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1989-00030B

**Seventh Meeting of the Technical Advisory Group on EPI
and the Erradication of Poliomyelitis in the Americas**

**Cartagena, Colombia
11 to 14 July, 1989**

FINAL REPORT

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

1. INTRODUCTION

The Seventh Meeting of the PAHO Technical Advisory Group on EPI and Polio Eradication (TAG) was held 11-14 July 1989 in Cartagena, Colombia. Approximately 120 persons from 21 countries attended the meeting, including representatives of the Ministries of Health of the governments of the countries of the Region, the agencies funding the effort (AID, PAHO, Rotary International, UNICEF), WHO, the Japanese government, and the Task Force for Child Survival. Dr. Donald A. Henderson, president of the TAG, presided over the meeting; Dr. Alan Hinman served as Rapporteur; and Dr. Ciro de Quadros served as Secretary. All members of the TAG were present at the meeting. The Participants' list is included in Annex II.

Following a summary of the situation of the EPI and polio eradication efforts in the Region and a summary of global progress of the EPI, the meeting turned to a review of progress and problems in each of the countries in the Andean sub-region. Specific presentations were then made regarding the programs in Brazil, Mexico, Central America, Haiti, and the "Southern Cone". After this there was discussion of the laboratory situation in the Region, the accomplishments of various "mop-up" programs, the specificity and sensitivity of the case definitions in use, considerations of importations of polio from other Regions, and studies on appropriate formulations of oral poliovirus vaccine (OPV).

The discussion then turned to measles, focusing on progress toward measles elimination in Cuba and the resolution by countries of the English-speaking Caribbean to eliminate indigenous transmission of measles by 1995. Opportunities missed and opportunities gained to provide immunizations, the current situation with neonatal tetanus, the use of the polio eradication program to provide cost estimates for EPI, and on remaining relevant issues for achieving eradication of polio were also discussed.

As has been the case at previous meetings, the quantity of information available, the quality of presentations, and the obvious accomplishments of individual programs clearly demonstrated the remarkable progress that has been made in the Americas in implementing the EPI and in reaching the target of polio eradication.

2. CONCLUSIONS AND RECOMMENDATIONS

- 2.1. Considerable strides have been made since the last TAG meeting (held in Buenos Aires, Argentina, in November 1988) toward achieving the goal of Regional eradication of poliomyelitis. Record high vaccine coverage levels are being achieved and sustained with OPV (the Region-wide estimate for OPV-3 coverage for children below one year of age is approximately 80%), surveillance systems have been strengthened

substantially in virtually all countries, and morbidity has decreased to very low levels. The efforts to eradicate polio have enhanced the development of the entire EPI and coverage levels with all EPI antigens have reached the highest levels ever - more than 60% for the entire Region. Fewer than 1% of all countries in the Region have reported confirmed cases of polio during the first 26 epidemiological weeks of 1989. Social and political commitment to the eradication goal remains at very high levels and external financial support from donor agencies such as PAHO, USAID, UNICEF, IADB, Rotary International, and the Canadian Public Health Association remains strong. The recent hemispheric announcement of a reward of US\$100 to the person reporting a case of paralysis caused by wild virus and to the health worker investigating the case is a tangible manifestation of the progress that has been made.

The countries of the Region and all participating agencies and individuals can be justifiably proud of these achievements. Nonetheless, the fact that less than 18 months remain before the target date for eradication makes it imperative that all countries act quickly to remove the remaining impediments. The problem now is to maintain the impressive gains that have been made and still make the additional efforts required to reach the target.

The obstacles ahead are of great magnitude, especially in countries where civil disturbances are present and in others that have only recently intensified their surveillance efforts. Although all countries must intensify their efforts, the TAG is particularly concerned about progress in Haiti, Honduras, Mexico, Peru, and Venezuela.

- 2.2. The progress achieved to date gives testimony to the validity of the basic program strategies - achievement and maintenance of high immunization levels (through the reinforcement of regular vaccination services and the use, in selected countries, of National Vaccination Days involving mass mobilization and community participation), active surveillance, and aggressive response (including "mop-up" operations) to the occurrence of cases - and to the continuing political will of member countries.
- 2.3. The quality and quantity of information presented by national programs is a tangible demonstration of the progress made in a very short time. Use of standardized tables and figures by all countries would facilitate further analysis of data at the Regional level.
- 2.4. Major emphasis has been placed on strengthening surveillance systems both for disease and program monitoring. This is reflected in the striking improvements in speed of

investigation of suspected cases and implementation of control measures. It now appears that in some areas the quality of surveillance is disproportionate to the quality of immunization services. It must not be forgotten that high immunization levels in all districts/counties are essential for the achievement of polio eradication. The necessity for maintaining very high levels of immunization coverage is underscored by the likelihood of importation of wild virus as shown by recent experience in Canada and the United States.

