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PAN AMERICAN HEALTH ORGANIZATION
Pan American Sanitary Bureau, Regional Office of the
WORLD HEALTH ORGANIZATION

525 TWENTY-THIRD STREET, N.W., WASHINGTON, D.C. 20037-2895, U.S.A.

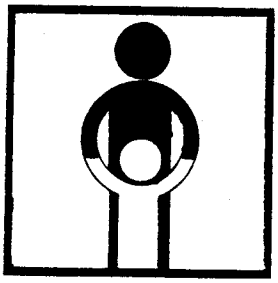
1992-000 15B

Tenth Technical Advisory Group (TAG) Meeting

on Vaccine-Preventable Diseases

Final Report

Rio de Janeiro, Brazil
16-19 March 1992



Expanded Program on Immunization
Maternal and Child Health Program

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I. INTRODUCTION

The Tenth Meeting of the PAHO Technical Advisory Group (TAG) on Vaccine-Preventable Diseases took place in Rio de Janeiro, Brazil, from 16 to 19 March, 1992. Participants were welcomed by Dr. Carlyle Guerra de Macedo, the PAHO Director. The meeting was officially opened by Dr. Joao Carlos Pinto Dias, President of the National Health Foundation of the Ministry of Health of Brazil. TAG members present were Drs. D.A. Henderson (Chairman of TAG), Alan Hinman (Rapporteur), Hilda Alcala, Joao Batista Risi, Peter Figueroa, and Jose Manuel Borgoño. Dr. Ciro de Quadros served as Secretary. Representatives of USAID, UNICEF, IDB, Rotary International, and the Task Force for Child Survival, agencies that are collaborating with countries in this program, were also present at the meeting.

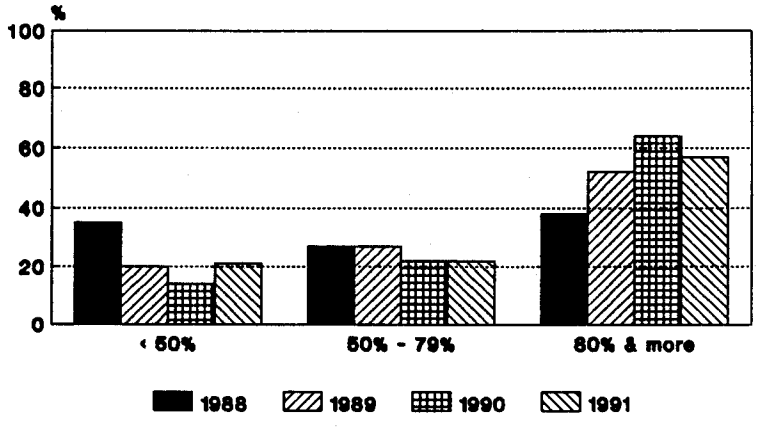
The World Health Organization was represented by staff members from the Headquarters in Geneva. A representative of England was also in attendance as were a number of members of the International Certification Commission on Poliomyelitis Eradication (ICCPE): Drs. Isao Arita, Dorothy Horstmann, Fernando Olinto, Frederick Robbins (Chairman of ICCPE), and Jan Kostrewski. The ICCPE had a special meeting on March 19 to discuss the findings of the TAG and to provide recommendations for the certification process.

II. CONCLUSIONS AND RECOMMENDATIONS

Significant progress had been documented at each of the previous TAG meetings, and the information presented at this year's meeting marked yet a higher level of achievement. Immunization levels have continued to climb and vaccination coverage levels continue to be monitored at the county level (**Figure 1**); vaccine coverage is now greater than 75% for all vaccines (**Table 1**); surveillance indicators improved in most countries; and the incidence of all the vaccine-preventable diseases continues to decline (**Table 2**).

Figure 1.

DISTRIBUTION OF DISTRICTS BY RANGE OF OPV3 COVERAGE IN CHILDREN < 1 YEAR LATIN AMERICA, 1988 - 1991



Number of reporting districts:1988-5791; 1989 - 9691; 1990 - 8731; 1991 - 6624
Source: PAHO (First semester 1991 data)

Table 1.
Vaccination Coverage in the Region of the Americas
in Children Under One Year of Age
1990-1991

SUBREGION/COUNTRY	CHILDREN UNDER 1 YEAR OF AGE 1990	1991	DPT 1990	1991	OPV 1990	1991	MEASLES 1990	1991	BCG 1990	1991
ANDEAN REGION	2,363,278	2,413,690	71	71	76	77	67	68	82	83
BOLIVIA	221,956	218,874	41	58	50	67	53	73	48	67
COLOMBIA	685,108	770,593	87	87	93	94	82	82	95	93
ECUADOR	320,852	327,138	68	59	67	62	61	54	88	83
PERU	600,904	603,700	72	71	73	74	64	59	82	78
VENEZUELA	534,458	493,533	63	60	72	71	62	61	73	79
BRAZIL	3,932,546	4,020,070	65	80	95	96	78	83	79	75
CENTRAL AMERICA	1,016,133	1,022,522	75	73	81	76	79	63	71	68
BELIZE	6,734	7,125	90	82	85	82	85	76	86	79
COSTA RICA	82,500	80,296	95	90	95	89	90	96	92	81
EL SALVADOR	186,266	190,636	77	60	77	60	76	53	60	66
GUATEMALA	349,847	346,092	66	63	74	69	68	49	62	43
HONDURAS	180,721	184,450	84	94	87	93	90	86	72	100
NICARAGUA	148,085	151,095	66	71	87	83	82	54	84	75
PANAMA	61,980	62,625	85	82	84	82	98	80	100	87
ENGLISH CARIBBEAN	132,747	132,579	87	85	87	84	76	83	95	93
ANGUILLA	200	154	100	100	100	100	100	100	100	100
ANTIGUA	1,114	1,262	100	94	100	97	89	87	100	-
BAHAMAS	5,641	6,000	86	92	82	91	91	93	87	-
BARBADOS	4,040	4,310	91	82	90	84	87	92	95	-
CAYMAN ISLANDS	434	434	95	97	95	96	82	90	90	81
DOMINICA	1,715	1,619	92	98	94	94	88	98	99	99
GRENADA	2,650	2,585	80	85	69	82	85	96	-	-
GUYANA	18,500	17,000	83	81	79	81	73	76	85	89
JAMAICA	59,104	59,606	86	85	87	86	74	77	98	94
MONTSERRAT	154	173	100	100	100	100	100	100	100	100
ST. KITTS & NEVIS	980	976	100	100	100	100	100	100	-	-
ST. LUCIA	3,652	3,652	91	96	90	95	82	97	97	-
ST. VINCENT	2,505	2,457	98	99	92	99	96	100	100	100
SURINAME	9,000	9,000	83	75	81	72	65	84	-	-
TRINIDAD & TOB.	20,980	20,980	83	82	87	81	71	93	-	-
TURKS & CAICOS	300	290	97	100	90	100	81	100	100	100
BRITISH VIR. ISL	238	350	100	98	100	95	100	84	100	90
LATIN CARIBBEAN	616,556	400,601	67	70	74	79	73	83	62	68
CUBA	186,654	173,896	92	100	94	97	94	100	98	98
DOMINICAN REPUB.	222,265	226,705	69	47	90	64	96	69	23	44
HAITI	207,637	-	41	-	40	-	31	-	72	-
MEXICO	1,600,550	1,933,394	66	63	96	95	78	-	70	87
NORTH AMERICA	4,217,083	4,217,083	62	82	62	82	63	84	-	-
BERMUDA	883	883	62	82	62	82	63	84	-	-
CANADA	371,200	371,200	-	-	-	-	-	-	-	-
USA	3,845,000	3,845,000	-	-	-	-	-	-	-	-
SOUTHERN CONE	1,184,445	1,181,817	88	85	89	88	90	95	97	97
ARGENTINA	686,289	676,061	87	84	90	88	93	100	100	100
CHILE	303,340	308,019	95	91	95	91	93	93	94	90
PARAGUAY	138,802	141,723	79	79	76	79	70	73	90	93
URUGUAY	56,014	56,014	88	-	88	-	82	-	99	-
TOTAL	15,063,338	15,321,756	71	75	89	88	78	78	79	80

- NO DATA AVAILABLE

SOURCE: COUNTRY REPORTS TO P.A.H.O.

Table 2.
Incidence of Selected Diseases, Region of the Americas, 1990-1991

REGION & COUNTRY	MEASLES		NEONATAL TETANUS		DIPTHERIA		PERTUSSIS	
	1990	1991	1990	1991	1990	1991	1990	1991
ANDEAN REGION	31,362	26,683	449	394	67	14	5,037	2,225
BOLIVIA	751	2,012	42	48	4	2	155	56
COLOMBIA	17,520	7,401	166	141	16	6	1,872	685
ECUADOR	1,673	2,024	88	80	3	3	487	520
PERU	1,437	1,401	125	89	44	3	1,134	187
VENEZUELA	9,981	13,845	28	36	0	0	1,389	777
BRASIL	61,435	32,335	250	223	840	558	14,057	5,858
CENTRAL AMERICA	38,564	12,721	134	70	12	0	839	541
BELIZE	70	7	0	0	0	0	3	4
COSTA RICA	75	6,340	0	0	0	0	75	19
EL SALVADOR	1,124	751	25	20	0	0	212	92
GUATEMALA	8,819	206	50	15	12	0	138	138
HONDURAS	8,360	95	39	18	0	0	147	89
NICARAGUA	18,225	2,867	15	11	0	0	242	96
PANAMA	1,891	2,455	5	6	0	0	22	103
ENGLISH CARIBBEAN	4,521	461	0	0	0	2	14	24
ANGUILLA	15	5	0	0	0	0	0	0
ANTIGUA	0	0	0	0	0	0	0	0
BAHAMAS	65	0	0	0	0	0	0	0
BARBADOS	51	0	0	0	0	0	3	0
CAYMAN ISLANDS	0	0	0	0	0	0	0	0
DOMINICA	13	6	0	0	0	0	0	0
GRENADA	5	2	0	0	0	0	0	0
GUYANA	1	12	0	0	0	0	1	0
JAMAICA	3,651	278	0	0	0	1	3	20
MONTSERRAT	0	0	0	0	0	0	0	0
ST. KITTS & NEVIS	80	5	0	0	0	0	0	0
ST. LUCIA	30	8	0	0	0	0	7	0
ST. VINCENT	1	2	0	0	0	0	0	0
SURINAME	35	10	0	0	0	0	0	0
TRINIDAD & TOB.	550	118	0	0	0	1	0	0
TURKS & CAICOS	2	8	0	0	0	0	0	4
BRITISH VIR. ISL	1	4	0	0	0	0	0	0
LATIN CARIBBEAN	4,908	7,531	155	4	27	11	1,163	10
CUBA	17	19	0	0	0	0	23	0
DOMINICAN REPUB.	3,477	7,512	12	4	27	11	227	10
HAITI	1,414	-	143	-	0	-	913	-
MEXICO	68,782	2,997	145	152	0	1	1,078	127
NORTH AMERICA	28,399	15,280	0	0	12	4	10,454	4,330
BERMUDA	1	2	0	0	0	0	0	0
CANADA	726	5,817	0	0	8	2	6,266	1,808
USA	27,672	9,461	0	0	4	2	4,188	2,522
SOUTHERN CONE	3,246	21,412	53	47	51	27	2,278	1,343
ARGENTINA	255	17,806	14	12	4	2	1,974	1,132
CHILE	1,846	2,080	0	2	37	21	63	58
PARAGUAY	1,035	471	39	33	10	4	80	112
URUGUAY	110	1,055	0	0	0	0	161	41
TOTAL	241,217	119,420	1,186	890	1,009	617	34,920	14,458

- NO DATA AVAILABLE

SOURCE: COUNTRY REPORTS TO P.A.H.O.

