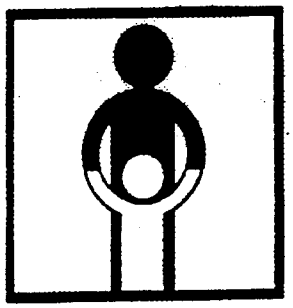

NINTH TECHNICAL ADVISORY GROUP (TAG) MEETING ON VACCINE-PREVENTABLE DISEASES

FINAL REPORT

Guatemala, Guatemala
12 to 15 March 1991

Expanded Program on Immunization
Maternal and Child Health Program
Pan American Health Organization

Table of Contents

I. INTRODUCTION

The Ninth Meeting of the PAHO Technical Advisory Group (TAG) on Vaccine Preventable Diseases took place in Guatemala City, Guatemala, from 12 to 16 March, 1991. Participants were welcomed by Dr. Antonio Casas, PAHO Representative in Guatemala, on behalf of Dr. Carlyle Guerra de Macedo, the PAHO Director. The Meeting was officially opened by the President of Guatemala, Ing. Jorge Serrano Elias, who emphasized that prevention is the most cost effective intervention available to policy makers in the area of health. The TAG members present were Drs. Hilda Alcalá, D.A. Henderson (Chairman) and Joao Baptista Risi, Jr. Unable to attend were Drs. José Manuel Borgoño, Peter Figueroa, and Alan Hinman (Rapporteur). Dr. Frederick Robbins, the Chairman of the Poliomyelitis Eradication International Certification Commission for the Americas established by the PAHO Director in July, 1990, also attended the Meeting. Representatives of the USAID, UNICEF, IDB, and Rotary International, agencies that are collaborating with the countries in this priority program, were also present at the meeting.

The World Health Organization was represented by personnel from its Headquarters in Geneva and from the Regional Offices of the European and Eastern Mediterranean Region. Representatives from Egypt, England and France were also in attendance. Dr. D. A. Henderson chaired the Meeting, Dr. Joao Baptista Risi, Jr. was the Rapporteur *(ad-hoc)* and Dr. Ciro de Quadros served as Secretary.

II. CONCLUSIONS AND RECOMMENDATIONS

Each TAG meeting has documented significant progress over the previous one; this meeting marked yet another new level of achievement. Immunization coverage with the vaccines included in the program reached an all-time high in the Americas: no vaccine shows coverage of less than 70%; levels of coverage of 80% and greater are recorded by several subregions, such as the English-speaking Caribbean countries and the Southern Cone.

Vaccine-preventable diseases continue to show a declining incidence and poliovirus transmission appears on the verge of being interrupted throughout the Western Hemisphere. Despite examination of thousands of stool specimens, only 14 during the last 12 months have revealed wild poliovirus; the most recent isolate was from a case in January, 1991, in Cartagena, Colombia. Over four years have elapsed since the last isolation of wild poliovirus in the Southern Cone countries; more than eight years since an isolate was found in the English-speaking Caribbean, more than three years since the last isolation of indigenous wild poliovirus in Central America (the last three isolates appear to have originated from a recent introduction from Mexico), two years since the last in Brazil and five months in Mexico. It is notable that the 14 wild poliovirus isolates detected during 1990 represent a decrease of 40% compared with the 24 registered in 1989. The significance of these findings is even more remarkable when one takes into account the enormous improvement in surveillance for acute flaccid paralysis (AFP) during the last year. In all, 2,476 reports were investigated, the largest number investigated to date in a single year. The first and only case so far in 1991 was detected in Cartagena, Colombia, in January, 1991.

The TAG recognizes that this tremendous progress can be attributed in substantial measure to the political and social commitment which in turn has generated a high level of priority being given to the immunization programs in all countries of the Americas, in PAHO, and the collaborating national and international organizations. The strategies of national vaccination days and mop-up operations have been highly effective in complementing the vaccination activities of the health facilities. The high level of coordination achieved between all governments and the agencies supporting the immunization efforts in the Western Hemisphere (USAID, UNICEF, ROTARY, IDB, CPHA, and PAHO) was also critical for smooth and creative implementation of the program and for optimal use of available resources.

The TAG notes with satisfaction the considerable improvement in all performance indicators, including an increase in the number of health units included in the weekly surveillance system - now nearly 20,000 - approximately 70% of which report promptly each week; the increase in the proportion of AFP cases being reported within 15 days of onset (nearly 80%); and the increase in the proportion of AFP cases with final diagnoses (now 95%). Additionally, there is a commendable increase in the number of "municipios" which are maintaining immunization coverage rates over 80%, almost 60% of the 7,408 "municipios" for which information was available.

However, there are still problems of concern. Most critical is the quality of surveillance for wild poliovirus now being accomplished through examination of stool samples from AFP cases and their contacts. Progress in this activity is disappointing. Only 48% of all cases of AFP reported during 1990 had two stool specimens properly and promptly collected and sent to the laboratory. Although this represents considerable progress when compared with a figure of 34% obtained in 1989, the lack of laboratory information on such "compatible" cases undoubtedly results in failure to confirm a number of cases of AFP as being caused by wild poliovirus. In such instances, the possibility of wild poliovirus transmission cannot be ruled out and countries with such cases could not be certified as free of circulation, even in the absence of "confirmed" poliomyelitis cases. Particularly of concern are cases which are "lost to follow up," a number amounting to one third of all AFP cases during 1990.

Confirmation of cases through specimens obtained from contacts is proving to be most important. During 1990, one out of four cases confirmed by wild poliovirus isolation resulted from investigation of contact specimens. When it is seen that only one third of the cases had proper collection of specimens from contacts, there is cause for concern.

It is apparent also that special efforts are needed to ensure that all required information is properly entered into the PAHO information system, PESS, for all cases of AFP. For example, only 44% of the cases were recorded as having a precise final diagnosis, and other variables, such as fever at onset of paralysis showed data for only 45% of all cases.