- 2.5. Review of surveillance experience in the Region indicates that countries should expect a "background" rate of approximately 1 case of flaccid paralysis for every 100,000 inhabitants less than 15 years of age. This index can be useful in assessing the adequacy of surveillance.
- 2.6. As paralysis due to wild poliovirus becomes less common it becomes ever more important to have in place reliable and rapid laboratory support systems for diagnosis. Despite concerted efforts and major progress over the past several years, such support is not yet optimal in all parts of the Region. It is critical to take immediately whatever steps are necessary to ensure the rapid submission of properly obtained and viable samples to the laboratory, their prompt and accurate analysis, and the notification of results (including characterization of virus isolates as to wild or vaccine-like) back to the field as quickly as possible but no later than eight weeks after receipt of the sample at the first laboratory handling the sample. Special measures are required to develop standardized methods for receiving and handling samples, for reporting results, and for week-by-week monitoring of progress. The TAG appreciates the initial steps taken and urges that they be pursued expeditiously with continued team work among epidemiologists, clinicians, and laboratory scientists.

Review of the laboratory situation in the Region has led to the development of a number of recommendations which should prove helpful and which are endorsed by TAG (see Section 4). One of the most important of these recommendations is that serologic testing be abandoned as a means of diagnosing polio. This step is recommended because current experience indicates that serology has rarely been useful in clarifying questionable diagnoses. In addition, it is difficult to interpret results in the face of widespread vaccination between collection of the first and second samples and there has been a low rate of seroconversion even in persons with permanent sequelae and virus isolation. Furthermore, it is often difficult to obtain adequate samples. Abandonment of serology will allow more emphasis to be placed in the field on proper collection and shipment of opportune and adequate

stool samples and in the laboratory will allow more prompt attention to isolation attempts.

- 2.7. When paralytic poliomyelitis is common, detection of cases of paralysis is an adequate means for detecting circulation of wild poliovirus. As it becomes less common, it becomes important to develop direct surveillance for the presence of wild virus in the environment. Recent developments in technology (e.g., polymerase chain reaction technology) coupled with more traditional techniques of environmental sewage and stool sampling, give great promise of allowing direct monitoring of the presence of wild poliovirus, even in the presence of large concentrations of circulating vaccine viruses. Evaluation of this approach should proceed at a rapid pace in a limited number of demonstration areas to allow assessment of its overall role in the program.
- 2.8. National Vaccination Days in which all EPI vaccines are not administered represent "missed opportunities" for vaccination. They should become "opportunities taken" to provide the full range of vaccines, just as should all other contacts with the health care system.
- 2.9. In the past four months each country has identified the counties which have had cases of polio in the preceding three years. More than 750 counties have been so identified for "mop-up" operations involving two rounds of house-to-house vaccination. With major international and local support from Rotary International and with extensive community mobilization, 283 of these counties have already completed the "mop-up". These efforts should be continued and expanded as a major tool in reaching the target of eradication.
- 2.10 Review of confirmed cases of polio in Brazil has suggested that some refinements in case definition could improve the specificity of the definition without inordinate loss of sensitivity. This could prove useful in focusing investigations in the future. This effort should be expanded to other countries to determine if any changes in the case definition are warranted.
- 2.11 Several countries have identified areas of high risk for the occurrence of neonatal tetanus and have implemented vaccination programs for women of child-bearing age in these risk areas. Every country should determine whether there are such high-risk areas and immediately add tetanus toxoid for women of child-bearing age as a component of National Vaccination Days in these areas as well as ensuring that tetanus toxoid is administered to these women during any contact with the health services.

2.12 The goal of the English-speaking Caribbean countries of eliminating the indigenous transmission of measles by 1995 represents an important and ambitious "next step" in improving health through immunization. It must be recognized that the target is an intermediate one (on the road to eradication) and that it will be essential to maintain universal immunization and aggressive surveillance even after its attainment because of the inevitability of importation of measles virus with likely subsequent explosive spread among remaining susceptibles. Even this "intermediate" target presently seems feasible only in locations such as the Caribbean islands where immunization levels are currently high and where insularity lessens the threat of importation. Experience gained during this initiative will be vital to the development of future plans for measles elimination in continental countries within the Region.

With regard to the measles elimination initiative in the English-speaking Caribbean, several general recommendations can be made as guidance in developing more specific plans:

- a) Initial mass vaccination or revaccination of all persons 12 months to 15 years old (regardless of previous immunization history), followed by routine vaccination is appropriate;
- b) Use of MMR vaccine rather than single antigen measles vaccine to bring additional health benefits to these countries.
- c) Experience in the United States and other countries indicates that measles transmission can be sustained even in areas with high immunization coverage among the remaining unvaccinated individuals and the small proportion of primary vaccine failures. Consequently, following the initial mass campaigns, a routine two-dose schedule is recommended, with the first dose given at 12 to 15 months and the second at the time of entry to kindergarten or school.
- d) To provide immediate protection to those at highest risk of rubella in pregnancy, mass vaccination of women aged 15-34 with single antigen rubella vaccine is recommended. The impact on transmission of rubella virus would be enhanced if men aged 15-34 also were vaccinated and the TAG therefore recommends this.
- e) As in the case of the National Vaccination Days for polio eradication, the mass MMR vaccination strategy presents an opportunity which should be "taken" to assure full protection of target populations against all EPI diseases. Mass vaccination of adults may present a

special opportunity to administer tetanus toxoid in areas where neonatal (or adult) tetanus remains a problem.