Available data suggest that poliovirus transmission in the Region of the Americas may have been interrupted or is, at the very least, rapidly approaching that point. Despite investigation of more than 4 000 stool specimens in 1991, wild poliovirus transmission was documented in only two countries. Only nine cases were confirmed in 1991: eight in Colombia and one in Peru (**Figure 2**). The last confirmed case had onset more than six months ago in Junin, Peru (August 1991). More than five years have elapsed since the last wild poliovirus was isolated in the countries of the Southern Cone; more than ten years since an indigenous case was detected in the United States or Canada; more than nine years since an isolate was reported from the English-speaking Caribbean; more than 30 years from Cuba, more than four years since the last isolation of indigenous wild poliovirus in Central America (three isolates in 1990 are thought to have been imported from Mexico); three years in Brazil; and more than a year in Mexico.

Figure 2.

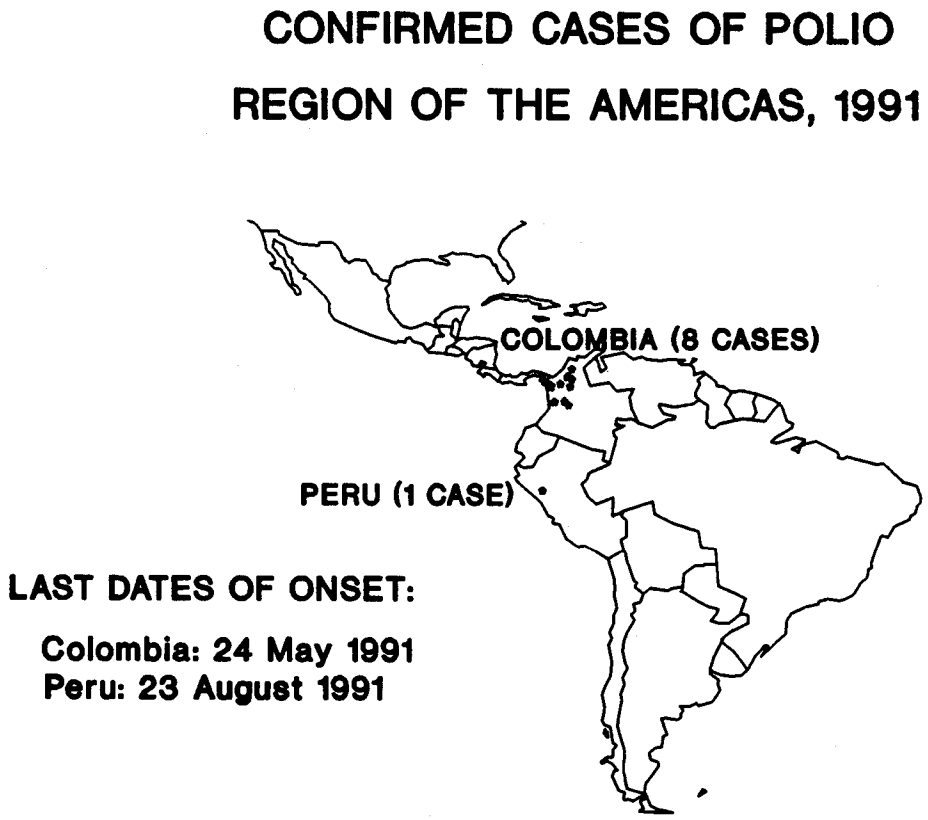


Table 3.

Classification of Cases of Acute Flaccid Paralysis Reported in 1991

COUNTRY	NUMBER OF CASES				
	Reported	Confirmed	Compatible	Probable*	Discarded
Argentina	92	0	8	10	74
Bolivia	66	0	1	0	65
Brazil	1 004	0	11	2	991
CAREC	17	0	0	0	17
Chile	104	0	0	12	92
Colombia	183	8	14	2	159
Costa Rica	5	0	0	0	5
Cuba	12	0	0	0	12
Dominican Republic	16	0	0	0	16
Ecuador	60	0	1	0	59
El Salvador	84	0	0	2	82
Guatemala	86	0	2	0	84
Haiti	16	0	0	11	5
Honduras	35	0	0	0	35
Mexico	433	0	1	8	424
Nicaragua	24	0	1	0	23
Panama	8	0	0	0	8
Paraguay	23	0	0	0	23
Peru	98	1	2	0	95
Uruguay	5	0	0	0	5
Venezuela	104	0	3	2	99
TOTAL	2 475	9	44	49	2 373

*Still under investigation/final diagnosis not yet available Source: PESS/PAHO

The TAG acknowledged that this tremendous progress would not have been possible without the high level of commitment accorded to immunization programs of all countries of the Americas, by PAHO, and by collaborating national and international organizations such as UNICEF, USAID, Rotary International, IDB, and CPHA. These efforts have also been dependent upon the high level of coordination achieved between all governments and the agencies supporting the program (USAID, UNICEF, ROTARY, IDB, CPHA, and PAHO). National Immunization Days and Mop-up Operations (**Table 4**) to complement routine immunization services require a large measure of

political and social commitment, but they have been primarily responsible for interrupting wild poliovirus transmission in the Americas. As the EPI embarks on special programs for neonatal tetanus and measles, it will, now more than ever, rely on the continued support of its contributors. Their support will be essential to continue progress toward higher levels of achievement and to insure that what has been gained, particularly polio eradication and the reinforcement of national health infrastructures, is not jeopardized or lost.

Table 4.
Summary of Mop-up Operations
Latin America, 1991 (provisional data)

Country	Number of Targeted Counties	Total Population < 5 years to cover	Total Number of Households Visited	Total Population < 5 Years Vaccinated	%	Total Population Vaccinated
BOLIVIA	25	342 516	76 625	58 991	17	65 496
BRAZIL	N/A	N/A	N/A	N/A	-	N/A
COLOMBIA	409	2 212 886	2 003 407	1 824 899	82	1 824 899
ECUADOR	99	854 985	827 127	670 854	78	699 384
EL SALVADOR	164	705 801	358 525	316 258	44	431 283
GUATEMALA	342	1 424 532	811 964	1 064 864	74	1 064 864
HONDURAS	122	582 320	468 600	527 168	90	527 168
NICARAGUA	116	249 978	170 207	121 577	48	121 577
MEXICO	61	N/A	N/A	509 474	-	509 474
PERU	98	1 239 466	1 058 949	1 070 951	86	1 483 280
VENEZUELA	47	231 332	204 895	194 295	83	256 538
TOTAL	1 483	7 843 816	5 980 299	6 359 331	74	6 983 963

N/A: No data available

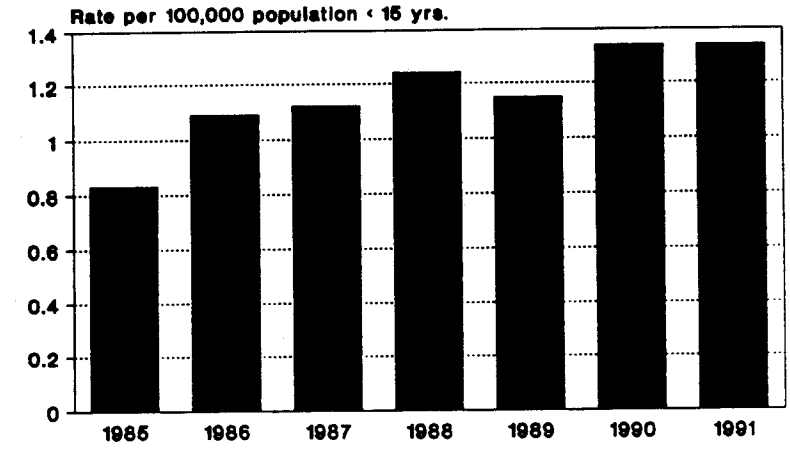
The TAG also recognized that significant contributions have been made by the social mobilization efforts undertaken in support of immunization programs. However, more resources are required for all aspects of social mobilization, especially mass media communications, in order to inform and educate the population about the importance of immunization in avoiding needless death and disability. It is especially important for disadvantaged populations, which are always the most difficult to reach and yet need to be informed about immunization in general, specific vaccines, appropriate ages for each vaccine, number of doses, etc. Past efforts using mass media and well-known actors or personalities have had positive effects on coverage rates in national and regional campaigns. This was exemplified in the Andean Region during Andean Immunization Day, and in the Caribbean Region during Measles Elimination Month.

The TAG was pleased with the continued improvement of the surveillance performance indicators which is reflected in the rate of cases of acute flaccid paralysis (AFP) reported throughout

the Region (**Figure 3**). Furthermore, there are at present nearly 20,000 health units that report weekly on the presence or absence of cases of AFP (**Figure 4**).

Figure 3.

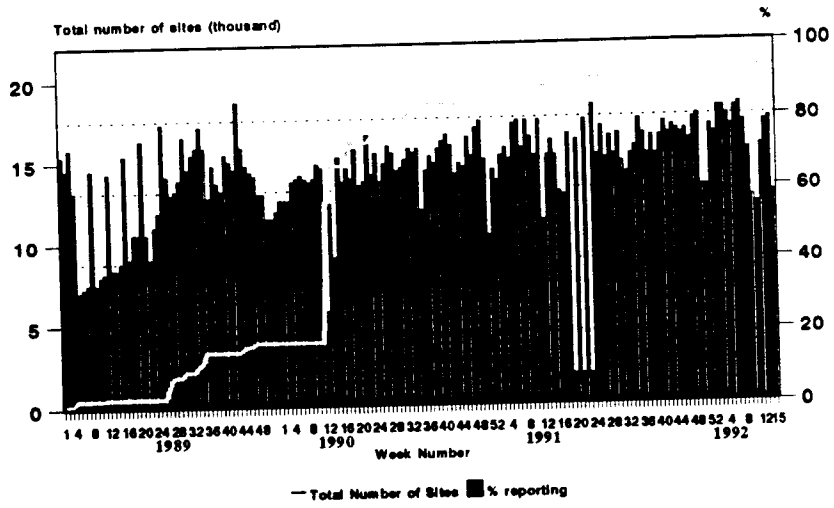
RATE OF ACUTE FLACCID PARALYSIS AMONG CHILDREN UNDER 15 YEARS OF AGE LATIN AMERICA, 1988 - 1991



Source: PAHO

Figure 4.