The importance of careful monitoring of vaccine potency is well illustrated by the fact that over 30% of the cases which occurred in the Americas over the last two years could be attributed to use of a sub-standard vaccine formulation. Hopefully, the problem is now resolved.

With full appreciation of the exceptional progress made by virtually all countries in the control and elimination of vaccine-preventable diseases, the TAG reaffirms the recommendations of its Eighth Meeting, held in Mexico City, 19-22 March 1990 and makes the following assessment and offers additional recommendations.

Of highest priority is the elimination of what appears to be only a few remaining foci of wild poliovirus infection. The Andean Subregion is of special concern and demands urgent attention. A number of foci are undoubtedly present along both the Atlantic and Pacific coastal areas of Colombia. Neighboring areas of Venezuela and Ecuador are at special risk. Intensive measures are indicated, especially in Colombia where mop-up activities are more limited in intensity and scope than appears to be required.

Foci are also present in Northern areas of Peru adjacent to Ecuador and could well be present in other parts of the country. Peru's present problems involving both socio-political disturbances and a cholera epidemic are recognized. Because of these problems, the TAG recommends that all possible assistance be provided to strengthen their surveillance/containment/vaccination program. Overall, a special program (such as the one recently conducted in Central America) encompassing Colombia, Peru, Ecuador, and neighboring areas of Venezuela now appears to be needed.

The intensive efforts made in Mexico and Central America to eliminate transmission of wild poliovirus appear to be progressing well, but a special alert and special measures will be required for the balance of the year, focusing on periurban areas and migrant groups.

All countries should continue to enhance their efforts to document surveillance and program activities of the type which will be needed for certification. From the reports presented, it would appear that programs in Brazil and Panama, in particular, deserve special attention, for the improvement of surveillance indicators, especially the prompt collection of adequate specimens for the laboratory.

The data presented on immunization coverage and the striking improvements in surveillance of AFP demonstrate the benefits that could be accrued in other parts of the immunization program, even in other primary health care interventions.

Specific Recommendations:

A. Poliomyelitis Eradication:

1. Vaccines

* Countries must ensure, at all times, that the vaccines being used in the program comply with the minimum potency requirements as recommended by PAHO and WHO: with a balance of 10:1:6 for types 1, 2, and 3, respectively. All countries producing vaccine should have batches of their vaccines tested in the PAHO/WHO reference laboratories.

2. Specimens

* Added efforts should be made in specimen collection. This is critical at this stage in the program. Only if specimens are promptly collected from both cases and contacts will it be possible to determine that transmission of wild poliovirus has been interrupted. Two specimens containing an adequate quantity of stool material are required from each child with AFP and a specimen from ***at least*** five contacts less than five years of age. This implies a total of seven stool specimens for each case.

* Because it is impossible to know which children may subsequently be lost to follow-up, it is critical that stool samples and clinical information be collected at the very first encounter. After collecting the specimens, they must be promptly refrigerated and shipped to the laboratory in refrigerated containers to arrive at 4°C or below.

* Epidemiologists and virologists must work closely together to coordinate shipment of specimens and to ensure that all such shipments have ice remaining in the container at time of receipt in the laboratory.

3. Cases of Acute Flaccid Paralysis

* Highest priority should be given to cases of AFP under six years of age who experience fever at onset of paralysis and whose paralysis develops over a period of four days or less. Data show that such illnesses are especially likely to be polio. Special efforts should be made to get samples from the patient ***and from contacts***, and special mop-up vaccination programs (two rounds of house-to-house vaccination at least one month apart in a very extensive geographic area, usually an entire province or state) should be started promptly. A detailed

clinical and laboratory justification should be given for any cases of this type which are categorized as "discarded".

* A definite diagnosis of polio can be made (or rejected) by examination of the spinal cord. It is important that a qualified and experienced pathologist examine such specimens, if available, and that a suspension be sent directly to a reference laboratory so that efforts can be made to grow the poliovirus. A death diagnosed as poliomyelitis by pathology may be caused by either wild or vaccine virus and it is most important to determine which.

* A clinical review of cases of Guillain-Barré Syndrome shows that it is not possible to differentiate between poliomyelitis and GBS with certainty. Thus, it continues to be essential that GBS cases be considered as probable polio cases until all laboratory data are available and a 60-day evaluation is conducted.

4. Reporting of Data

* Information on all investigated cases must be available at the country level, but such data must also be entered into the regional surveillance system (PESS) to allow proper monitoring of regional progress towards eradication.

5. High-risk Areas

* Periurban areas and migrant groups continue to play the most important role in poliovirus transmission and should continue to be targeted for aggressive and extensive house-to-house vaccination.

6. Environmental Sampling

* The recommendations of the Consultation on Environmental Sampling and Testing Procedures for wild poliovirus should be promptly implemented, namely:

a. Sampling and testing procedures should be standardized.

b. Environmental sampling should begin at sites determined to be at highest risk for wild poliovirus transmission wherever cases have recently been confirmed (e.g. Andean subregion), and during the seasonal peak incidence.

c. These environmental studies should be related to isolation results from fecal specimens obtained from specially designed community surveys performed at the same time and site.

7. Research

* There is a need to determine the rapidity with which poliovirus in stool specimens is destroyed by heat. Some data may be available in the literature from previous studies conducted during the 1953 to 1958 period. Additional studies, using current isolation methodologies, would be useful. A selection of stool specimens should be titered after being held at two or three different temperature levels (e.g. 4°C, 25°C, and 37°C) for periods of up to 10 days.

* The results from measles vaccine trials in six-month-old infants in Haiti and Peru were presented. Edmonston-Zagreb (EZ) vaccine in $10^{4.9}$ or $10^{5.6}$ $TCID_{50}$ induced protective levels ($\geq$200 in mIU/mL) of neutralizing antibodies in 82% of Haitian infants and 82% of Peruvian infants vaccinated at 6 months of age. These responses were similar to the antibody response following Schwarz strain vaccine at 9 months of age.