- f) "Certification" of elimination is not recommended because it might convey a false sense of security and there is a continuing risk of introduction and transmission of measles.

2.13 Increasing experience with measles vaccination programs in the Region (and in other parts of the world) demonstrates that partial coverage of a population with measles vaccine not only protects the individuals vaccinated but also alters the epidemiology of the disease so that epidemic cycles become spread out (e.g., from every 2 years to every 5 years). Until transmission is permanently interrupted, most countries can expect periodic outbreaks of measles. As overall measles incidence will have been substantially decreased, there is the risk that these outbreaks may attract undue attention. It is important to anticipate that these outbreaks will occur and to investigate them to assure that individual protection against measles (vaccine efficacy) remains high. It also must be remembered that, although individual outbreaks may be dramatic, the immunization program does provide significant cumulative reduction in the impact of measles, particularly in the number of deaths.

2.14 Given the rapid pace of events and the imminence of the target date, TAG proposes to meet again early in the coming year. At that meeting, particular emphasis will be placed on progress made in providing laboratory support, monitoring of coverage by county, performance of the negative reporting system, completion and evaluation of "mop-up" operations, results from the environmental monitoring pilot program, further information on the pattern of circulation of wild poliovirus in the Region, further information on possible refinements of the case definition, Regional/country plans of action for the coming months, and further progress in control of measles and neonatal tetanus.

3. COUNTRY REPORTS

3.1 ANDEAN REGION

Between 1988 and 1989, all the countries of the Andean Region improved their coverage data for children under 1 year of age. In general terms, the coverage with OPV varied from 50% (Bolivia) and 92% (Colombia). The coverage rates of Peru, Ecuador and Venezuela are 37%, 57%, and 69%, respectively. Coverage for DPT3 and measles is lower, with the exception of Venezuela (88%).

From 1988 until June 1989, the number of cases notified has remained unchanged, with the exception of Colombia and Ecuador, where more probable cases have been notified than in the previous

year. There is also a larger number of discarded cases, with respect to the total number notified.

The total number of cases confirmed in the Subregion is 129 for 1988, and 32 to date in 1989. This probably indicates that in 1989 there were fewer cases than the previous year. The highest number of cases was registered in Peru (61 for 1988 and 10 for 1989), followed by Colombia (36 in 1988 and 7 in 1989). Venezuela, Ecuador and Bolivia had 31, 10, and 2 cases respectively in 1988 (4, 9, and 2 for 1989).

The greater part of confirmed cases are found in or near the large cities:

Caracas	11 cases
Maracaibo	10 cases
Medellín	5 cases
Cartagena	4 cases
Bogotá	5 cases
Piura	6 cases
Lima	21 cases
Cochabamba	2 cases
Guayaquil	6 cases

The CDC laboratory was able to confirm 8 cases with isolates and as a result to confirm the circulation of wild poliovirus in Maracaibo (2 cases of P1), Medellín (P3), Ciénaga (P3), Piura (P1) and Lima (P1). In addition, wild P1 was isolated in two cases in the Peruvian Amazon.

Laboratory data is as yet incomplete for cases confirmed in the last months of 1988 and in 1989. This could explain the absence of wild poliovirus in 1989.

Transmission most likely was in existence on the borders of Venezuela (Zulia) and Colombia (La Guajira); and of Ecuador (Guayaquil) and Peru (Lima). There also is the possibility that there was transmission in the Amazon Region of Ecuador, Peru, and Colombia.

In general, the cases confirmed in 1989 were from the same provinces and cities as in 1988. The majority of cases are children under five years of age, with incomplete vaccination.

The epidemiological surveillance indicators have improved greatly. More than 70% of confirmed cases have stool samples, although around 50% of these samples were taken later than eight days after the first signs of paralysis.

Control measures were taken only in a minority of the cases, but progress has been made in 1989.

All the countries have realized Mop-Up operations in addition to National Vaccination Days. In all, 180 counties have performed house-to-house vaccination during which more than 1,800,000 children under five years of age (approximately 20% of the total child population) were vaccinated.

A total of 870 weekly negative reporting centers have been selected among all the regions (Bolivia 8, Peru 40, Ecuador 120, Colombia 161 y Venezuela 384). Approximately 50% of negative reporting is now in place.

3.2 MEXICO

During 1989, Mexico has held two National Vaccination Campaigns (NVC). The success of the NVCs and the permanent program have resulted in very satisfactory vaccine coverage in children under five years of age: 98.5% for OPV, 67% for DPT, 81% for BCG and 83% for measles.