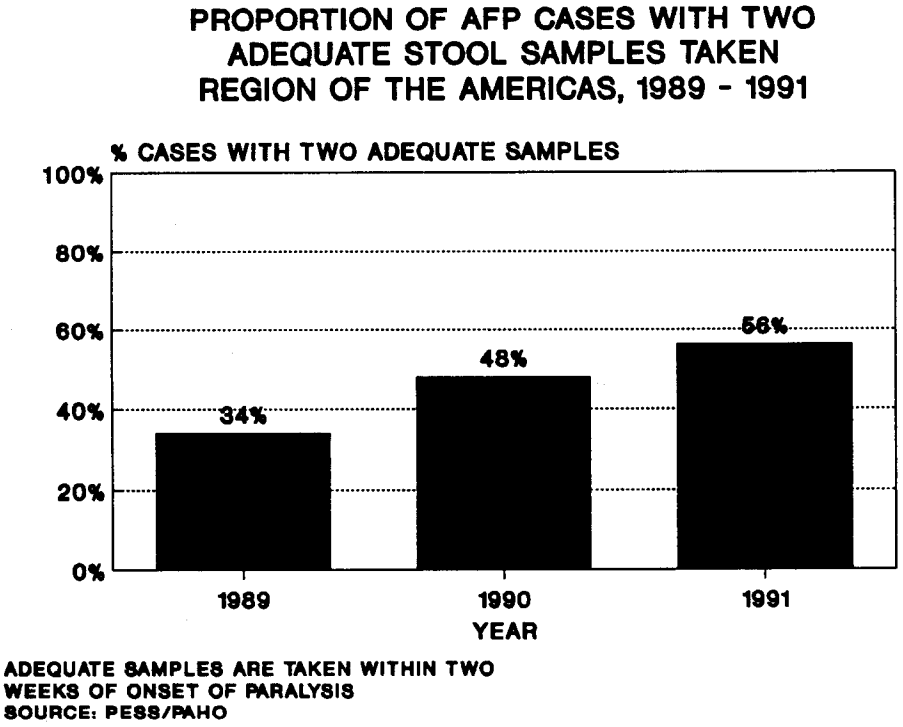
NEGATIVE REPORTING OF AFP LATIN AMERICA, 1989-1992*



* for 1992 data up to week 15
Source: PAHO

The principal deficit now is in assuring the proper collection of two adequate stool specimens within 15 days of onset of paralysis from every case of AFP (**Figure 5**) and from contacts. Without this information, a case remains classified as "compatible" and uncertainty remains as to whether poliovirus transmission has been stopped. During the coming months, highest priority must be given to the detection and thorough investigation of all cases of acute flaccid paralysis, especially those which are compatible with polio and particularly those with acute febrile onset in children less than six years old.

Figure 5.

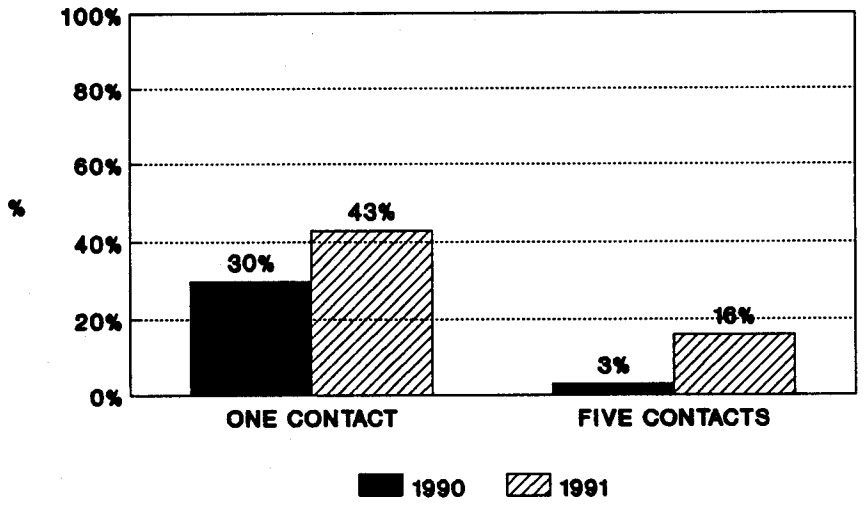


The confirmation of cases through investigation of contacts should not be neglected, and should supplement, never replace, the emphasis on adequate and timely stool collection from every case of acute flaccid paralysis (**Figure 6**). Between 1989-1991, 12% of all confirmed cases were identified by isolation of wild poliovirus from stools of contacts at a time when the stools of the index cases were negative. Despite the importance of contact investigations and specimens, only 43% of all cases of reported acute flaccid paralysis in 1991 had contact investigations and only 16% had five or more contacts. Once laboratory investigations of contact stools are initiated, the work must

continue until a final result is obtained. Of special concern are those polioviruses from stools of contacts which are still pending characterization even though some are classified as compatible polio cases.

Figure 6

PROPORTION AFP CASES WITH STOOL SAMPLES FROM AT LEAST ONE AND FIVE CONTACTS LATIN AMERICA, 1990 - 1991



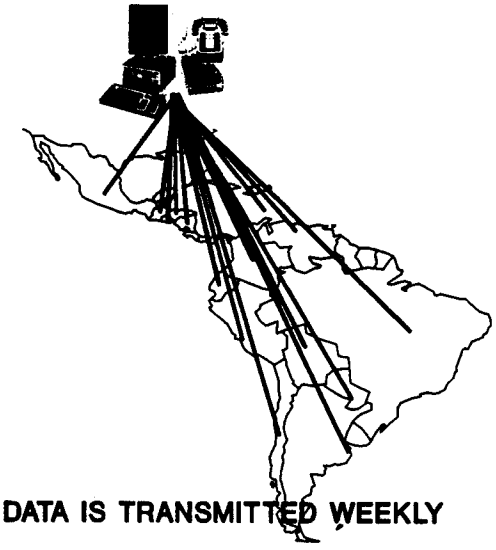
Source: PAHO

The TAG noted, in particular, that with the eradication of indigenous wild poliovirus appearing imminent, renewed emphasis needs to placed on maintaining and improving the quality of surveillance and the documentation of activities to spear-head the program into the "Certification Era."

Because the PAHO Polio Eradication Surveillance System (PESS) will serve as the most important instrument for data analysis during the certification process, special efforts should be made ensure that all necessary epidemiological, clinical and laboratory data are entered into PESS (**Figure 7**).

Figure 7

COUNTRIES OF THE REGION OF THE AMERICAS WITH PESS INSTALLED



• POLIO DATA IS TRANSMITTED WEEKLY

The methodologies for sampling stools in communities and testing sewage appear promising and such work should be expanded into other countries using a targeted risk approach. In areas, particularly rural areas, where conditions do not allow sampling and testing of sewage, community stool surveys of children will need to be taken. Because of the limited capacity of the laboratory network, these surveys will need to be carefully planned and coordinated on a Regional basis to assure that they are performed in the most appropriate areas.

The intense efforts made in Colombia and Peru to eliminate transmission of wild poliovirus appear to be progressing well, but special alert measures will be required for the balance of the year. These extraordinary efforts have demonstrated once again the high level of commitment that the immunization program places on the integration of primary health care services. Last year, the Region of the Americas was confronted with the largest cholera epidemic reported this century. Over 400 000 cases of cholera have been reported since the start of the epidemic in Peru in January 1991, and its spread to Ecuador, Colombia, and other countries. In both Colombia and Peru, mop-up campaigns to eradicate polio (called "sanitary mop-ups") incorporated cholera prevention activities, including the distribution of health education materials, to prevent further spread. Other countries not reporting confirmed polio cases will direct special attention to cholera prevention, especially during house-to-house mop-up campaigns.

SPECIFIC RECOMMENDATIONS

A. POLIOMYELITIS ERADICATION:

1. Vaccination, Vaccines and The Cold Chain

- It will be critical to maintain high vaccination coverage uniformly with OPV in order to assure that pockets of susceptibles are reduced to a minimum and to prevent dissemination of wild poliovirus in the event of an importation.

- Oral polio vaccine (OPV) remains the vaccine of choice for the eradication program in the Americas as it is for eradication programs in other parts of the world. Inactivated polio vaccine (IPV) does not induce intestinal immunity of a degree that stops further spread of the virus and is not recommended for national use in the Americas.

- The quality control of vaccines continues to be of vital importance. As has been recommended in previous TAGs, all countries producing vaccines should have batches of their vaccines tested regularly by the PAHO/WHO reference laboratories.

- Special efforts continue to be needed to improve and maintain the quality of the cold chain, both for vaccines and for transportation of stool specimens. Management and follow-up of the cold chain indicators need added emphasis, particularly in the Andean countries where the most recent transmissions occurred.

2. Specimens

- The laboratory network is functioning smoothly. Nonetheless, efforts should be made to minimize the turnaround time for reporting results, including molecular characterization.

- Specimen collection from both cases of acute flaccid paralysis and their contacts remains the best way to rule out wild poliovirus transmission. Every case of acute flaccid paralysis needs to have two adequate stool samples collected within 15 days of onset of paralysis, and specimens from at least five contacts under the age of five. Because it is impossible to determine whether a patient will be available for follow-up, stool collection must take place during the first encounter with the patient.

- The decision to test stools of contacts demands precise communication and coordination between the epidemiologists and the virologists. All available specimens from cases and contacts of every compatible case should be examined. To ensure that there are no delays in the investigation of contacts, the epidemiologist should have weekly contact with the virologist to discuss problems or issues raised by PAHO's Weekly Polio Bulletin and the investigation or follow-up of cases of acute flaccid paralysis and their contacts.

- Inadequate collection of stool specimens accounts for the large number of compatible cases reported during the last two years: 71 cases in 1990, and 33 in 1991. The occurrence of compatible cases, particularly in children who are less than six years of age and had fever at onset of paralysis demands the highest priority in attention. Just one such case, inadequately investigated, could set back the date of eligibility for certification.