The response following high titer Biken-Cam vaccine was considered inadequate with only 45% of Peruvian infants responding. The current WHO policy endorses the use of EZ vaccine produced in Yugoslavia at a titer of $10^{4.7}$ $TCID_{50}$ or greater at 6 months of age in areas where measles is an important cause of death in infants under 9 months of age.

WHO convened an expert group to review concerns raised by investigators in Senegal and Guinea Bissau regarding the long term safety of the high titer vaccine. The expert group concluded that the data were inconclusive and the WHO policy for use of these vaccines should continue. Long term follow-up of participants in these field studies was strongly encouraged.

* Single use self-inactivating syringes are now available. A modification of the original Ezeject device will soon be field tested for delivery of tetanus toxoid. Since tetanus toxoid is relatively heat stable, this device could be tested for extending the cold chain using nurse/midwives in areas that are difficult to reach.

* Priority should be given to operational research projects that will result in higher coverage rates. Identification of non-participants in National Vaccination Days and evaluation of reasons for non-compliance should continue. The excellent work on evaluating missed opportunities and correction of inappropriate practices by health care providers should continue.

8. Certification Planning

* An *ad hoc* TAG meeting should be convened prior to the next meeting to develop specific plans for obtaining environmental specimens during the coming years. Laboratory staff, epidemiologists and engineers will be required to contribute to the exercise.

9. Laboratory Support

* The TAG endorses the recommendations of the Final Report of the Pre-TAG Workshop of the PAHO Polio Laboratory Network (See section 3.9, page 15).

B. Neonatal Tetanus Elimination:

* All countries should establish a tetanus surveillance system to record neonatal and postnatal tetanus cases separately.

* All countries should investigate all neonatal tetanus cases and institute active search for such cases in health facilities, mainly hospitals.

* Vaccinations should be concentrated among women of childbearing age who live in the high-risk areas and every contact with them should be used for vaccination. Prenatal and family planning programs should be used to reach such women.

* Traditional birth attendants should be involved in tetanus toxoid (TT) vaccinations and surveillance activities for neonatal tetanus.

* New simple injection technologies should be applied to TT vaccination that could be easily used by lay personnel and introduced for routine use by national programs.

C. Measles Control:

In spite of increased overall vaccination coverage, measles outbreaks have continued to occur throughout the Region. This is due to the fact that except for Cuba, even those countries with the highest immunization coverage have not achieved levels that would ensure the elimination of transmission.

Efforts carried out in Cuba and the measles elimination initiative in the English-speaking Caribbean will permit the development of effective strategies aimed at controlling/eliminating the disease.

The low coverage rates that exist among priority groups continue to be the greatest impediments to the control of measles and efforts at increasing coverage among children under two years of age should be undertaken.

D. Hepatitis B Control

Countries that have areas or special populations with a high incidence of Hepatitis B should make efforts to expand the use of Hepatitis B vaccine in such areas or populations, taking into account the present high cost of the vaccine and the priority of this problem compared to other health problems.

E. Elimination of Missed Opportunities for Vaccination:

Since the last TAG Meeting the majority of countries have conducted studies on missed opportunities for vaccination, which have established that false contraindications are the main reasons for missed opportunities.

Based on these observations, the TAG recommends that concrete efforts be implemented to eliminate such missed opportunities. The examples of El Salvador and Bolivia with vaccination at hospital sites should be evaluated and the possibility of replication in other countries should be seriously considered. Additional operational research studies to determine the effectiveness of various strategies to reduce missed opportunities should be conducted.

As polio eradication becomes a reality, national immunization programs should use the experience gained to benefit the overall expansion of the infrastructure for surveillance and control of other preventable diseases. For example, mop-up operations could be used to increase coverage with all vaccines being used by the national program and institutional vaccination should gain particular attention.