Up to epidemiological week 26 of 1989, 75 cases had been notified, of which eight cases were confirmed (11%) and 29 discarded (39%). Seventy-seven per cent of the cases notified were children under the age of five years, and 27% under the age of one year. Vaccination schedules were incomplete in 76% of the cases. The geographical distribution of the cases shows a concentration in the central region of the country (32 cases notified, or 43%), followed by the region of the northern Pacific (23%) and the southern Pacific region (15%).

Most of the eight confirmed cases had not completed their vaccination schedule (63%), and all were under five years of age. Two cases were confirmed based solely on clinical criteria and six by clinical and laboratory results.

With regard to the laboratory results, there have been ten cases with isolations, four with P3, two with P2, two with P1 and combinations of P1 and P2 and P1 and P3. Of the confirmed cases, four had P3 isolations, one P1P3 and one P1P2. The typing done by the CDC showed that two P3 were wild and one P3 is vaccine-related. Three of the cases with P3 (including the two wild viruses) are from the state of Sinaloa in the northern Pacific region. The other with P3 is from the Sonora state, from the same region, and is vaccine-related.

During this year, 61.3% of the cases were notified within 15 days of onset. Eighty-seven per cent of the cases had stool samples and 51.7% were taken within eight days of onset. Nevertheless, 88.9% were taken within eight days of notification. Containment vaccination was done in 90% of the cases. As far as notification, 44.5% of the 32 states notified on a regular basis. For this year, Mexico has established a Network of Hospitals which includes 133 of the hospitals in the country.

Ten regional epidemiologists have been contracted for Mop-Up activities, who are assigned to eight states of the republic. Their responsibilities include case research, establishment of Regional Committees for polio surveillance and the hospital networks, and to carry out house-to-house mop-up vaccination. During the month of April, house-to-house vaccination was done in four localities that had confirmed cases in 1989. In May the same was done in one locality. In all, 17,440 children were vaccinated in 12 states of the Republic. House-to-house mop-up will be included in the 14 counties reporting confirmed cases in 1988 and the five from 1989. The Secretary of Health will also do state-wide mop-up in the state of Sinaloa, where two P3 wild isolates were found.

3.3 CENTRAL AMERICA

In the countries of El Salvador, Guatemala, Honduras and Nicaragua, 132 probable cases had been reported up to June 1989, of which only four (3%) were confirmed.

Table 1 shows the increase in the notification of cases, which in turn shows the intensification of the epidemiological surveillance in relation to the previous year. In addition, four countries present coverage data for the first trimester of 1989.

TABLE 1

	CASES NOTIFIED				COVERAGE	
	1988		1989		1988	1989
	Prob.	Cont.	Prob.	Cont.		
El Salvador	39	9	28	1	62%	20%
Guatemala	84	34	84	1	59%	26.7%
Honduras	11.6	6	39	2	74%	79.5%
Nicaragua	7	0	6	0	83%	89%
Costa Rica	N/A	0	N/A	0	86.4%	N/A
Panama	N/A	0	N/A	0	73%	N/A
Belize	N/A	N/A	N/A	N/A	73%	N/A
TOTAL	146	49	137	4	68%	--

Nicaragua, Costa Rica and Panama have had no cases of poliomyelitis to date.

No wild poliovirus has been isolated in Central America since 1988. Criteria for confirming cases has been based, primarily, on the presence of sequelae and on electromiographic diagnosis.

In all the countries of the sub-Region, interdisciplinary technical committees have been formed, made up of pediatric neurologists and epidemiologists for discussion of the cases.

To date this year, only 0.3% of the counties, out of a total of 1,070 existing in the sub-Region, are infected.

In the four countries reporting probable cases of polio, negative reporting is being implemented, and almost 100% realization of control measures has been reached.

The use of stool samples in probable cases has increased, primarily in El Salvador (88%), Honduras (100%), and Guatemala (90%).

National Vaccination Days were held this year in Honduras, El Salvador, Guatemala, and Nicaragua. OPV, DPT, and measles vaccines were administered, as well as TT vaccine in some high-risk areas.

Countries with counties at risk of polio have programmed and executed special activities, such as "Mop-up" operations. These have given coverage rates higher than 80%, in countries where they have been held.

Table 2 shows the progress in the compliance of agreements made at the border meetings. The III Central American Border Meeting on the Eradication of Poliomyelitis and Review of the EPI was held in February of this year, in Guatemala City. Three points were made for progress in the sub-Region. They are:

- a) Decentralization of the local programming actions;
- b) Elimination of missed opportunities for vaccination;
- c) Intensification of epidemiological surveillance.

Another important event was the First Central American Meeting of Pediatric Neurologists for the Eradication of Poliomyelitis, which permits the standardization of clinical criteria for classification of cases.