3. Reporting and Maintenance of Data

- The collection and evaluation of the appropriate clinical information is critical for justifying the "discarding" of cases. The TAG recognizes that a single, standardized information system, available at the national and regional levels of the program, will be critical for ensuring that the eradication of polio has been achieved and for facilitating the certification process. Accordingly, the TAG recommends that only data available in PESS be used in the certification process. This will require countries to place added emphasis on thorough collection of clinical information from cases of acute flaccid paralysis and that these data be entered into PESS.

4. Community Surveillance of Wild Poliovirus

- The results of pilot studies conducted last year during the Cartagena, Colombia outbreak, where wild-type 1 poliovirus was isolated from both the stools of surveyed children and from sewage, demonstrate the usefulness of environmental surveillance of wild poliovirus. The TAG recommends that such studies be continued using a targeted risk approach. As pointed out, such surveys need to be regionally planned and coordinated to assure that laboratory capacity is not exceeded.

5. Certification Planning

The ICCPE considered issues relating to the certification of eradication. It was agreed that a plan should be developed by PAHO which would outline the steps necessary for a country (or region) to prepare for certification. It is anticipated that this plan will be presented to the ICCPE for discussion and approval by October 1992, and subsequently be distributed to member countries.

Although specific details remain to be worked out, the certification process will focus on gathering evidence from three major areas: immunization coverage, surveillance of illness, and surveillance of poliovirus. Formal certification will not occur until at least three years have passed since the onset of the last case of paralysis caused by wild poliovirus anywhere in the hemisphere. Provisional certification may be granted to sub-regions of the Americas before hemispheric eradication is certified. Countries in which no cases have been reported in recent years may wish to consider establishing national commissions to aid in the review process.

Issues to be addressed during the review process will include maintenance of immunization levels in each district; distribution and functioning of surveillance sites; frequency of notification (including negative reporting); surveillance indicators (including

rapidity of investigations, adequate collection of stool specimens from the patient and contacts; results of laboratory studies on these specimens; and results of community sampling (both sewage sampling and stool surveys).

6. Research

- With the advent of environmental surveillance, the laboratory network will be confronted with a dramatic increase in the number of stool specimens collected from sewage and surveys of children. Pooling of specimens will be necessary for the labs to handle this increased work-load. Studies should be done to determine optimal methods. Special antibody capture techniques as used for hepatitis A, cefadex columns, and organic compounds such as freon may be appropriate and should be evaluated. Once PCR technology has been transferred, these concerns will lessen.

- Sewage collection methodologies should continue to be evaluated. Presently, the simple gauze pad collection method appears most promising.

- The TAG encourages studies that may lead to reliable, direct application of polymerase chain reaction to raw sewage samples, thereby minimizing the need for virus culture and the delayed reporting of results.

7. Global Program

The TAG calls on other WHO Regions to intensify their efforts toward polio eradication to protect their own populations and reduce the risk of importation of wild poliovirus into the Americas.

B. MEASLES

Overall incidence of measles in the Americas continues to diminish and the patterns of outbreaks show a tendency toward longer interepidemic intervals. In order to get a better picture of the changes in measles epidemiology and adjust control activities, high priority should be given to obtaining minimal surveillance information (age, date of onset, vaccination status, date of vaccination) for all measles cases, particularly during outbreaks.

The recent measles elimination initiative in the English-speaking Caribbean appears to have been successful in interrupting measles transmission in some countries which followed the month-long, mass vaccination strategy. Experience gained from this initiative, and from others to come should be used to learn about the process and solve the problems unique to measles elimination; to reinforce measles vaccination and control efforts; to strengthen the surveillance systems; and to address issues of sustainability.

The Director of PAHO recently convened a group to review the measles initiatives currently underway and those being planned by several other countries. The group met in Washington, D.C. on 28 February 1992. The TAG endorses the conclusions and recommendations of that meeting:

1. The Group recognized that PAHO has historically played a lead role in the control of vaccine preventable diseases. The Region of the Americas was the first continent to become free of Smallpox; it developed several strategies that led to greatly improved immunization programs, such as the institution of a revolving fund for vaccine purchase. It was also the first Region to prioritize the development of surveillance within national immunization programs. It was also the first Region to decide on poliomyelitis eradication and the strategies now being applied globally were developed in the Region of the Americas. In this context, PAHO's efforts to enhance measles control, possibly leading to global eradication, would be yet another 'first'.

2. The Group emphasized the fact that of all known microorganisms, the measles virus is the most serious, resulting in more deaths than any other. Measles vaccination programs thus command the highest priority. Measles causes a substantial health burden in both developed and developing countries. Not surprisingly, data from recent studies of the cost effectiveness of health interventions (unpublished IBRD list) shows measles vaccination to be the most cost effective medical procedure in terms of adding discounted healthy life years (DHLY). It was shown to be more effective than interventions such as neonatal care, vaccination against other vaccine preventable diseases, and other child health interventions such as ORS therapy and ARI antibiotic therapy.

3. Given the fact that man is the only host for the measles virus, that the illness is short-term and followed by permanent immunity and that a highly protective (over 90% efficacious) vaccine is available, the Group agreed that interruption of measles transmission is theoretically possible and has been achieved in some areas for limited periods. However, this has never been done over a wide geographical area. Thus, there is utility in determining the feasibility of achieving this objective in selected areas and countries.

Such initiatives would help to address several important questions such as:

a. What are the best approaches for measles surveillance, in terms of clinical case definition, reporting sources, follow-up and laboratory diagnosis utilizing a single blood specimen;

b. What levels of immunity are necessary to achieve interruption of transmission in different urban and rural environments;

c. What is the best vaccine and vaccination schedule and vaccine delivery strategy to stop transmission (mass campaigns, routine immunization, combined approach), vis-a-vis the changing epidemiology of the disease;

d. Due to the highly contagious nature of the disease, how can a "transmission free" status be sustained once the disease is reintroduced into a given population and what is the best strategy to control outbreaks;

e. What are the management constraints, both financial as well as operational, including issues that deal with vaccine supply.

4. The Group considers that these efforts to enhance the control of measles with actions that are designed to lead towards its elimination should be supported by PAHO. It therefore recommends that PAHO give support to the initiatives already under way in Cuba and the English-speaking Caribbean and those already planned in Brazil, Chile and the Central American countries, as they represent valuable steps towards assessing the feasibility of elimination of measles throughout the Western Hemisphere.

5. These initiatives should be pursued within the context of the overall PAHO policies of strengthening the health infrastructure and decentralizing services. The impact on measles morbidity and mortality should serve as a surrogate to the performance of the immunization program as a whole.

6. As lessons are learned and barriers are further identified and removed, PAHO should continuously reassess the feasibility and timing of an elimination goal for the Western Hemisphere.

C. NEONATAL TETANUS

In 1991, there were 898 reported cases of neonatal tetanus, of which 780 (87%) were investigated. This marks a great improvement over 1990 when only 446 (35%) of the total cases were investigated. Of the 780 cases reported in 1991, vaccine history was obtained from 311 mothers. Only 19 had received two or more doses of tetanus toxoid. However, the data show that the majority of the countries are following the recommendations of the previous TAG meeting.

Because of their excellent sanitation conditions, high percentage of hospital births, and low proportion of women of childbearing age in high risk areas, Venezuela and Panama were challenged to vaccinate 100% of the women of childbearing age in high risk areas before the next TAG meeting in 1993. Argentina will accelerate its program to reach the target population before 1995.

To reach the elimination target for the Region, it will be necessary to vaccinate approximately 20 million women of childbearing age (22% of the women in endemic countries) who live in 1 140 counties (10% of the total counties in endemic countries). This will require additional activities at an estimated cost of US$ 34 million.

The TAG recommends the following:

1. Continued adherence to previous TAG recommendations.

   a) Separate reporting of neonatal and postnatal tetanus.
   b) Investigation of each case of NNT and implementation of active searches.
   c) Giving high priority to vaccination activities targeted at reaching women of childbearing age in high risk areas.
   d) Involvement of traditional birth attendants in surveillance and control activities.

2. Improvements in the quality of the data collection system for neonatal patients that attend health services in high risk areas to make them useful in the control and investigation of individual cases of neonatal tetanus.

3. All endemic countries should report coverage rates specifically for women of childbearing age.

D. PERTUSSIS

In most of the Region of the Americas, the data is inadequate for assessing any changes in pertussis epidemiology resulting from increases in DPT coverage. Efforts should be carried out to collect better epidemiological data on the morbidity and mortality of pertussis. Studies should be developed to devise the best case definition for use in controlling the disease.

E. ADVERSE EVENTS

Various countries in the Americas have developed systems to monitor adverse events to vaccination. In order to assist other countries in developing such systems, efforts should be made to disseminate information and exchange experiences on adverse events and their reporting systems.

F. HEPATITIS B

The recommendations made at the Ninth TAG meeting are reaffirmed. Hepatitis B vaccination programs should be initiated and continued in areas of high prevalence and among groups at high risk, with wider use depending on the epidemiological situation and the availability of resources.

1. Vaccination of infants is best accomplished by integrating hepatitis B vaccine into national immunization programs, with catch-up programs for older children as needed. Vaccination of specific high risk groups, such as health care workers, should be continued.

2. Attempts should be made to include hepatitis B vaccine in the revolving fund for vaccine purchases, so that it can be provided to participating countries at an affordable price.

3. Cost data for various countries should be obtained so that cost-benefit models can be applied to evaluate policies for routine infant immunization with hepatitis B vaccine.

4. Other efforts to reduce rates of hepatitis B virus transmission should be encouraged and continued, including education efforts to reduce risk behaviors, hepatitis B screening in blood donation centers, and promotion of safe injection practices.

G. RUBELLA IMMUNIZATION STRATEGIES

Although much is known about the impact of rubella and congenital rubella syndrome (CRS) in some countries, the data is incomplete in most. The selection of appropriate rubella control strategies depends on knowledge of the epidemiology of rubella, the incidence of rubella infection in pregnancy and CRS, and the health impact of these.

There are three possible strategies for rubella control; namely, routine infant immunization, selective immunization targeted at specific groups, and a combination of both of these. A strategy aiming to interrupt transmission of rubella through mass infant immunization using rubella vaccine administered simultaneously with measles vaccine, has potential risks. If coverage is not sufficient to interrupt transmission but merely shifts the age specific infection rate to older groups, then more cases of CRS could occur than would have occurred without immunization. Selective immunization of prepubescent girls and susceptible adult women does not bear this risk. However, this strategy may be difficult to implement because such groups are not readily accessible and these large-scale programs are often inefficient because many of those immunized are already immune through natural infection.

