	0	0	0	0	0	0
Grenada	31 Dec.	2	4	0	0	1	0	...	0	0	1	0	2
Guyana	31 Dec.	11	917	0	0	0	6	0	0	0	0	0	0
Jamaica	31 Dec.	5 778	30	0	0	5	3	...	0	5	5	3	7
St. Cristopher/Nevis	31 Dec.	12	12	0	0	0	0	0	0	...	...	0	0
St. Lucia	31 Dec.	10	4	0	0	0	1	0	0	0	0	0	0
St. Vincent & Grenadines	31 Dec.	1	10	0	0	3	1	0	0	0	0	0	1
Suriname	31 Dec.	0	68	0	0	2	1	...	1	0	0	0	0
Trinidad & Tobago	31 Dec.	2 180	388	0	0	11	4	...	...	0	0	2	11
NORTH AMERICA													
Canada**(v)	31 Dec.	958	609	0	3	2	3	...	...	3	11	1 759	1 106
United States**(v)	31 Dec.	16 236	3 065	0	9	46	48	...	...	2	1	3 745	3 379

* Country does not report neonatal tetanus data separately.
\# Data for polio includes only confirmed cases through week 52 (ending 30 December, 1989).
(v) All polio cases are vaccine -related.
(i) Polio cases are imported.
... Data not available.

EPI Vaccination Coverage in the Americas, 1988 and 1989

REGION AND COUNTRY	Population under one		OPV3		DPT3		MEASLES		BCG	
	1988	1989	1988	1989	1988	1989	1988	1989	1988	1989
Andean Region	**2 612 613**	**2 661 002**	**71**	**71**	**61**	**61**	**58**	**61**	**72**	**76**
Bolivia	263 800	271 200	40	50	39	40	44	70	27	70
Colombia	816 960	834 180	94	93	74	75	74	73	99	90
Ecuador	312 353	316 622	57	64	54	55	52	57	86	91
Peru	665 000	670 000	61	60	61	58	52	52	70	62
Venezuela	554 500	569 000	74	67	56	55	51	50	50	68
Brazil	**4 217 375**	**4 307 582**	**89**	**97**	**54**	**54**	**60**	**58**	**67**	**70**
Central America	**984 017**	**1 006 674**	**68**	**72**	**63**	**65**	**67**	**68**	**66**	**77**
Belize	5 270	6 701	73	71	73	71	70	68	97	87
Costa Rica	80 500	82 600	86	91	87	89	97	88	87	---
El Salvador	176 102	182 173	63	72	63	64	63	73	56	62
Guatemala	328 000	343 200	58	58	49	52	55	53	41	---
Honduras	191 019	183 600	70	83	74	78	76	86	84	75
Nicaragua	142 600	146 500	83	83	65	64	63	62	89	90
Panama	60 526	61 900	73	72	75	71	75	76	91	90
Southern Cone	**1 139 601**	**1 125 627**	**91**	**84**	**82**	**79**	**86**	**80**	**95**	**90**
Argentina	680 000	668 000	91	81	80	74	88	79	99	94
Chile	287 981	279 150	96	95	96	95	95	91	98	95
Paraguay	118 620	121 877	86	71	56	67	63	58	56	58
Uruguay	53 000	56 600	82	82	82	82	72	76	98	97
Latin Caribbean	**594 713**	**591 536**	**69**	**71**	**61**	**62**	**58**	**56**	**61**	**57**
Cuba	180 400	187 529	98	95	98	95	89	97	99	97
Dominican Republic	212 606	202 300	65	70	41	43	29	43	43	38
Haiti	201 707	201 707	48	50	49	50	59	31	45	40
Mexico	**2 100 000**	**2 579 200**	**95**	**96**	**60**	**65**	**70**	**85**	**73**	**80**
English Caribbean	**134 194**	**131 672**	**80**	**82**	**79**	**82**	**71**	**72**	**87**	**95**
Anguilla	186	157	99	99	99	99	98	92	90	99
Antigua	1 080	1 088	99	99	98	99	95	95	-	-
Bahamas	5 600	5 641	84	82	85	86	78	87	-	-
Barbados	4 032	4 032	73	80	76	78	84	85	-	-
Cayman Islands	358	378	95	93	93	93	99	89	86	81
Dominica	1 648	1 715	97	94	96	92	90	88	98	99
Grenada	3 057	2 613	64	86	65	87	58	89	-	-
Guyana	20 000	17 658	69	79	64	77	55	69	64	76
Jamaica	52 270	57 487	83	84	82	85	68	71	96	99
Montserrat	199	199	91	93	91	93	86	89	86	60
St. Kitts/Nevis	924	924	93	99	94	99	77	90	-	-
St. Lucia	3 722	3 530	87	93	78	92	83	91	85	99
St. Vincent	2 708	2 482	97	97	98	98	97	99	95	99
Suriname	10 000	10 000	71	71	71	72	91	73	-	-
Trinidad/Tobago	28 000	23 280	83	77	82	77	72	59	-	-
Turks/Caicos Islands	220	250	92	89	94	89	92	76	94	99
British Virgin Islands	190	238	76	97	84	99	62	87	48	99
TOTAL	**11 783 408**	**12 404 188**	**83**	**87**	**61**	**62**	**64**	**67**	**72**	**75**

- Vaccine not in use
* OPV Coverage is for two doses
Source: PAHO

--- No data available
** Total coverage does not include North America

The *EPI Newsletter* is published every two months, in English and Spanish, by the Expanded Program on Immunization (EPI) of the Pan American Health Organization (PAHO), R egional 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.

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