TABLE 2
Compliance and percent of regional compliance with agreements made at the border meetings, Central America, 1988-1989

INDICATOR	% 1988	% 1989
Coverage by County	50	83
Vaccination Campaigns	66	66
Special Activities	100	100
Samples to INCAP	66	66
Potency Test	66	50
Dosage OPV to Newborns	66	83
Missed Opportunities	66	66
Rotary Work	100	100
Quarterly Border Meetings	0	0
Intersectoral Participation	100	100
Social Communication	66	100
Cold Chain Evaluation	16	33
Operation "Mop-Up"	--	66

3.4 BRAZIL

In 1988, Brazil's immunization coverage among children <1 year of age was 67% for BCG, 54% for DPT3 and 60% for measles. Oral poliovaccine coverage among children <5 years of age following the second national vaccination campaign was 93%.

As of week 26 of 1989, a total of 385 cases of poliomyelitis had been notified to the Ministry of Health, of which 19 (5%) were confirmed, 187 (49%) were discarded, and 179 (46%) were still under investigation. In week 26 of 1988, 15% of the 383 cases notified had been confirmed.

The incidence of confirmed poliomyelitis fell below 0.1/100,000 inhabitants in 1988, following a sustained decline since the 1986 type 3 poliomyelitis epidemic. Less than 2.5% of Brazil's 4,500 counties had confirmed cases in 1988.

The majority of cases notified and confirmed, both in 1988 and up to week 26 in 1989, were residents of the nine states of the Northeast Region of the country. Twenty-six of the 28 wild polioviruses isolated in 1988, most of which were type 1, came from Northeast Region cases. A further 165 vaccine-like viruses were isolated from cases located in all regions of the country. As of week 26 of 1989, only five viruses had been isolated, one of which was vaccine-like, and four of which remained to be characterized.

Studies of polio antibodies in first sera collected from adequately vaccinated discarded cases revealed that seroprevalence, especially against type 3, increased in 1988 compared with 1987.

There was a modest increase in the number of polio cases confirmed in adequately vaccinated children in 1988. Assuming no change in vaccine efficacy, real coverage has therefore probably increased between 1987 and 1988. Mop-up operations were carried out in 157 counties in Brazil during the first weeks of June, 1989, during which 727,000 (93%) of 780,000 children <5 years targeted were vaccinated, partly by house-to-house strategy, and partly at vaccination posts.

A structure of 1,825 polio notification posts has been organized in Brazil. As of week 26 of 1989, 1,375 (75%) of those posts were notifying on a weekly basis. Notification of 64% of polio cases occurred in <8 days following the onset of motor deficit. In 86% of cases, a fecal sample was collected. Fifty percent of fecal samples were collected <8 days following onset.

Laboratory support continues to be critical to the eradication program in Brazil. Whereas the technical quality of lab support is high, as confirmed by quality control testing, timeliness of results remains a serious problem. Over 2,500 fecal samples were processed during 1988, a considerable increase over 1987. Results of 30% of these examinations were provided in <30 days, a further

30% in 30-45 days, and the remaining 40% in >45 days. Delays are caused by both technical and operational problems. Laboratories in Sao Paulo and Porto Alegre were consulted concerning their routine environmental sampling programs, designed to identify the presence of enterovirus among other pathogens.

3.5 SOUTHERN CONE

EPI vaccination coverage in the four countries of the "Southern Cone" (Argentina, Chile, Paraguay and Uruguay) exceeded 80% in 1988 for all antigens, except in Paraguay (Table 1).

TABLE 1. COVERAGE, CHILDREN <1 YEARS, 1988

	ARG	CHI	PAR	URU	TOTAL
BCG	100%	98%	56%	98%	95%
DPT3	80%	96%	56%	85%	82%
OPV3	91%	96%	84%*	85%	91%
MEASLES	88%	95%	63%	81%	86%

*2nd national vaccination campaign

In 1989, to date, 75 cases of polio were notified to the four Ministries of Health, of which 1 (1%) was confirmed, 40 (53%) were discarded, and 34 (45%) were still under investigation (Table 2).

TABLE 2. CASES NOTIFIED, 1989

	ARG	CHI	PAR	URU	TOTAL
week ending	21	26	22	23	
CONFIRMED	0	0	0	1	1
DISCARDED	18	13	8	1	40
PROBABLE	10	24	0	0	34
TOTAL	28	37	8	2	75

Thirty-four percent of notified cases were <5 years of age (Table 3), and 90% had a history of <3 doses of OPV (Table 4).

TABLE 3. PERCENTAGE NOTIFIED CASES <5 YEARS, 1989

	ARG	CHI	PAR	URU	TOTAL
	NA	35	25	100	34

TABLE 4. PERCENTAGE NOTIFIED CASES WITH <3 DOSES OPV, 1989

ARG	CHI	PAR	URU	TOTAL
NA	97	33	100	90

Only one virus has been isolated from the 75 cases investigated to date in the region; that was a vaccine virus from a case in Uruguay (Table 5).

TABLE 5. VIRUSES ISOLATED, 1989

VIRUS	ARG	CHI	PAR	URU	TOTAL
WILD	NA	0	0	0	0
VACCINE-LIKE	NA	0	0	1	1
UNDETERMINED	NA	0	0	0	0
TOTAL	NA	0	0	1	1

Epidemiologic surveillance indicators are presented in summary form in Table 6.