The ideal strategy is the achievement of high coverage with rubella vaccine administered with measles vaccine combined with selective immunization to ensure that no woman enters the child-bearing years without being protected against rubella. Unless all these conditions can be assured, including the resources required to support the program in the long term, the vaccination strategy should target post-pubescent females to the extent that resources are available.

New surveillance systems, able to detect cases of CRS, rubella infections during pregnancy, and rubella susceptibility according to age and parity, need to be established. No reliance can be placed on clinical reporting of rubella.

H. CANDIDATE VACCINES FOR INCLUSION IN EPI

Haemophilus influenzae type B conjugate vaccines, now licensed for use in a number of countries, may prove to be sufficiently cost-effective to be recommended for addition to the vaccines now being used in the EPI. Such a decision awaits expanded studies of *Haemophilus* morbidity and vaccine efficacy in tropical countries, and identification of resources for the purchase of the vaccine.

I. VACCINE PRODUCTION AND QUALITY CONTROL

The recent Regional increase in the demand for vaccines, mainly due to intensified implementation of vaccination programs, has brought on problems related to maintaining the continuous supply needed by these programs. All around the globe, developing countries are responsible for the increased demand for vaccines. Consequently, the price of vaccines is likely to rise on the world market. Indications of this have been detected by the UNICEF vaccine bid and the PAHO Revolving Fund.

At the same time, the fantastic development of basic sciences and technologies related to biologicals has opened the prospect of making existing vaccines safer, more thermostable, more potent, and more effective, of creating new formulations and combinations of existing antigens and of developing entirely new vaccines. The Children's Vaccine Initiative launched by WHO, UNICEF, UNDP, the World Bank, and the Rockefeller Foundation at the time of the Children's Summit in September 1990, defined the ideal vaccine as one which is safe, effective, thermostable, preferably administered orally, and contains, in one dose, all the antigens required to fully protect a child against all preventable diseases.

In the Region of the Americas, there are several research institutions and several important groups of scientists involved in basic biological research. There are also institutions with long-standing traditions of development and production of biologicals which are playing an important role in providing the biologicals, including the vaccines for national immunization programs, and the therapeutic antisera (e.g., anti-rabies serum, antivenin), required by the Region. In addition to EPI vaccines, the Region is self-sufficient in rabies vaccine produced in newborn mice (either for human or canine use) and yellow fever vaccine.

To make it possible for the Region to participate more fully in the process of improving vaccines or developing new ones, PAHO has developed a proposal for a Regional Vaccine System (SIREVA), which encompasses all steps related to the development of vaccines (epidemiological surveillance, research, clinical and field trials, scale-up of production procedures, quality control and quality assurance). The SIREVA proposal would strengthen existing research groups and institutions in the Region and ultimately enable them to operate independently.

The SIREVA project has been discussed in several meetings and has been found to be economically, scientifically, and technologically feasible. Existing PAHO mechanisms would carry out the coordination activities essential for technical cooperation among the institutions and to facilitate related matters such as technology transfer.

There are already some important activities being carried out under the auspices of SIREVA, including oral cholera vaccine (WC/rBS) field trials in Colombia, Brazil, and Mexico; the strengthening of surveillance and laboratory activities in studies of the regional prevalence of *S. pneumoniae*; and improvement of production procedures through workshops on Good Manufacturing Procedures (GMP). In addition, the organization of a network of quality control and quality assurance laboratories is being discussed and workshops on quality control methodologies (organized jointly with WHO/Biologics) are underway.

The TAG recommends:

1. The coordinated effort of SIREVA should be supported in order to make it possible for the Region to participate fully in the development of new or improved vaccines.

2. Strong support should be developed to improve the production capabilities of existing vaccine production facilities in the Region.

3. Existing technical requirements, such as GMP, quality control and quality assurance should be enforced in all production facilities.

4. Technical cooperation among laboratories in the Region should be strengthened to enhance existing capabilities.

5. A system of vaccine quality surveillance should be enforced through a network of quality control laboratories in order to insure the quality of the vaccines.

J. INTER-AGENCY COORDINATION

The ICC Meeting of 12 December 1991 made the following recommendations which are endorsed by the TAG:

1. In each country, the ICC should meet regularly to review and plan with their national counterparts the implementation of activities listed in the Plan of Action.

2. The ICC should improve in each country its methodology for monitoring budget execution and disbursements (both by governments and collaborating agencies) and reflect any budgetary changes by updating the Plan of Action at regular intervals. To assist ICC, it is recommended that a simple monitoring form be used in conjunction with the budget planning regular format.

3. Resources flowing from the National Plans of Action should be targeted to the high risk areas, those with the lowest immunization coverage and continuing transmission or prevalence.

4. All countries should hold ICC meeting as soon as possible in order to finalize the activities and negotiate funds between all ICC agencies to the extent possible so that the governments can present the final draft of the 1992 Plan of Action as soon as possible so as to prevent a slow-down of activities.

5. Given the reduced availability of external funding, each country should invite other NGO's and the private sector to participate in the EPI in order to assure maximum national coverage of vaccination programs and coordinated actions and programming.

6. ICCs have been so successful for EPI in many countries, that the model for cooperation is being applied to other child survival programs, and indeed, sometimes to overall child survival planning and coordination efforts. This has raised concerns that in some cases the EPI ICC maybe converted into a general Child Survival ICC, thus reducing the time and attention devoted to EPI, to the detriment of the program.

The Regional ICC wishes to recommend that separate meetings continue to be held at the country level on the subject of EPI coordination and planning, in order to allow adequate time to accomplish these tasks. It may be necessary that this be done as a sub-group of the national child survival ICC, perhaps with operational level personnel rather than donor representatives and program directors. This could be especially important as the ICC is asked to take on a more active role in planning for and monitoring program financing as countries move towards more self-sufficiency in immunization programs. This model of sub-groups may also be useful for other topics such as diarrheal disease or acute respiratory infection control programs and other goals established by the Children's Summit.

III. SUMMARY OF PROGRESS

A. POLIOMYELITIS ERADICATION

1. Andean Region

The last nine polio cases confirmed in 1991 through the isolation of serotype 1 wild poliovirus, occurred in the Andean Region: eight in Colombia (where the last isolation date was 28 May 1991) and one in Peru (5 September 1991). In 1991, the were 21 compatible cases in the Andean Region.

Vaccination coverage of children under one for all biologicals continued to increase over the last five years, reaching over 65% in 1991. The high coverage rates reported by Colombia are noteworthy. A breakdown of the ranking of counties by OVP3 coverage in children under one in 1991 shows that 28% of the counties are still in the high-risk group (coverage under 50%), while 32% fall in the medium-risk category (50-79% coverage).

There are 2 972 reporting sites in the Andean Region, of which an average of 67% actually reported during 1991, covering 94% of the weeks in the year. An average of 70% of the centers in Bolivia, Ecuador and Venezuela reported in 1991, whereas the reporting rate in Colombia and Peru reached only 50%.

Despite an increase in the proportion of cases reported which had two stool samples taken within fifteen days of onset of the paralysis, the stools collected were adequate in only 57% of the cases. In Peru, over 80% of the cases had samples collected within 15 days of onset, in Bolivia and Ecuador over 60%, and in Colombia and Venezuela less than 40%.

The proportion of cases reported which had stool samples collected from at least five contacts increased considerably from 1990 to 1991, but 44% is still far below the desirable rate. Ecuador, Peru and Venezuela achieved compliance rates of over 60%, but the 1991 rates for Bolivia and Colombia were under 40%.

The efforts of the countries of the Andean Region are particularly noteworthy in some areas, namely the energetic responses of the governments of Peru and Colombia which, when faced with the latest confirmed cases, carried out Sanitary Mop-Ups across vast areas at risk; the intensification of the active case finding for acute acute flaccid paralysis in Bolivia, Ecuador and Peru, and the certification of weekly negative reporting in Venezuela.

2. Brazil

The last two confirmed cases were reported three years ago, in March 1989. Both cases were reported to be poliovirus type 1 and both came from states in the Northeastern Region of the country.

In 1990, 539 cases of acute flaccid paralysis (excluding cases of facial paralysis) were reported, with 14 compatible cases. In 1991, 585 cases (excluding 419 facial paralyses) were

reported with 11 compatible cases. The rate of acute flaccid paralysis was 0.9 and 1.0 per 100 000 children under 15 years in 1990 and 1991 respectively.

In 1991, 14 states had acute flaccid paralysis rates below one per 100 000, three of them being small (Acre, Tocantins, Roraima) in terms of total population. Several large states,like Bahia and Sao Paulo,which account for approximately for one third of the total population in Brazil have rates of one or more.

In 1991, 68% of the cases reported (including facial paralysis) had two adequate stool samples collected, in comparison to 58% in 1990. Seven states have more than 80% of cases with two adequate stool samples, compared to four states in 1990. The samples were received in good condition from 20 states (100%). Eighty percent of the cases were investigated within 48 hours reporting in 1991. In 1992 the surveillance system will not be reporting nor investigating cases of facial paralysis.

3. Caribbean

The English-speaking Caribbean continues to maintain high levels of coverage for OPV in children under one, 84% in 1991 for the whole area.

Active surveillance of acute flaccid paralysis was instituted as of week 39, 1991, with two hundred sites reporting routinely. By week 52, 1991, over 300 sites were reporting regularly. The overall rate for acute flaccid paralysis was 1.5 per 100 000 for 1991, a significant increase when compared with the 0.3 per 100 000 reported in 1990. Of concern is the fact that only 38% of the reported cases of acute flaccid paralysis had two or more adequate stool samples taken. Attempts should be made to improve this indicator in 1992.

4. Central America

With the exception of Honduras, vaccination coverage rates in the Central American Region decreased for all countries and all antigens in 1991, compared to 1990. It is strongly recommended that the countries redouble their efforts to achieve and maintain as high vaccination coverage levels as is possible.

As of 1990, when the last cases were confirmed in Guatemala, there have been no more confirmed cases of poliomyelitis in Central America. During 1991, all of the epidemiologic surveillance indicators for acute flaccid paralysis showed significant improvements over those reported at the last TAG meeting, reaching the highest levels reported in the American region. The acute flaccid paralysis rate has remained at over 1.5 per 100 000 children under 15 years of age since 1988, and in 1991 it was 1.8 per 100 000 among the same age group. In 1991, Nicaragua made significant strides to improve its reporting and increased the rate of reported acute flaccid paralysis to over 1.0 per 100 000 children under 15 years of age.

Over 80% of the cases were reported within fifteen days of the onset of paralysis and control measures were undertaken within 72 hours in 80% of those cases. Two adequate stool samples were collected for 71% of the reported cases. Furthermore, there was a

marked increase in the collection of stool samples from contacts. Seventy-six percent of cases were followed-up by collecting stool samples from at least one contact, and in 36% of reported probable polio cases, samples were collected from five or more contacts. All of the cases reported had follow-up visits, of which 76% took place within 70 days of the onset of paralysis.