III. SUMMARY OF PROGRESS

1. VACCINE COVERAGE IN THE REGION OF THE AMERICAS, 1989-1990

REGION & COUNTRY	POPULATION (less than 1 year)		OPV3 %		DPT3 %		MEASLES %		BCG %	
	89	90	89	90	89	90	89	90	89	90
ANDEAN REGION	**2,456,562**	**2,363,278**	**69**	**76**	**60**	**71**	**55**	**67**	**72**	**79**
Bolivia	261,582	221,956	49	50	39	41	47	53	28	48
Colombia	669,809	685,108	90	93	78	87	64	82	94	95
Ecuador	316,622	320,852	64	67	55	68	57	61	91	88
Peru	670,000	600,904	60	73	58	72	52	64	62	83
Venezuela	538,549	534,458	67	72	55	63	50	62	68	63
BRAZIL*	**4,307,582**	**3,610,961**	**97**	**93**	**54**	**81**	**58**	**78**	**70**	**78**
CENTRAL AMERICA	**989,404**	**1,016,513**	**71**	**80**	**65**	**74**	**69**	**78**	**59**	**70**
Belize	6,701	7,200	71	80	71	84	68	81	87	80
Costa Rica	82,451	82,500	87	95	87	95	78	90	90	92
El Salvador	182,173	186,267	64	76	64	76	73	75	63	60
Guatemala	339,385	349,847	58	74	50	66	54	68	21	62
Honduras	174,262	180,721	86	87	85	84	94	90	80	71
Nicaragua	143,200	148,085	85	86	66	65	63	82	92	81
Panama	61,232	61,893	72	86	70	86	73	99	87	97
SOUTHERN CONE	**1,144,876**	**1,090,660**	**83**	**90**	**82**	**88**	**85**	**92**	**88**	**98**
Argentina	677,398	602,288	86	89	80	85	89	95	92	99
Chile	279,150	293,556	95	99	95	99	91	98	95	97
Paraguay *	134,928	138,802	41	76	61	78	53	69	53	90
Uruguay	53,400	56,014	88	88	88	88	82	82	99	99
LATIN CARIBBEAN	**606,619**	**616,560**	**71**	**74**	**61**	**67**	**56**	**73**	**57**	**79**
Cuba *	187,529	186,658	95	94	95	92	97	94	97	98
Haiti	201,707	207,637	50	40	50	41	31	31	40	72
Dominican Rep.*	217,383	222,265	70	90	43	69	43	96	38	68
MEXICO	**2,579,200**	**1,970,515**	**96**	**96**	**65**	**66**	**85**	**78**	**80**	**70**
LATIN AMERICA	**12,084,243**	**10,668,487**	**86**	**87**	**62**	**75**	**66**	**77**	**73**	**78**
ENGLISH CARIBBEAN	**131,672**	**134,637**	**82**	**86**	**82**	**86**	**72**	**75**	**61**	**62**
Anguilla	157	200	99	99	99	99	92	99	99	99
Antigua	1,088	1,114	99	99	99	99	95	89	-	-
Bahamas	5,641	6,013	82	82	86	86	87	87	-	-
Barbados	4,032	4,040	80	90	78	91	85	87	-	-
Cayman Islands	378	434	93	99	93	99	89	89	81	81
Dominica	1,715	1,745	94	94	92	94	88	88	99	99
Grenada	2,613	2,650	86	69	87	80	89	85	-	-
Guyana	17,658	18,500	79	79	77	83	69	73	76	85
Jamaica	57,487	59,104	84	87	85	86	71	74	99	98
Montserrat	199	154	93	99	93	99	89	99	60	99
St. Kitts & Nevis	924	980	99	99	99	99	90	99	...	...
St. Lucia	3,530	4,380	93	90	92	89	91	82	99	94
St. Vincent	2,482	2,505	97	92	98	98	99	96	99	99
Suriname	10,000	9,000	71	81	72	83	73	65	-	-
Trinidad & Tobago	23,280	23,280	77	87	77	82	59	70	-	-
Turks & Caicos Isl.	250	300	89	98	89	97	76	81	99	99
British Virgin Isl.	238	238	97	99	99	99	87	99	99	99
NORTH AMERICA	**3,998,895**	**4,009,883**	...	...	...	...	...	...	...	...
Bermuda	895	883	76	62	74	62	67	63	-	-
Canada	358,000	362,000	...	...	...	...	...	...	...	...
USA	3,640,000	3,647,000	...	...	...	...	...	...	...	...
TOTAL**	**16,214,810**	**14,813,007**	**86**	**87**	**62**	**76**	**66**	**77**	**73**	**78**

\- Vaccine not in use
... No data available
Source: PAHO (Provisional data)

* Coverage calculated with two doses of OPV
** TOTAL coverage does not include North America

2. INCIDENCE OF SELECTED DISEASES REGION OF THE AMERICAS, 1989-1990

SUBREGION AND COUNTRY	MEASLES		NEONATAL TETANUS		DIPHTHERIA		PERTUSSIS	
	1989	1990	1989	1990	1989	1990	1989	1990
ANDEAN REGION	28,330	24,071	539	337	124	45	5,705	4,100
Bolivia	778	984	86		11	4	717	
Colombia	12,598	11,554	171	162	42	24	2,384	1622
Ecuador	3,649	1,673	58	78	3		256	487
Peru	1145	418	183	69	68	17	1,714	776
Venezuela	10,160	9,442	41	28	0		634	1215
SOUTHERN CONE	17,257	4,962	53	51	64	41	3,560	2,213
Argentina*	4,009	2,022	14	14	20	31	2,943	1974
Chile	13,008	1,846	2		36		206	
Paraguay	220	984	37	37	8	10	371	78
Uruguay	20	110	0	0	0	0	40	161
BRAZIL	22,889	50,440	392	242	804	733	13,804	13,973
CENTRAL AMERICA	26,028	37,845	107	137	10	2	623	813
Belize	11	70	11	0	0	0	1	
Costa Rica	33	81	0	0	0	0	85	75
El Salvador	16,536	1,112	33	28	0	0	46	211
Guatemala	2,413	8,802	15	50	10	2	145	138
Honduras	6,353	8,360	19	39	0	0	78	147
Nicaragua	381	17,529	17	15	0	0	226	220
Panama	301	1,891	12	5	0		42	22
MEXICO	20,381	64,571	87	123	6	0	1,978	794
LATIN CARIBBEAN	2,097	4,908	166	155	38	27	2,160	1,162
Cuba	12	17	0	0	0	0	70	22
Haiti	580	1414	153	143	2	0	1835	913
Dominican Republic	1,505	3,477	13	12	36	27	255	227
LATIN AMERICA	116,982	186,797	1,344	1,045	1,046	848	27,830	23,055
ENGLISH CARIBBEAN	8183	4500	0	0	1	0	22	21
Anguilla	7	15	0	0	0	0	0	0
Antigua	0	0	0	0	0	0	0	0
Bahamas	56	65	0	0	0	0	0	0
Barbados	2	51	0	0	0	0	0	3
Cayman	5	0	0	0	0	0	0	0
Dominica	9	13	0	0	0	0	0	0
Grenada	2	5	0	0	0	0	0	0
Guyana	11	1	0	0	0	0	0	1
Jamaica	5788	3651	0	0	1	0	0	3
Montserrat	1	0	0	0	0	0	0	0
St. Kitts & Nevis	12	80	0	0	0	0	0	0
St. Lucia	10	30	0	0	0	0	0	7
St. Vincent & Grenadines	1	1	0	0	0	0	15	0
Suriname	0	35	0	0	0	0	0	0
Trinidad & Tobago	2170	550	0	0	0	0	7	7
Turks & Caicos	0	2	0	0	0	0	0	0
British Virgin Isl.	109	1	0	0	0	0	0	0
NORTH AMERICA	29,333	27,403	0	0	3	11	5,789	8,963
Bermuda	1	---	---	---	---	---	---	---
Canada*	11,139	876	---	---	3	7	1,759	4,775
USA*	18,193	26,527	---	---	0	4	4,030	4,188
TOTAL	154,498	218,700	1,344	1,045	1,050	859	33,641	32,039

--- Data not available

* Country which does not report cases of neonatal tetanus separately

3. Poliomyelitis Eradication

3.1 Surveillance Indicators

Of the 2,476 cases of AFP reported in the Region during 1990, 14 had been confirmed as polio by March 9, 1991, 60 as compatible, 2,155 had been discarded and 247 were still pending final classification. The Regional rate of AFP cases was 1.62 per 100,000 children under 15 years of age, with a minimum rate of 0.7 for the Latin Caribbean and a maximum of 2.3 for Central America.