TABLE 6. SURVEILLANCE INDICATORS, 1988 CASES

	% onset/ notifi- cation <8 days	% with feces collected	% onset/ feces <8 days	% with contain- ment	notifi- cation posts	% reporting weekly
ARG	NA	NA	NA	NA	NA	NA
CHI	100	100	100	0	26	100
PAR	59	88	47	0	164	80
URU	50	100	50	100	19	79
TOTAL					209	82

3.6 HAITI

From 1989 to 1985, vaccination coverage for children under 1 year of age showed a tendency which reflected some of the problems which were confronting the national health system.

From 1985 to 1988, thanks to the different strategies of intervention utilized at the EPI level (especially the national vaccination campaigns held for the first time in 1988), the vaccination coverage in children under 1 year of age reached an acceptable level.

TABLE 8
Coverage Tendencies in Children under 1
Year of Age for EPI Vaccines from 1985 to 1988
(Percentage)

Vaccines	1980	1981	1982	1983	1984	1985	1986	1987	1988
DPT	7.8	13.6	12.3	8.6	13.4	23.2	26.5	29.5	54.4
POLIO	3.3	4.3	11.0	8.0	15.7	22.2	30.7	29.5	54.1
BCG	-	60.0	58.0	61.0	69.0	70.0	74.9	46.3	-
MEASLES	-	-	-	-	7.8	-	21.7	23.9	62.8

With regard to epidemiological surveillance, in May 1989, the Coordination of Priority Programs Unit of the Ministry of Public Health created an Epidemiological Surveillance Service, which will be responsible, in particular, for epidemiological surveillance of poliomyelitis.

TABLE 9
EPIDEMIOLOGICAL SURVEILLANCE INDICATORS

	1988	1989
PERCENTAGE DATE OF ONSET AND NOTIFICATION < 15 DAYS	0%	33%
PERCENTAGE OF CASES NOTIFIED WITH STOOL SAMPLE	18%	85%
PERCENTAGE INTERVAL DATE OF ONSET AND COLLECTION OF STOOL SAMPLES < 8 DIAS	0%	0%
PERCENTAGE PROBABLE CASES FOLLOWED WITH CONTAINMENT MEASURES	8%	12%
NUMBER OF UNITS WHICH SHOULD NOTIFY WEEKLY	22%	71%
PERCENTAGE OF UNITS WHICH NOTIFY WEEKLY	0%	30%
NUMBER OF Counties WITH "MOP-UP" OPERATIONS	0%	0%

The number of cases notified up to June was six, of which only one has been confirmed by epidemiological criteria (sequela >60 days) and for the first time, the stool samples have been taken for each one of them. No Poliovirus has been isolated. Only enterovirus has been isolated, which are being typed at the Centers for Disease Control.

Negative reporting has been implemented in the entire country and the list of sentinel centers has increased to 71, with at least one person responsible in each center.

Analysis of vaccine coverage by counties has begun in a systematic way, especially for the six districts which in 1988 had less than 50% coverage, i.e. Saint Marc, Port-de-Paix, Cap Haitien, Gonaives, Croix des Bouquets, Port-Au-Prince.

4. LABORATORY NETWORK

Representatives of the laboratories in the Polio Eradication Program met before the TAG meeting in Cartagena, Colombia. They reviewed the recommendations made during their meeting held before the Sixth TAG in November 1988 in Buenos Aires, Argentina and heard reports presented by each of one of the laboratories represented. The data presented are summarized in Tables 1, 2, and 3. It is noteworthy that P1 and P3 strains are still being isolated in the Region.

Discussions on the maintenance of quality control aimed at measuring the precision of the technical work being carried out, centered on the degree of sensitivity required to perform virus isolation and identification. They agreed that quality control should continue to be performed under the direction of PAHO and stressed the problems posed by laboratory contamination of the samples, both at the cell culture and sample handling levels.

The usefulness of serology as a polio diagnostic tool was questioned in light of the fact that the populations of the Region are increasingly being subjected to the influence of massive vaccination campaigns that use the Sabin virus. These not only have the impact of inundating the populations with the vaccine virus, but also affect the immunologic status of the children. In light of this, they agreed to push serology to a secondary level in terms of its usefulness as a diagnostic tool and to not consider it a priority test within the Eradication Program.

The group also discussed the benefits that will possibly be afforded by polymerase chain reaction. Currently, tests are being carried out in CDC to evaluate the feasibility of introducing this process in the laboratories of the program.

Given the success that the laboratories of Argentina and Mexico have had with the fecal concentration procedures, a recommendation was made that any of these techniques should be used with all samples taken from clinically confirmed cases that have been found to be negative with routine procedures, as long as they were taken within the first 15 days following onset of paralysis.

Since the expectation is that wild virus isolations will diminish, it will be necessary to search for them in other places like the stools of contacts of cases and the sewage. The European, Latin American and American experiences were reviewed and the group established that wild poliovirus isolation from sewage has a predictive value in terms of future outbreaks.