The improvements in the indicators reflect the major efforts undertaken by Honduras, Guatemala and El Salvador. Nicaragua and Panama should continue to improve their surveillance indicators. Costa Rica did not show progress in its acute flaccid paralysis surveillance during 1991 and should immediately make the necessary adjustments in order to advance the certification process for eradication of poliomyelitis in the subregion.

When cholera was introduced into Central America during the second semester of 1991, there was excellent coordination among the immunization and diarrheal disease control programs. As a result, vaccination activities incorporated the dissemination of information regarding measures on how to prevent cholera. House-to-house visits were made in the high-risk counties of Guatemala, Honduras, Nicaragua and El Salvador.

5. Mexico

The last confirmed cases where wild type-3 poliovirus was isolated were from October 1990. The country has thus been free of the wild virus for 17 months. There was also a significant reduction in compatible cases, from eight in 1990, to one in 1991. During 1991, 433 cases of acute flaccid paralysis were reported, yielding a rate of 1.5 per 100 000 children under 15 years of age. Twenty-four percent of these cases were reported through active case-finding. This shows that the system of regional epidemiologists is efficient, but also reveals the weak points of the routine reporting system. Other program indicators that have to do with the timeliness of investigations and case follow-up (adequacy of stool samples and contact samples collected) improved considerably when compared to previous years. Mop-up operations were carried out in 66.4% of all cases of acute flaccid paralysis reported; a total of 486 228 vaccine doses--an average of 1 694 doses per case--were used.

The negative reporting network has 12 000 reporting sites, of which around 80% report weekly and in a timely fashion. The priority network is the sentinel system and is made up of all the second and third level health institutions, which total 470 sites which report weekly and on a timely fashion 90% of the time.

Vaccination coverage among children under one year of age reached satisfactory levels (OVP3=95%, DPT3=63%, BCG=87%). It is hoped that these levels will continue to improve and reach the goal of universal vaccination by October 1992. Approximately 10 million children under five were vaccinated in each of the two National Vaccination Days held in 1991.

For the first time, Mexico presented an analysis of coverage by county, a concept that was implemented to detect and monitor high-risk pockets. The data corresponding to 30.1% of the population under one year of age, show that 17.3% of these children are in counties

that have vaccination coverages under 50%; 31.3% in counties with 50% to 80% coverage, and 51.4% are in areas with coverage rates over 80%.

Concerning neonatal tetanus, an action plan was developed in 1991 and high-risk areas were identified to eliminate the disease by 1995. One hundred fifty-two cases were reported and followed up in 1991. As a first phase of the elimination plan, emphasis was placed on 13 counties in which repeated outbreaks had been reported. The TT2 coverage among women of childbearing age reached 67.6% in the high-risk areas, and 19.6% in the rest of the country.

In 1991, 2 997 cases of measles were reported. The epidemiologic control of measles was obtained by lowering the age at vaccination from one year to nine months for the first dose, with an additional dose upon entering school. Measures were begun to establish epidemiologic surveillance of febrile exanthematic illnesses, with the purpose of eliminating measles altogether from the national territory.

6. North America

Canada - After over 14 years with no wild indigenous poliomyelitis and four years since the last imported case, Canada is developing more efforts to maintain awareness of and vigilance for polio. In order to identify future possible virus circulation, environmental sampling will be used to help with the investigation of suspected cases and with surveillance of any imported cases which may be detected.

Two new initiatives were developed with the purpose of reinforcing surveillance. First, a retrospective review of all cases of Guillain-Barré Syndrome (GBS), using two large hospital databases covering 100% of all hospitalizations in Ontario and Quebec that account for 60% of the Canadian population. From 1983 through 1989, a total of 2 333 admissions due to GBS were identified for a mean annual incidence of 2.0 and 2.3 per 100 000 for Ontario and Quebec respectively. For children less than 15 years of age the rate was around one per 100 000. Second, after a pilot phase, a children's hospital-based active surveillance system that will monitor flaccid paralysis, is being put into place in all pediatric hospitals covering nearly the totality of tertiary case admissions.

United States of America - The discussions focused on three areas relating to poliomyelitis and acute flaccid paralysis surveillance in the United States. First, poliomyelitis surveillance data suggested a declining risk of poliomyelitis importations from nine imported cases for 1975-1979 to only two imported cases for 1985-1989, a relatively stable risk of vaccine-associated paralytic poliomyelitis (VAPP) over the last thirty years (with an overall risk of one case for 2.5 million doses of oral poliovirus vaccine administered), and a trend toward an increasing number of VAPP among persons with an immune deficiency disorder. However, all of the VAPP cases for whom this information was available tested negative for HIV. Second, limited epidemiological information from GBS hospital discharge data suggested a rate of 1.2 per 100 000 population under 15 years of age in the United States, a rate that is similar to the rate used in the Americas to assess the performance of the acute flaccid paralysis surveillance system. Third, large, linked databases from health maintenance organizations providing all preventive and curative care may be used as an alternative means

to conduct limited active surveillance for acute flaccid paralysis in a population of 10.5 million individuals under 15 years of age in the U.S.

7. Southern Cone

Even though wild poliovirus has not been isolated for six years and vaccination coverage rates are high, it is clear that:

1. The countries need to strengthen their surveillance of acute flaccid paralysis, with special emphasis on adequate stool sample collection from cases and contacts.

2. The analysis of coverage rates should be improved to look for unprotected areas in the interior of each country.

8. United Kingdom

Acute flaccid paralysis surveillance was successfully introduced into the United Kingdom in 1990. The surveillance is carried out through the British Pediatric Surveillance Unit, which provides active surveillance of rare pediatric conditions. All Consultant pediatricians receive a card every month, asking them to report if they have seen any cases of the twelve conditions that are under surveillance at any one time. Reporting compliance has always been around 90%. For certain conditions, special reporting requirements, such as contacting the Communicable Disease Surveillance Centre within 48 hours of diagnosis of acute flaccid paralysis, are made known to all card recipients. Similarly, all pediatricians are reminded of the special samples that are required, such as two stool samples 24 to 48 hours apart, within 14 days of the onset of paralysis, for the acute flaccid paralysis study.

In the first six months of the study, there have been 48 reports of acute flaccid paralysis; most have been of Guillain-Barré Syndrome. This number is equivalent to a rate of one case per 100 000 population under 15 years of age. Surveillance of cases of acute flaccid paralysis will continue for two years in the first instance.

9. Global Update on Polio

Considerable progress has been made on the global level towards polio eradication. Coverage with OPV3 at one year of age reached 85% globally in 1990. Reported coverage is highest in the Western Pacific Region and lowest in the African Region. WHO estimates that 440 000 cases of polio were prevented in 1990 as a result of immunization, but 150 000 cases were estimated to have occurred in that same year. The number of polio cases actually reported continues to decline, only 16 267 cases of polio were reported in 1990, compared to 32 631 in 1988. Fifty percent of reported polio cases were from the Southeast Asia Region and 35% from the Western Pacific Region. The American Region is close to eradication while cases in the European Region are increasing. Of note, polio is increasing in the republics of the former Soviet Union as a result of political change and a potentially interrupted vaccine supply. India has experienced significant decreases in the number of reported cases, mostly as a result of improved coverage. Polio eradication activities are in an early stage in some of the southern states of India. Egypt has committed to eradicate polio

by 1994 and is conducting national vaccination days and mop-up campaigns. The number of reported polio cases increased in Egypt in 1991 as a result of improved surveillance. The Western Pacific Region is targeting polio for eradication by 1995. Polio eradication plans are being implemented for all six polio endemic countries. The Philippines has just conducted their first mop-up activity in Manila. China reported almost 5 000 cases in 1990, but will probably report less than half that number in 1991. Vaccine supply for China remains an important obstacle to polio eradication.

Global obstacles to polio eradication include war and political instability, and lack of political commitment and funding. If global polio eradication is not achieved, polio eradication cannot be sustained in the American Region.

B. SURVEILLANCE AND CONTROL ISSUES

1. Analysis of Compatible Cases

Current levels of surveillance have contributed to substantial reductions in morbidity and mortality due to poliomyelitis in the Americas. Despite the success of the poliomyelitis eradication initiative, it has become critical that surveillance be intensified so that the absence of wild poliovirus circulation can be verified with confidence in countries not reporting confirmed cases of poliomyelitis. Cases of acute flaccid paralysis are classified as compatible with poliomyelitis, because investigations of such cases do not provide sufficient information to rule out wild poliovirus as a cause of paralysis. The greatest challenge for the eradication initiative may be reducing the numbers of compatible cases, particularly those with risk factors (age less than six years and the presence of fever at onset of paralysis), to allow for certification by the ICCPE.

2. Weekly Negative Reporting System

The negative case reporting systems for acute flaccid paralysis should be improved during the current phase of the poliomyelitis eradication initiative. It is recommended that each country evaluate which regions have low reporting rates. To improve the quality of negative reporting, health services need to carry out active case-finding, include more health services in the reporting system, improve the knowledge that medical and allied health personnel have about the system, and obtain the community's participation in reporting cases, especially in areas where access to health services is difficult.

3. Active Case-finding for Flaccid Paralysis

The protocol was presented with the idea of facilitating the ability to obtain comparable data and of having a methodology that will make it possible to estimate the sensitivity of the epidemiologic surveillance system while simultaneously searching for cases of flaccid paralysis that may have occurred in the community and did not seek assistance from the health services.

4. Mop-up in Peru

The Peruvian health ministry decided to carry out a Mop-up campaign in 890 districts of 13 states of the country in order to disseminate vaccine virus in the environment and interrupt transmission of wild poliovirus.

The goal is to immunize 1 850 000 children, to offer cholera prevention health education to over 1 900 000 families, and to carry out an active search of flaccid paralysis in all of the houses that are visited in the process. Vaccination will be administered on a house-by-house basis, and in two rounds (the first 7 to 15 March and the second from 29 April to 9 May).

This "sanitary mop-up" is being carried out as a joint effort of the health ministry, PAHO, UNICEF, AID, the Rotary Club, and IDB and includes the participation of the regional governments, the education sector, and the "Mother's Club" and the "Glass of Milk" community groups.

The first round was carried out with 10 000 supervisors and more than 56 400 vaccinators. Preliminary results based on data from 60% of the scheduled districts indicate that 1 294 000 children were vaccinated and 1 350 000 houses were visited.