POLIO ERADICATION SURVEILLANCE SYSTEM

Distribution Of Cases By Classification
Period: 90/01-90/52 By: Onset Level: Country

COUNTRY	NUMBER OF CASES				
	Reported	Confirmed	Compatible	Probable*	Discarded
Argentina	111	0	0	26	85
Bolivia	61	0	0	3	58
Brazil	901	0	16	105	780
CAREC	9	0	0	7	2
Chile	179	0	0	0	179
Colombia	203	2	8	11	2
Costa Rica	10	0	0	0	10
Cuba	23	0	0	9	14
Dominican	12	0	0	2	10
Ecuador	61	1	2	17	41
El Salvador	88	0	0	7	81
Guatemala	105	3	0	0	102
Haiti	20	0	0	10	10
Honduras	69	0	0	0	69
Mexico	338	6	8	22	302
Nicaragua	16	0	0	7	9
Panama	8	0	0	2	6
Paraguay	33	0	2	3	28
Peru	101	2	17	0	82
Uruguay	6	0	0	0	6
Venezuela	122	0	7	16	99
Total	**2476**	**14**	**60**	**247**	**2155**

*Still under investigation; final diagnosis not yet available.

In terms of surveillance indicators, 76% of all cases were reported within the first 15 days following onset of paralysis, and the variability was from 36% of all cases reported in the English-speaking Caribbean to 89% in the Central American Subregion.

Cases were confirmed in 19 (0.13%) of the 14,372 counties ("municipios") in the Region of the Americas.

The development of the negative reporting system for AFP has improved to the point of including all the Latin American countries of which approximately 70% were reporting regularly in 1990. Efforts are being made at present to develop this system within the countries of the English-speaking Caribbean.

Ten countries (Bolivia, Brazil, Colombia, Ecuador, El Salvador, Guatemala, Honduras, Mexico, Peru, and Venezuela) are carrying out mop-up activities that have covered 947 counties.

Summary of Mop-up Operations
Latin America, 1990 (Provisional data)

COUNTRY	Number of covered counties	Total population <5 years to cover	Total number of households visited	Total population <5 years vaccinated	%	Total population vaccinated
BOLIVIA	54	71 144	46 539	41 957	58	51 180
BRAZIL	N.A.	N.A.	N.A.	N.A.		N.A.
COLOMBIA	101	816 123	386 525	243 511	29	243 511
ECUADOR	140	639 267	581 091	443 224	69	469 345
EL SALVADOR	193	888 589	355 810	566 070	63	771 347
GUATEMALA	59	184 863	128 396	107 915	58	107 915
HONDURAS	290	833 267	134 796	673 984	80	673 984
MEXICO	N.A.	N.A.	N.A.	1 246 968		1 246 968
PERU	98	998 942	871 352	689 614	69	1 483 280
VENEZUELA	12	10 590	12 797	9 531	90	9 531
TOTAL	947	4 442 785	2 517 306	4 022 774	62	5 057 061

N.A.: Data not available

Following the recommendations made at the previous TAG meeting, efforts have been made to improve the timeliness of stool sample collections, although it is troubling to observe that during 1990 only 47% of AFP cases reported had samples taken within the first 15 days following onset of paralysis, and that these percentages ranged from 72% of all cases for Central America to 9% for the Latin Caribbean. As far as contact samples were concerned, only 26% of cases reported had stools taken from contacts.

3.2 Mexico

Six cases of paralytic poliomyelitis with onset in 1990 were confirmed in Mexico. As was the case with the 1988 cases, all were confirmed through isolation of P3 wild poliovirus from the feces and came from counties in the Pacific Coast, which are therefore considered infected: Guasave and Navolato in the state of Sinaloa, Tecomán in the state of Colima, and Tomatlán and Cihuatlán in Jalisco.

There are indications that wild poliovirus circulation is diminishing. The six cases confirmed in 1990 represent a reduction of over 50% when compared with the 13 cases confirmed in 1989. The geographic area of circulation has also decreased from 5% of counties infected in 1985 to 0.2% in 1990. Eight cases remained as compatible and one case was found to be vaccine-related.

The epidemiological surveillance system captured 341 cases of AFP under 15 years of age, representing a rate of 1.2 cases per 100,000 children under 15 years of age. One third of all cases were found through active searches carried out by regional epidemiologists who review all hospital records. This activity helped to increase the sensitivity of the system, but reveals that there are still weak links in routine reporting. The proportion of cases with samples and that of cases with contact samples (16% in 1990 and 60% in 1991) has increased considerably, but there is still a need to increase efforts in order to reduce the number of compatible cases.

Almost 60% of the confirmed cases had received a complete schedule of OPV vaccination. The presence of high coverage rates, along with the continued presence of wild poliovirus along the Pacific Coast, prompted investigations into the potency of the nationally produced vaccine. It was found not to comply with WHO quality standards and recommendations regarding formulation. In light of this, operations Sinaloa I and II and Pacific Coast were carried out. Due to the P3 cases reported from Guatemala, the Southern Border Operation also took place during 1990. All these involved house-to-house vaccinations as well as national campaigns, in which over 25 million doses of OPV (known to be of high potency) were administered to children under five years of age, obtaining coverages that averaged between 80 and 100%.