Finally, the group stressed the importance of obtaining stool samples during the first days following onset of paralysis and identifying them in terms of origin, date of onset, date sample taken, date of last OPV and preliminary clinical diagnosis. Also, the urgent need to have all laboratories supplied with standardized reagents was agreed upon.

Recommendations

1. PAHO should stimulate and support the development and implementation of methods to detect wild poliovirus from environmental samples.
2. Serologic diagnosis of poliomyelitis should be eliminated since interpretation of results is being hampered by the immunologic changes that are taking place in the children of the Region as a result of the widespread OPV vaccinations

being carried out, the operational difficulties it presents, and the time that is invested in this procedure.

3. The laboratories should be supplied with the reagents and materials needed to carry out polio diagnosis. They should also have the human resources necessary to carry out this task.
4. The Program should define clinical and epidemiologic criteria that will aid in establishing priorities for processing the samples received by the regional laboratories and the CDC.
5. The laboratory should report results of stool samples analyses within four weeks for negative cultures and six weeks for positive cultures.
6. All polio strains isolated from probable cases of their contacts, should immediately be characterized by ADN probes.
7. Reisolation should be attempted with all wild strains isolated from confirmed cases.
8. Virus isolation by means of concentration techniques (i.e., ultracentrifuge at 150,000 G for two hours) should be attempted from all negative samples of confirmed cases. Epidemiologists are requested to collect a sufficient amount of sample to perform reisolation, if necessary.
9. Continue with studies aimed at identifying the wild virus in pools that also have vaccine-virus (high EGT, acid treatment, PCR).
10. The laboratory will only analyze samples from contacts when the sample from the confirmed index case is found to be negative for poliovirus. Pool from up to five close contacts will be acceptable to attempt to isolate the virus.
11. Continue with the quality control program for poliovirus isolation and identification (i.e. coded samples) in order to maintain a quality level of over 90% of correct results.
12. The laboratories must continue to implement adequate measures to prevent intralaboratory viral contamination.
13. All workers of the laboratories included in the Program must be completely immunized against polio and hepatitis B, and PAHO should provide the necessary vaccines.

Table 1. Intratypical Differentiation of Poliovirus Strains Isolated from Confirmed Cases in the Americas.

(17)	1988 (63)			1	9	8	9
	W	V	P	W	V	P	
MEXICO	3	1	-	2	1	3	
GUATEMALA	-	3	-	-	1	-	
HONDURAS	-	-	-	-	-	1	
COLOMBIA	2	4	-	-	-	3	
PERU	4	4	10	-	-	-	
VENEZUELA	2	3	1	-	-	1	
BRAZIL	19	5	-	-	1	4	
ARGENTINA	-	2	-	-	-	-	
TOTAL	30	22	11	2	3	12	

(W = Wild, V = Vaccine-like, P = Pending)

Table 2. Number of Stool Samples Analyzed in the Americas in 1988 and 1989

	1988	1989 1ST SEMESTER
MEXICO	251	71 (142)
CENTRAL AMERICA	208	157 (314)
ANDEAN	496	270 (540)

() PROJECTION FOR THE YEAR

**TABLE 12
PROPOSED SAMPLE
DATA FORM**

PATIENT NAME _____
 PROGRAM No. _____ CASE _____ CONTACT _____
 LOCATION (COUNTY, STATE, COUNTRY) _____
 CLINICAL DIAGNOSIS _____
 DATE OF ONSET (CASE) _____
 DATES OF SAMPLES F1 _____ F2 _____
 NUMBER OF OPV DOSES (PATIENT) _____
 DATE OF LAST DOSE (PATIENT) _____
 DATE OF CONTAINMENT MEASURES _____
 COMMENTS _____
 DATE SAMPLES SENT TO LABORATORY _____

LABORATORY 1

DATE SAMPLES RECEIVED _____
 CONDITION OF SAMPLES _____ GOOD _____ BAD _____
 VIRUS ISOLATION F1 _____ F2 _____
 DATE REPORTED _____
 SAMPLES SENT TO REFERENCE LABORATORY _____
 ISOLATES FROM F1 _____ F2 _____
 COMMENTS _____
 DATE REFERRED TO REFERENCE LABORATORY _____

LABORATORY 2 (REFERENCE LABORATORY)

DATE SAMPLES RECEIVED _____
 CONDITION OF SAMPLES _____ GOOD _____ BAD _____
 VIRUS IDENTIFICATION I1 _____ I2 _____
 COMMENTS _____
 DATE REPORTED _____

5. GENERAL DISCUSSIONS

5.1 FLACCID PARALYSIS

In view of the ever-increasing number of cases notified of flaccid paralysis, it is suggested that the definition of probable cases include that the term refers to "all cases of predominantly asymmetric, proximal, acute flaccid paralysis occurring in children under five years of age.