5. Community Surveillance of Wild Poliovirus

Issues regarding the verification of the absence of wild poliovirus transmission take on increasing importance as the program arrives at its goal of polio eradication. Community surveillance, including community stool surveys of children and sampling and testing of community sewage, will need to be inplemented to rule out the presence of wild poliovirus in the community. However, barriers to verifying the absence of wild poliovirus in the environmental sewage remain and involve concerns about the sensitivity and usefulness of environmental studies of sewage. Studies of sewage using polymerase chain reaction for virus identification may be the easiest and most useful approach to community surveillance.

To that end, several countries in 1991 conducted operational research to evaluate the usefulness of the sampling and testing of sewage for wild poliovirus. Brazil, Colombia, Guatemala, and Mexico reported on their experience conducting such research, all of which will be quite useful to the program. These studies involved stool surveys of normal children who had not been fed OPV within the previous month, in high-risk areas. Virus isolation results were compared with sewage samples taken from the same communities. Of note, the study in Cartagena, Colombia, showed that in an area of the city with documented transmission of type 1 poliovirus circulation (a community stool survey yielded that 19 of 242 normal children sampled tested positive for wild-type 1 poliovirus), the same wild poliovirus was isolated from the community's sewage (six of 42 sewage samples tested positive for wild-type poliovirus).

C. LABORATORY NETWORK MEETING REPORT

Representatives of the laboratory network met on 14-15 March 1992, to discuss their laboratory results obtained in support of polio eradication activities and the remaining problems that require resolution.

During this meeting each laboratory presented its report. Of the 2 475 cases of acute flaccid paralysis reported in 1991, a total of 6 719 stools were processed, 4 282 from cases and 2 437 from contacts. Of the 345 polioviruses isolated, 15 were wild type 1, 329 were vaccine-related, and one isolate is pending characterization. Because cases of acute flaccid paralysis usually have more than one stool collected, the 15 wild type 1 poliovirus isolates correspond to nine confirmed polio cases reported in 1991 and occurred in only two countries (Peru: 1; Colombia: 8). Wild poliovirus was isolated from a contact of one case whose own specimens were negative for polioviruses.

In November 1991, a workshop was conducted at CDC on the molecular methods for the characterization of polioviruses for the virologists working in the regional laboratory network for polio eradication. Nucleic acid probe hybridization and polymerase chain reaction (PCR) were the topics presented during the workshop. The full transfer of these technologies, including equipment and supplies, is currently in progress. By the second semester of this year, with PAHO support, all laboratories in the network expect to be working with the new molecular technologies.

In 1991, considerable work was done for detecting wild polioviruses in the environment. In Cartagena, Colombia, wild type 1 poliovirus was isolated from environmental sewage specimens taken from the same community where silent transmission of wild poliovirus among normal children had been documented in a concurrent fecal survey. PCR analysis of sewage specimens of this study proved successful. The ad-hoc committee of the ICCPE, has recommended that the study be repeated in Cartagena, as well as at three other sites in the Americas thought to be at risk for wild poliovirus transmission.

Despite major advances and contributions to the program, representatives of the laboratory network recognize that some aspects of work should be improved. Therefore, they agreed to:

1) Improve communication between the epidemiologists and the laboratories;

2) Reduce turn-around time for reporting results, including molecular characterization of polioviruses;

3) Improve coordination of the information provided by laboratories and epidemiologists to PAHO. In this way, the PAHO Polio Bulletin will reflect the current status of virologic surveillance;

4) Establish criteria for continued storage of specimens;

5) Refine, in collaboration with the epidemiologist, the criteria for testing contact specimens;

6) Evaluate more efficient methods for analyzing large numbers of specimens. The evaluation will include pooling of samples and comparison of traditional and molecular methods;

7) Organize an additional laboratory network meeting in six months to discuss results and establish criteria for processing survey sampling;

8) Prepare to support activities associated with certification, including systematic community surveys and environmental surveillance;

9) Enhance the capabilities of the laboratories to perform better integrated analyses of their data.

D. NEONATAL TETANUS

Most of the countries followed the recommendations of the previous TAG meeting. **Table 5** presents neonatal tetanus incidence data from 1985 to 1991. Haiti did not present information concerning surveillance activities and vaccination of women of childbearing age during 1991.

Table 5.
Annual Incidence of Neonatal Tetanus Region of the Americas, 1985-1991

Country	1985		1986		1987		1988		1989		1990		1991	
	C	R	C	R	C	R	C	R	C	R	C	R	C	R
Argentina	19	.02	18	.02	13	.01	14	.01	18	.03	14	.02	11	.02
Bolivia	9	.04	69	.28	86	.35	118	.48	93	.38	42	.19	48	.22
Brazil	323	.08	272	.06	252	.06	324	.08	163	.04	268	.06	237	.05
Colombia	252	.30	211	.26	203	.24	178	.24	160	.22	166	.25	N/A	-
Dom. Rep.	12	.05	8	.03	7	.03	33	.14	13	.06	12	.05	4	.02
Ecuador	91	.36	74	.29	80	.31	126	.59	58	.27	88	.34	80	.18
El Salvador	52	.32	39	.21	26	.14	33	.66	28	.54	25	.11	18	.07
Guatemala	17	.05	8	.02	24	.08	28	.10	113	.38	50	.16	15	.04
Haiti	57	.28	57	.28	75	.35	63	.29	153	.19	143	.19	NA	-
Honduras	76	.69	59	.52	59	.51	55	.46	44	.37	38	.30	18	.23
Mexico	NA	-	57	.02	84	.04	108	.05	87	.04	145	.74	152	.06
Nicaragua	30	.27	28	.22	32	.24	26	.17	17	.10	15	.09	11	.07
Panama	12	.20	12	.20	7	.11	7	.11	9	.14	5	.08	6	.09
Paraguay	76	.69	59	.52	59	.51	54	.46	37	.30	38	.30	33	.26
Peru	72	.18	89	.22	138	.33	143	.34	183	.44	93	.24	89	.15
Venezuela	70	.14	59	.11	52	.09	51	.09	41	.08	28	.05	36	.06
TOTAL	1286		1119		1197		1361		1217		1170		899	

C= Cases R= Rate N/A= Data not available

Following the presentations of Venezuela and Brazil, the development of surveillance systems was discussed. Venezuela and Colombia commented on the necessity of identifying population at especially high risk levels within the high risk areas. This was demonstrated in the field in the mop-up operation that Mexico conducted in the areas at high risk for neonatal tetanus. The remarkable impact on the annual incidence in Guatemala is attributed to the strategy of concentrating efforts in high risk areas. Brazil presented the advantages and limitations of using national morbidity and mortality data. Mexico also remarked on the sensitivity of using the available information for identifying high risk areas. The achievements reached by Honduras and Bolivia in Tetanus Elimination in urban areas underscored the importance of targeting elimination activities towards populations that are easily accessible. In regards to rural areas, these two countries have developed efforts which engage the participation of the traditional birth attendants in vaccination activities. We highlight the remarkable impact in the incidence of neonatal tetanus by concentrating their efforts in the high risk areas.

As a consequence of improved surveillance, one could falsely conclude that there has not been an impact on neonatal tetanus when aggregate regional data is analyzed. However, when one analyzes neonatal tetanus incidence data in cohorts of municipalities grouped by the year they were identified to be at risk, one can see a tremendous impact of the program.

Because of their excellent sanitation, high percentage of hospital births, and low proportion of women of childbearing age in high risk areas, Venezuela and Panama were challenged to vaccinate 100% of the women of childbearing age in high risk areas before the next TAG meeting in 1993. Argentina will accelerate its program to reach the target population before 1995.

To reach the elimination target for the Region, it will be necessary to vaccinate 20 million women of childbearing age (22% of the women in endemic countries) who live in 1 140 counties (10% of the total counties in endemic countries). This will require additional activities incurring a cost estimated at 34 million US dollars. A critical assumption for the success of the EPI and global elimination of neonatal tetanus is that tetanus toxoid (TT) in current use is potent. Recently, anecdotal reports from Asia and Africa describe the failure of TT to prevent neonatal tetanus in the newborns of women who reportedly were adequately vaccinated. Special studies have suggested low efficacy of TT in Bangladesh (45%) and Pakistan (53%). WHO has proposed to the World Health Assembly that manufacturers of all vaccines, including TT, be evaluated to determine whether the production, quality control, and potency meet WHO requirements. The Region of the Americas has already begun to take steps to carry out this proposal with TT. This presentation focused on a summary of a protocol developed as a plan of action for the evaluation of TT in countries outside of the Americas. The protocol was prepared through the collaboration of WHO, CDC, and the Task Force for Child Survival. Outside of the Americas, at least 32 countries have facilities that produce TT. However, only the six manufacturers that supply TT to UNICEF have WHO-supervised assessment of TT quality and potency. The remaining 26 countries have not undergone a WHO approved review process and, hence, the quality of the TT produced is unknown. The plan of action contains steps to assess, over a time period of 18 months, TT currently in use in 13 high priority countries based on their high rates of neonatal tetanus. The plan includes a protocol to test TT by potency testing and by TT seroconversion studies.

E. MEASLES

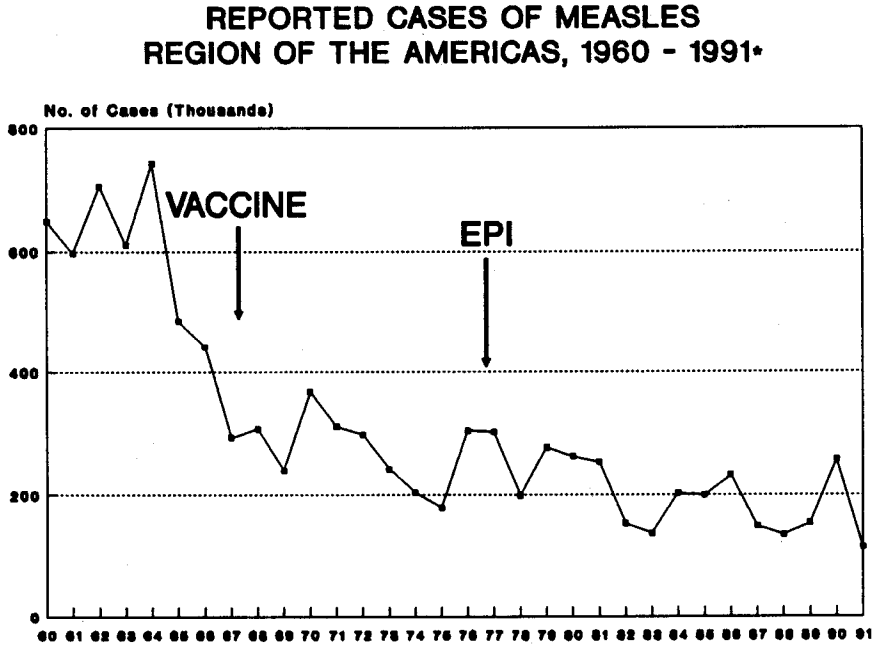
Figure 8 shows the number of cases of measles reported to PAHO from 1960 to 1991 and the impact that the introduction of the vaccine has had on reducing the incidence of disease.