3.3 Central America

In spite of the advances made by the program in Central America, the presence of areas with OPV coverage below 80%, allowed for the introduction of wild type 3 poliovirus in Guatemala. This caused the whole Central American subregion to be declared in a state of "epidemiological emergency." The governments of Guatemala, Honduras, El Salvador and Nicaragua carried out house-to-house vaccinations of all children under five, retrospective investigations and active searches for cases in the areas at risk. Preliminary results indicate that 1,553,246 children have been vaccinated in 542 counties in the border areas and along the most important highways that may serve as transport medium for the wild virus. The vaccination activities along with the strengthening of epidemiological surveillance have succeeded in interrupting the occurrence of new cases. The last case confirmed was from San Juan Sacatepequez in Guatemala and had onset on September 9, 1990.

During 1990, Central America had a reporting rate of 2.3 cases of AFP per 100,000 children under 15 years of age, well above the Regional rate. Vaccination coverages have reached 80% for OPV in children under one year of age and the percentage of counties with coverages under 50% has decreased from 44% in 1988 to 18% in 1990. Ninety percent of the cases had stool samples taken within 15 days of onset of paralysis.

These indicators reflect considerable improvement in the epidemiological surveillance system, which has come about because of the commitment made by the governments to assign priority to EPI at all levels. It is nevertheless necessary that Nicaragua, Costa Rica, and Panama--which haven't seen cases of polio in years--strengthen surveillance of AFP. This must be done in order to prevent the reintroduction of the virus,

particularly in the border between Panama and Colombia, which constitutes an area at risk for reintroduction in light of the recent isolation of wild poliovirus from the Barranquilla and Cartagena areas.

3.4 Andean Countries

The goal of attaining polio eradication in the Andean Region has had mixed success. While vaccination coverages have improved in 1990 and the weekly system of negative notification of AFP has expanded dramatically, wild poliovirus continues to circulate. Of the 14 wild poliovirus isolated in the Region of the Americas in 1990, five or 36%, came from the Andean Region. The last case due to wild poliovirus in 1991 came from Colombia with date of onset January 3, 1991. The cases of confirmed polio appear to occur in areas or pockets that have extremely low coverages.

While no wild poliovirus has been isolated in Bolivia and Venezuela, there is concern because of the quality of their surveillance systems. The population of Bolivia does not have good access to health services; therefore, the weekly system of negative notification of AFP covers less than an acceptable level of the population. In Venezuela, because of the small percentage of cases of AFP that have stool specimens collected adequately (two taken less than two weeks after paralysis onset), the absence of documented wild poliovirus isolates does not prove the absence of transmission. Peru, Ecuador and Colombia also have areas of high risk due to poor negative reporting and low OPV coverage. Peru, in particular, is of concern because the political situation in the central highlands has caused curtailment of surveillance activities. In addition, the surveillance of flaccid paralysis in Peru has been severely handicapped because of the health strikes and a very poor economic situation that prevents children from obtaining the necessary health services even when a grave emergency such as polio occurs. In Colombia, despite a rather high overall level of coverage with OPV, there are large areas with low coverage levels. This may be a result of poor implementation of mop-up activities or other campaign measures. In Ecuador many high risk areas still exist, especially those areas where confirmed polio cases have occurred previously. Vaccine coverages with OPV also continue to be low in these areas.

Surveillance indicators for the Andean area indicate that only 42% of all cases of AFP have two samples collected adequately. Also, only 35% of these have contact specimens collected.

3.5 Brazil

Vaccination coverages among children under five years of age with the two national campaigns, remain at very high levels (93% for 1990, according to preliminary data).

The last cases confirmed by isolation of wild poliovirus (P1), occurred in 1989 in two states of the northeast. During 1990, 902 AFP cases were reported (1.5 per 100,000 under 15 population), 16 were classified as compatible, 795 were discarded, and 91 were still pending laboratory results or follow-up visit. No wild poliovirus has been isolated from the stool of cases or contacts since 1989.

The 16 compatible cases came from 10 of the 27 states in the country, eight from the northeast (risk area due to the isolation of wild P1 and P3 virus in 1987, 1988 and 1989), four from counties where wild virus was isolated in 1987 (two from Sao Paulo, one from Rio de Janeiro and one from Ceará).

Epidemiological surveillance indicators continue to improve when compared with previous years. Eighty-three percent of the cases were reported within the first 15 days, 61% had samples taken within the first 15 days of onset and 92% of the cases had at least one stool sample taken.

3.6 Southern Cone

Although wild poliovirus has not been isolated from the Southern Cone since 1984 and with the exception of Paraguay, coverage levels for OPV in children under one are above 85%, there is concern about the level of development of the epidemiological surveillance systems.

Argentina and Uruguay had weekly negative reporting below 65%, and although over 80% of the cases from the Southern Cone had stool samples taken, only 35% were adequate.

Bearing in mind that this subregion could lead the way to certification of eradication, it is of great importance that these countries strengthen their surveillance systems and direct their vaccination efforts to those areas with coverage below the national average since they contain populations at risk.

3.7 Caribbean

The surveillance of flaccid paralysis in the English-speaking Caribbean countries continues to improve albeit somewhat slowly. Jamaica, Guyana, and Trinidad have expanded their sentinel sites and as a result the number of notifications have increased. However, the overall rate for the Caribbean is 0.3, well below the gold standard of 1.0 per 100,000 children under 15 years of age.

Of more concern is the lack of opportunity in notification of cases of acute flaccid paralysis where only 36% are reported within 2 weeks of onset of paralysis and that only 13% of the stool samples permitted the isolation of an enterovirus, which probably reflects problems in the shipment of stool specimens.

TAG noted that more efforts must be made by the countries and territories of the English-speaking Caribbean to improve the reporting and investigation of all cases of flaccid paralysis in order to become eligible for certification.