It is insisted that the cases with clinical and para-clinical data that support the diagnosis of another neurologic entity, are not classified as polio only because death occurred. In cases where death occurs, it is recommended that an autopsy be performed whenever possible or in its absence, take a bone marrow sample,

biopsy of the peripheral nerve of the affected limb, cerebrospinal fluid, and stool sample.

Following the recommendation at the Central American Pediatric Neurologists' Meeting, we suggest the standardization of the collection of clinical history data and in the neurologic clinical examination.

The need for sub-Regional meetings with neurologists and epidemiologists was emphasized, such as the meeting held in Central America, to organize multidisciplinary committees, hold workshops for neurological studies, field visits, evaluation and follow-up of patients, etc.

Since the majority of cases of Guillain-Barre Syndrome have sequela at 60 days, it is desirable that they be followed-up by a Pediatric Neurologist (for at least up to 12 months). It is necessary that all paralytic sequelae which is predominantly asymmetric, flaccid, proximal and atrophic be considered to be compatible with polio, since paralytic polio always leaves sequelae. The usefulness of the neurophysiological exams should take priority for the cases of doubtful diagnosis.

5.2 OPERATION "MOP-UP"

Bolivia, Brazil, Ecuador, Colombia, El Salvador, Guatemala, Peru, Honduras, Haiti, Mexico and Venezuela have carried out mop-up operations in 283 of the 742 counties infected. The preliminary data show that approximately 1,700,000 children have received one dose of polio vaccine during the first vaccination campaign in those 283 counties. The mop-up operations have been important factors in alerting the various sectors of society, making them aware of the importance of immunization for the protection of their children. Some of the more important activities of Operation "Mop-Up" have generated additional resources at the local level, which were necessary to assure a successful operation. The preliminary data demonstrate that the cost of providing a dose of DPT house-to-house fluctuates between US\$0.06 and US\$3.00.

The Technical Advisory Group finds that "Operation Mop-Up" efforts, despite their rapid implementation, are very encouraging and urges the countries to continue striving in this effort. The countries which have carried out the operations and have held two house-to-house vaccination rounds, should closely monitor the occurrence of new cases of polio.

5.3 IMPORTATION OF POLIOVIRUS TO CANADA

In Canada, since 1975, 23 cases of polio have been documented, eight of which are vaccine-related. It is believed that one is due to an Endemic Wild Virus (in 1977), and the remaining 14 cases are the result of imported wild virus.

None of these imported cases were derived from transmission of poliomyelitis through primary contacts. Nevertheless, it appears that at least in the Canadian context (good public health and relatively high levels of sero-immunity), that the importation of the wild virus does not present a high risk of reintroduction of the endemic transmission of poliovirus.

5.4 REVIEW OF THE GLOBAL EPI PROGRAM

Global coverage with BCG, DPT3 and polio vaccine exceeds 60%. Coverage with measles vaccine is lower than this level. With these coverage levels, it is estimated that more than two million deaths from measles, neonatal tetanus and whooping cough, and some 250,000 cases of poliomyelitis can be prevented each year. The EPI should reach coverage levels of at least 80% with all the antigens by the year 1990. This would require breaking the "coverage barrier" which has been observed in many of the countries upon reaching coverage rates of 60 to 70%. These advances emphasize the quality of immunization services, assuring innocuity of the injections, the speed and courtesy of the service, the adaptation of the vaccine schedules, and the elimination of "false contraindications". In addition, the "missed opportunities" should be abolished to assure that all the contacts with health service be for immunization services.

5.5 DECLARATION MADE BY THE ANDEAN COUNTRIES IN CARTAGENA, COLOMBIA

Representatives of the Ministries of Health of the Andean Region and the international organizations (PAHO, UNICEF, and Rotary International) which participated in the Seventh Meeting of the TAG,

Considering,

1. That the date for reaching the goal of eradication of poliomyelitis in the Americas is impending, it is necessary to intensify activities and the application of adequate strategies in the Andean Region.
2. That the effort made by the countries has shown promising advances which foresees the feasibility of reaching the goal or eradication within the set timeframe.
3. That in the Andean Region there are common problems which could be solved more easily through joint actions among the member countries with technical and financial support of the international agencies.
4. That in the Americas, with the interchange of experiences and the planning of joint activities, the countries have been grouped by areas: Brazil, Mexico, Southern Cone, Central America, Andean Region, Latin Caribbean, and the English-speaking Caribbean.

Agree,

1. To conform, by means of this Declaration of Cartagena, the group of the Andean Region with the object of strengthening the Plan of Eradication of Poliomyelitis and the EPI, in order to define solutions to the problems common to the Region.
2. To request the recognition of the TAG and the international agencies the technical and financial support which would allow the objectives to be met.
3. To designate PAHO as secretary ex-officio of the group formed in this declaration.
4. To hold periodic meetings to evaluate the results and take corrective measures.
5. To obtain the political support in each country necessary for achieving the proposed objectives of this Declaration.
6. To set the next meeting in Ecuador in November of this year to determine the common short-term strategies.

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