Nevertheless, epidemics continue to occur. Among the latest countries to have measles epidemics, Costa Rica and Uruguay had in common the fact that they had been administering the vaccine at 12 months of age. The attack rate during the epidemics was greater in children under one, therefore the target age range for vaccination efforts was expanded to include all children between nine months and five years of age.

Meanwhile, the English-speaking Caribbean countries and Cuba have begun a Measles Elimination Plan, the preliminary results of which are promising. The Elimination Campaign focused on vaccinating children between the ages of nine months and 14 years, without regard to previous vaccination status. The campaign lasted one month in the English-speaking Caribbean and three months in Cuba.

Lastly, Central America will begin activities with an initial phase aimed at measles control which will include vaccination of all school children; once sufficient resources are available, a full-fledged elimination plan will be put into action.

Figure 8.



SOURCE: PAHO
* 1991 DATA IS PROVISIONAL

1. Brazil

Brazil will implement its elimination plan this year, which has targeted vaccinating 95% of 50 million children between nine months and 14 years of age. To this end, large-scale social mobilization efforts are being prepared to initiate the vaccinations. The proposal to eliminate measles came after a new increase in the incidence of the disease was noticed in 1990. The following strategy has been proposed to carry out the campaign:

- increase reporting
- train people in charge in each county
- case definition
- use of laboratories for diagnosis
- social mobilization (intersectoral coordination)
- identify high-, medium- and low-risk areas in the country in order to channel greater assistance to the most complex areas
- 50 million dollars will be needed to carry out the campaign

2. Caribbean

The Measles Elimination Plan was started in 1991 and has yielded positive results so far. One and one half million children were vaccinated following standard, well-defined strategies--strengthening the EPI, holding mass vaccination days, maintaining significant epidemiologic surveillance, performing case investigations for all suspected cases, and enacting prompt control measures against outbreaks--that were applied in all the countries. There are currently 291 confirmed cases, most of them in Jamaica. The main concern is how to finance the Plan and obtain sufficient vaccine to sustain future endeavors.

3. Costa Rica

During 1990-1991, Costa Rica experienced a greater measles epidemic than the last one which had occurred in 1986 and 1987. There were a total of 6 340 cases in the 1991 epidemic, yielding an incidence rate of 182.9 and a mortality rate of 0.90 per 100 000. Data showed that the greatest attack rate was among children under one year of age. Given that the age for vaccination was 12 months, the most vulnerable group (those younger than 12 months) was therefore unprotected. The vaccination age was hence lowered to nine months. Ninety percent coverage was achieved in 1990 and 95.8% was reached in 1991. Nonetheless, the cases that occurred were not studied to determine their vaccination status, and such a study is advisable.

4. Cuba

Since the coverage rate among children under five--around 83%-- was not having an impact on the incidence of disease, the range of ages targeted for vaccination was widened, and in 1986, for three consecutive months, all children under 15 were vaccinated. Meanwhile, a solid epidemiologic surveillance system was consolidated and maintained. Since 1987 coverage rates of over 90% have been achieved. At the present time, the majority of the counties have gone over four years without measles and have established obligatory

epidemiologic surveillance criteria such as mandatory reporting, case classification, laboratory diagnosis (with paired sera), and control measures.

5. Uruguay

The biggest epidemic took place a decade ago (in 1981), but two significant outbreaks have occurred since--one in 1989 and one in 1991, in which 1 055 cases occurred. The attack rate was the highest that had been seen in four years. The data indicated that the highest attack rate among vaccinated children was in the five to nine year old age group. It should be noted however, that there were a number of individuals who did not have vaccination records and may not have been vaccinated. Uruguay's standard age for measles vaccination is 12 months. The country plans to conduct trials of a double dose schedule and to study vaccine efficacy.

6. Issues Regarding Measles Laboratory Diagnosis

There is no ideal test for the laboratory diagnosis of measles. The current ELISA test to confirm the presence of IgM antibodies using a single serum sample seems to be the method of choice to support the Measles Elimination Program. The test was developed at the CDC and should be transferred to several laboratories in the Region. It is necessary, however, to continue carrying out studies to evaluate the test. Simultaneously, the usefulness of other methods to diagnose measles -- such as the detection of the measles antigen in nasopharyngeal secretions through the PCR, EIA, IFA and virus cultures, and IgA detection in saliva -- should be assessed.

7. Update on Edmonston-Zagreb Vaccine

One of the most important obstacles to achieving measles control has been the inability of currently available vaccines to protect infants from measles beginning at six months of age. In 1989, the Global Advisory Group for EPI recommended the use of high-titre Edmonston-Zagrev (EZ) vaccine at six months of age in countries where there was significant risk of death from measles before nine months of age. This recommendation has not been implemented because of a number of problems. They include:

a) The lots initially procured by UNICEF did not meet WHO thermostability requirements.

b) Because of the quantity of virus in the high-titre vaccine, EZ vaccine could not be produced at the price initially projected by UNICEF and the manufacturers.

c) EZ vaccine produced by different manufacturers produced different rates of seroconversion and could not be assumed to be identical.

d) Manufacturers were not able to produce sufficient quantities of high-titre EZ to meet projected demand. Problems with thermostability and standardization have been resolved. In early 1991, a study from Africa became available which suggested that female infants receiving high titre EZ vaccine were at increased risk of long term mortality. The study was reviewed by an expert WHO committee in February, 1991 which concluded that the data were

suspect and that there should be no change in the policy. In October, preliminary data from a second study in the Americas confirmed the long term mortality in females. The expert committee will be reconvened in June, 1992 to review all data on EZ and reconsider the recommendation. High titre EZ vaccine is still unavailable for routine use at six months.

F. ADVERSE EVENTS

Since 1985, Sao Paulo, Brazil, has been investigating reports of these events while simultaneously training medical and health personnel in this area. The biologicals that have been associated with adverse vaccination events are DPT, BCG, and the vaccine against B and C meningococcal infections. The most frequent adverse events are abscesses, seizures, persistent crying, hypotonic syndrome, and irritability.

Since 1987, Canada has set up a data bank that is well organized and contains more than 17 million reports of adverse events, of which 58% fit the criteria of vaccine-related events, accounting for a total of four deaths and 69 patients (0.9%) who had residual effects. It is felt, in conclusion, that the sensitivity and timeliness of reporting should be improved, as should the standardization of reporting methods. It should also be noted that the cause of an adverse event may not be related directly to the vaccine but be due to programmatic errors, such as mistakes in preparing, administering and/or managing vaccines, or to unrelated events that happened by chance at the time of vaccination.

Canada has developed a proactive global approach to postmarketing surveillance of adverse vaccine reactions. Among other activities, it includes a review of statistics in the Canadian mortality and hospital discharge databases, developing active surveillance in paediatric hospitals, conducting linkage of immunization databases and health care utilization databases, and working with the College of Family Physicians to develop a health diary methodology to collect information on common adverse events. The cornerstone of surveillance remains the spontaneous reporting system for adverse vaccine reactions by health care providers through local health departments with centralization at the federal level. After much efforts to standardize the reporting, this system which is one of the most sensitive in the world, is becoming very useful to assess potential problems through lot by lot monitoring and to maintain public confidence in the vaccine and therefore help maintain high immunization coverage. Despite the fact that from 1987 through 1991, more than 20 000 reactions were reported, only very few severe neurologic disorders could be observed. The average rate of reported victims was nearly 21 per 100 000 doses distributed.

G. PERTUSSIS

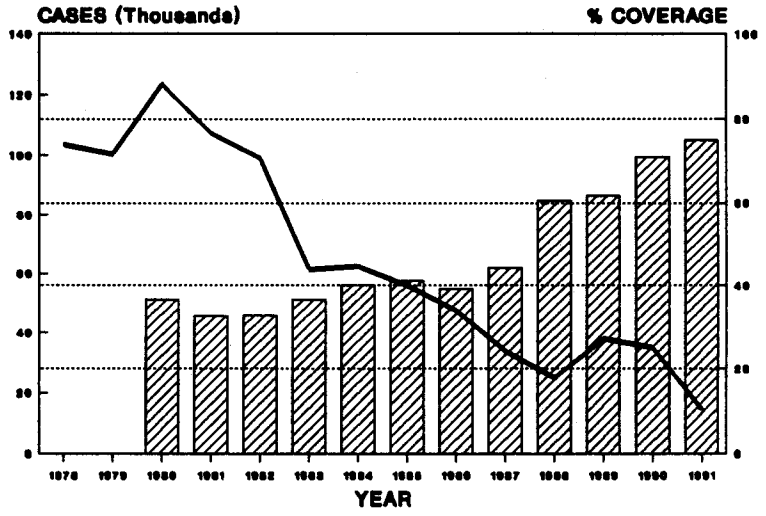
In most countries of the Region of the Americas, the data is inadequate for assessing any changes in the epidemiology of pertussis which have resulted from increases in DPT vaccination coverage (**Figure 9**).

Two systems for national surveillance of pertussis in the United States were discussed, one of which emphasizes timely weekly reporting to CDC of suspected pertussis cases, and the other of which was designed to collect detailed demographic and clinical information on each case. Recognized limitations of these data include underreporting with disproportionate representation of classical and severe cases, lack of uniform reporting criteria among the states, and undue reliance on

laboratory diagnosis of pertussis by some states. However, these surveillance systems are most useful for monitoring long-term epidemiological trends of pertussis, obtaining information on the relative severity of the disease for different subgroups of infected persons, evaluating the effectiveness of measures for prevention and control, and identifying gaps in the current control strategy. From 1980 through 1989, 27 826 cases of pertussis were reported to CDC, for an average annual crude incidence of 1.2 cases per 100 000 population.

Figure 9.

PERTUSSIS CASES AND DPT VACCINE COVERAGE IN THE AMERICAS, 1978-1991



SOURCE: PAHO

The incidence of reported disease increased in all age groups during this period, but the increase was disproportionately large among adolescents and adults. Infants between one and two months of age were at highest risk for pertussis (average annual incidence, 62.8/100,000). Infants under two months of age had the highest reported rates of pertussis-associated hospitalization (82%), pneumonia (25%), seizures (4%), encephalopathy (1%), and death (1%). Rates of complication were generally higher among unvaccinated children than among those who had received three or more doses of DPT vaccine; 64% of children three months to four years of age who had reported cases of pertussis had not been immunized appropriately for their age. Whereas control of pertussis in the US may be further improved through increased levels of DPT vaccination among eligible infants and children, the use of acellular vaccines in adolescents and adults may also be needed to reduce the burden of pertussis in very young infants.