3.8 North America

In Canada, there is no surveillance of flaccid paralysis as such. However, four components that contribute to the surveillance of poliomyelitis and flaccid paralysis can be identified. First, the surveillance of poliomyelitis through the Canadian Communicable Disease Surveillance System; second, the passive reporting system for vaccine-associated adverse events; third, a pediatric hospital network active surveillance system; and fourth, a review of all cases of Guillain-Barré Syndrome from hospital discharge databases. For all components but the first one, the driving force has been the need to monitor adverse vaccine reactions. The surveillance of flaccid paralysis is not seen as appropriate in Canada. No formal indicators are used, although the identification of vaccine-associated cases and the way these cases are investigated could be seen as an indicator.

Although tremendous progress has been achieved, it is recognized that Canada needs to maintain surveillance and to negotiate for better investigative procedures with the hospital association. Evaluation of immunization coverage needs to be improved so that vaccine coverage in all areas can be monitored and maintained at high levels. Monitoring adverse reactions to the vaccine will help maintain confidence in the program and vaccine acceptance. Should a case due to a wild poliovirus occur, immediate mop-up immunization of all unimmunized people would be initiated.

The principal surveillance system for poliomyelitis in the U.S. is a passive, epidemiologically-based system (established in 1935), in which patients of any age with acute flaccid paralysis that is both clinically and

epidemiologically compatible with poliomyelitis are reported through State Health Departments to CDC. This system has been supplemented by independent, laboratory-based surveillance (established in 1970) in which enterovirus isolates (both polio and non-polio) are reported voluntarily by State Health Departments to CDC. Excluding five patients who acquired their infection in other countries, no cases of indigenous wild poliovirus infection or illness have been identified since 1979, in spite of 80 cases of confirmed vaccine-associated polio and over 26,000 enterovirus isolates identified. The incidence of vaccine-associated polio has remained constant over the last 20 years, suggesting that the sensitivity of the surveillance systems has not changed appreciably. Currently, no information is collected routinely to examine the surveillance indicators monitored by PAHO.

Despite the absence of indigenously acquired wild poliovirus infection since 1979, more definitive proof remains the principal challenge to the program. Such proof will most likely be obtained from environmental monitoring and/or other highly sensitive laboratory techniques that can detect low-level poliovirus circulation in high risk populations, such as infants in large inner-city areas. Accordingly, the U.S. will continue to participate in the development and testing of such methods for application in the field. Collaborative relationships with appropriate institutions, including the U.S. Environmental Protection Agency, are currently in progress. In addition, efforts to stimulate surveillance through collaboration with pediatric neurologists is being considered.

3.9 Laboratory Network

The members of the laboratory network met on 10-11 March 1991 to discuss the results of their activities and the problems encountered to date.

Despite major contributions to the program, members of the lab network recognize that some aspects of the work need improvement. Of the eight labs in the network, those in Brazil and Mexico failed to report results back to the countries within the accepted 43 days from receipt of the specimens, for more than 60% of the samples. Procedures are being implemented to improve turn-around time for laboratory results.

It was agreed that significant problems continue with the international shipment of specimens. This has impeded the timely reporting and processing of specimens, severely restricted quality control testing, and quite possibly reduced the opportunities for virus isolation. Special shipping arrangements have been pursued to facilitate transport for a few laboratories; however, standardized shipping procedures, using special couriers, must be pursued more actively.

The following recommendations were made:

1. The laboratory should report stool sample results within:
   a) four weeks for cases with negative isolations;
   b) six weeks for cases which have had virus isolated from stools;
   c) intratypic differentiation should be completed within four weeks of receipt of isolates;
   d) these indicators should be monitored in the same fashion as the epidemiological surveillance indicators.

2. All poliovirus strains isolated from probable cases or their contacts should be characterized immediately by DNA probes. To meet this requirement:
   a) PCR should be used to confirm the identities of isolates tested by the probes;
   b) The genomic sequence analysis of all wild polio virus isolates should be performed in order to identify their probable endemic origins.

3. All wild poliovirus strains should be re-isolated from original specimens.

4. To optimize detection of wild poliovirus, special operational procedures and laboratory techniques should be used:

a) Epidemiologists should collect sufficient quantities (at least 10 gms) of stool material; rectal swabs have no place in the collection of stool samples.

b) Special isolation techniques (e.g., acid treatment and concentration of samples) should be critically evaluated for their capacity to increase recoveries of wild poliovirus.

c) Negative specimens from compatible cases will be examined by at least one additional laboratory. Distribution of such negative specimens to more than one additional laboratory has been difficult because of limited quantities of stool for analysis and increased problems with international specimen transport. In view of these experiences, we suggest reconsideration of the previous recommendation (recommendation 2.1.11, Final Report, Eighth Meeting of the TAG on EPI and Polio Eradication, Mexico, D.F., Mexico 1990) for the participation of two additional laboratories.

d) Special attention must be given to appropriate international transport of original clinical specimens which often have low virus titers. Prior notification of shipment to the reference laboratory should be made by the fastest way to help prevent delays in delivery.

5. Studies for the direct detection and identification of wild poliovirus in clinical specimens should be continued (e.g., use of elevated incubation temperatures during virus isolation, use of wild-genotype specific nucleic acid probes, use of PCR).

6. The program should continue to perform quality control measures, including molecular diagnostic techniques, for the isolation and identification of poliovirus in order to maintain a superior level of performance (90% identification rate of unknown test samples).

3.10 Certification Procedures

The procedures for certification of countries will include the demonstration of:

1. Absence of virologically confirmed indigenous transmission of wild poliovirus in all the Region of the Americas for a period of three years.

2. Absence of wild poliovirus in communities as demonstrated by environmental studies, particularly in high risk communities.

3. An efficient, accurate, operating surveillance system.

4. Measures are in place that ensure imported wild poliovirus will be dealt with in an aggressive, timely fashion.

Verification of these procedures will take place by committees at the country and regional level. Only after these reviews will the International Certification Commission (ICC) evaluate subregions for certification.

3.11 The Global Effort

Other Regions have made progress towards achieving polio eradication. A global policy largely based on the successful policies used in the Americas has been endorsed by the EPI Global Advisory Group (GAG) and its principles are now incorporated in Plans of Action in all polio-endemic countries.

By the end of 1990, it is estimated that almost 80% of all children in the world reaching the age of 12 months have received a full course of polio vaccine.

4. Elimination of Neonatal Tetanus

ANNUAL INCIDENCE OF NEONATAL TETANUS
REGION OF THE AMERICAS, 1985-1990

COUNTRY	Y E A R											
	1985		1986		1987		1988		1989		1990	
	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
Argentina	19	0.02	18	0.02	13	0.01	14	0.01	18	0.02	14	0.01
Bolivia	9	0.03	39	0.17	89	0.34	90	0.34	104	0.40	55	0.25
Brazil	609	0.13	497	0.12	464	0.11	403	0.09	397	0.08	386	0.06
Colombia	252	0.30	211	0.26	203	0.24	162	0.22	171	0.19	162	0.18
Dominican Rep.	12	0.05	8	0.03	7	0.03	33	0.14	13	0.05	12	0.05
Ecuador	91	0.36	74	0.29	80	0.31	126	0.59	58	0.27	88	0.34
El Salvador	52	0.32	39	0.21	26	0.14	33	0.66	28	0.54	25	0.48
Guatemala	17	0.05	8	0.02	24	0.08	29	0.10	113	0.38	50	0.16
Haiti	57	0.28	57	0.28	75	0.35	63	0.29	153	0.19	143	0.19
Honduras	20	0.10	24	0.14	21	0.12	4	0.02	20	0.11	39	0.23
Mexico	...	...	57	0.02	84	0.03	108	0.05	87	0.04	123	0.06
Nicaragua	30	0.27	28	0.22	32	0.24	26	0.17	17	0.10	15	0.09
Panama	12	0.16	12	0.16	7	0.09	7	0.09	7	0.09	5	0.06
Paraguay	76	0.69	59	0.52	59	0.51	54	0.46	37	0.30	38	0.30
Peru	72	0.18	89	0.22	138	0.33	143	0.34	183	0.44	93	0.24
Venezuela	70	0.14	59	0.11	52	0.09	51	0.09	41	0.08	28	0.05
TOTAL	1398	0.12	1279	0.10	1374	0.11	1346	0.11	1293	0.10	1173	0.09

...Data not available

Studies of Neonatal Tetanus (NNT) have been carried out in 16 endemic Latin American countries, and the resulting data indicate that 57% of known cases (1,276) occurred in 5% (606) of the "municipios," defined to be "at risk for NNT," where 11% (10 million) of the population of women of childbearing age live. In terms of the Region as a whole, the cases occurred in 21% of the "municipios."

Six-hundred forty-six cases were investigated, of which 29% (214) came from urban areas. In 18% (29) of the cases, the mother had prenatal care, indicating missed opportunities for vaccination of the mother. Cumulatively, since 1987, six of the 16 countries vaccinated 4,173 women of childbearing age (27% of the total in these countries). In 1990, 1,367,000 women of childbearing age of seven countries were vaccinated in high risk areas, reaching coverage of 21% of women of childbearing age in these areas.

NNT endemic countries are classified according to surveillance and control activities. Argentina, Brazil, Haiti, and Paraguay do not report NNT cases adequately.

5. Measles Control

In spite of increased overall vaccination coverages, measles outbreaks have continued to occur throughout the Region. This is due to the fact that except for Cuba, even those countries of the Americas with the highest immunization coverage have not achieved levels that would ensure the elimination of pockets of unimmunized children.

Efforts carried out in Cuba and the measles elimination initiative in the Caribbean will permit the development of effective strategies aimed at controlling/eliminating the disease.

The TAG recommends that strategies be directed at the group at highest risk; children under two years of age and the pockets of susceptibles. The low coverage rates that exist among these priority groups, continue to be the greatest impediment to the control of measles. Therefore, the administration of a second dose of measles vaccine is not recommended, since this strategy distracts both resources and the problem in general from those groups with the greatest risk of disease and death.

As the TAG has previously recommended, it will be necessary to improve the data base in order to monitor and improve the control strategies.

6. Hepatitis B Control

During 1990-1991, ongoing hepatitis B vaccination programs have been continued and amplified in Colombia, Brazil and Venezuela. In addition, vaccination programs have been initiated in several high hepatitis B virus endemic areas in Peru, and prenatal screening of pregnant women with vaccination of children born to hepatitis B virus carrier mothers has been started in Cuba and Honduras. The needs to increase the availability of hepatitis serologic testing and improve hepatitis surveillance in order to distinguish various types of acute hepatitis and determine causes of chronic liver disease, were reviewed.

The cost of hepatitis B vaccine remains very high compared to the costs of other vaccines. Considering the known magnitude of the hepatitis B problem, its use cannot presently be recommended except in selected areas of the few countries which now experience high endemicity. In such areas, efforts should be made to integrate hepatitis B vaccine into the EPI program. In other areas, vaccination of health care workers should be encouraged. To assist in better definition of problem areas, epidemiological, including serological surveys are warranted. Meanwhile, all possible efforts should be made through UNICEF and other procurement agencies to obtain vaccine at a substantially lower cost. The extent of recommended future use will be inversely related to vaccine cost.

7. Elimination of Missed Opportunities

From the many studies of missed opportunities to vaccinate conducted in the Americas, it is clear that the main causes are false contraindications to vaccinating children and women of childbearing age, followed by the attitude of the health personnel not to screen and offer systematically the vaccine needed. The next step is to take remedial action to ensure that all children or women of childbearing age who attend a health facility will be administered any dose of vaccine that is needed.