EPI Newsletter

Expanded Program on Immunization in the Americas

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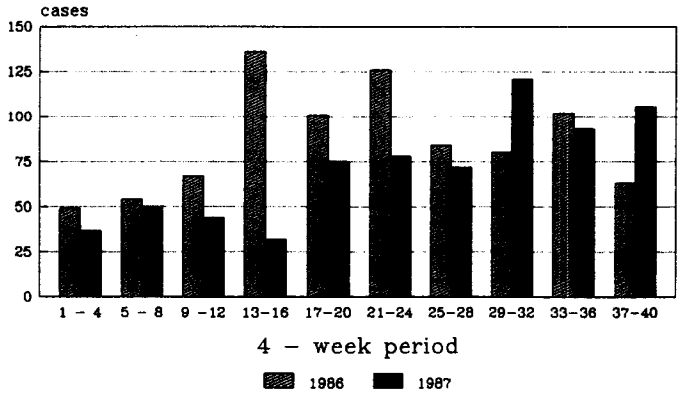
Polio Situation in the Americas: Weeks 1-40, 1987

For the first 40 weeks of 1987, 707 cases of poliomyelitis were reported to PAHO; for the same period in 1986, there were 821 cases. A comparison of cases per 4-week period (to week 40) in 1986 and 1987 is presented in Figure 1.

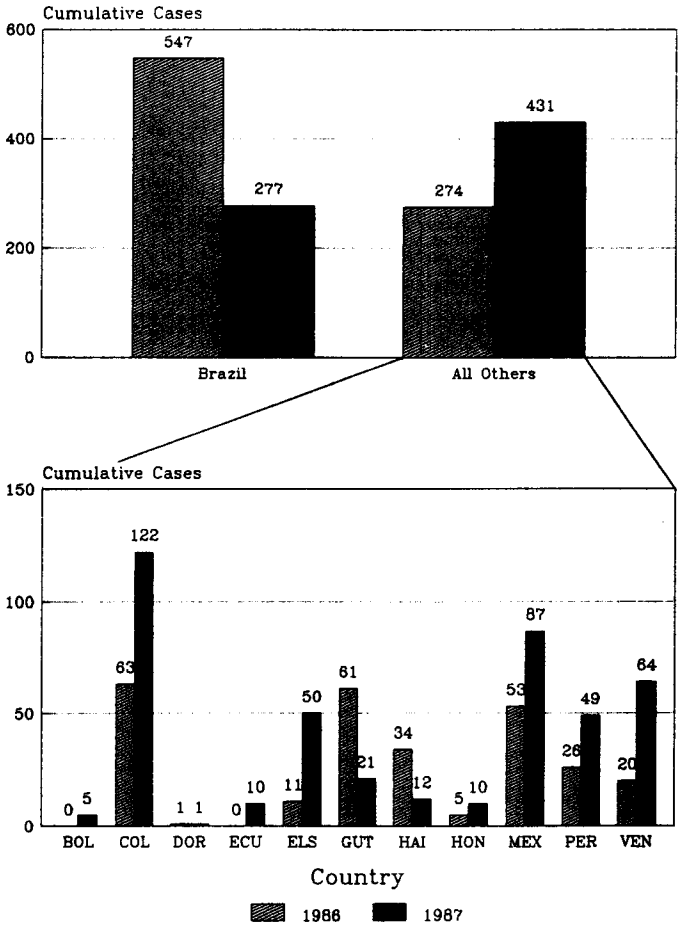
As shown in Figure 2, except for Guatemala, Brazil and Haiti, all countries are reporting more cases in 1987 than they did in 1986. The overall increase in number of cases reported by the countries does not necessarily represent an increase in poliovirus activity, but is rather the effect of the active surveillance efforts undertaken.

FIGURE 1. **Region of the Americas Polio Cases reported by 4-week period* Weeks 1-40, 1986 and 1987**



Source: Weekly telexes to PAHO
* Provisional data

FIGURE 2. **Region of the Americas Polio Cases Reported by Country* Weeks 1-40, 1986 and 1987**



Source: Weekly telexes to PAHO
* Provisional Data

In this issue:

Active Search for Polio Cases in Mexico

The first intensive search for cases of paralytic poliomyelitis, was undertaken in three districts (including the Federal District), for a period of three weeks starting April 27 and ending May 15, 1987. After reviewing hospital records, at least 59 cases were found that should have been studied and reported as probable, of which 31 should have been classified as confirmed.

Given the special circumstances of this inquest, including the amount of time devoted to it, some cases would have probably been discarded after a more careful analysis. Nevertheless, the outstanding feature of this study was the unequivocal demonstration that epidemiological surveillance of polio was still being conducted passively, subject to the reporting of cases in which a polio diagnosis was suspected and that hospitals were not even reporting.

As a consequence, the National Directorate of Epidemiology was motivated to accelerate a pending project that entailed visiting all of the Mexican states and working with the epidemiologists responsible for polio surveillance in the hospitals as well as the states. The objective was establishing active polio surveillance in 1987. During this process, case records were carefully reviewed for all cases that should have been reported as probable upon admission. Some of the most important second and third level health units in each district were visited, as were other potential sources of information, such as the vital statistics and rehabilitation units. The bases for the permanent organization and operation of a surveillance system with active search for cases were established in every district visited.

The visits to second and third level hospitals have proven to be an important factor in the finding of cases that should have been investigated and reported on time. This fact was made sufficiently clear with the participation of the National Pediatric Institute and the Children's Hospital of Mexico City, where all records were reviewed. Thus, health personnel at managerial levels should interest this type of institution in polio surveillance, in much the same manner as the interest of institutions and the population in general has been heightened and directed towards immunization activities during the National Vaccination Campaigns.

The surveillance system as such is quite simple and does not constitute an excessive workload for the health units, and for this reason, the existence and persistence of limitations cannot be excused, especially in a priority program aimed at the regional eradication of a disease.

The sources of information were selected on the basis of several suppositions regarding the behavior of cases within a community. These are: when a case of paralysis occurs in someone under 15 years of age (suspected case), a doctor will probably be sought for overall case management; when the doctor encounters a case of acute flaccid paralysis (probable case), regardless of diagnosis, the patient will be channeled to a second or third level care unit. On the other hand, if the child dies during the acute phase of illness, independent of diagnosis, or if immediate medical care was not sought, the case could have been detected either through the death certificate or in some rehabilitation center. These assumptions are not entirely valid because studies conducted in Mexico have shown that this is not necessarily the course of action followed when a case is detected.

Even though only a few of the units of each institution in each state have been visited, experience has shown that these have variable numbers of probable cases that were not reported on time. In addition, knowledge of these cases hinges on careful analysis of the information systems of each unit, institution, service, etc. Some of the examples are interesting; the rehabilitation unit of the University Hospital of Aguascalientes handles an important number of patients that are not admitted to the hospital; they therefore have no clinical files and are consequently not found by searching hospital records. In Aguascalientes and Chiapas, private practitioners, especially physical therapists and physicians specializing in rehabilitation, were an important source of probable cases. Unfortunately, it was not possible to obtain information on these patients or those of clinics and private hospitals, because they do not keep individual patient records. In some institutions, it is not infrequent that records are not kept in the same unit as the patient is, especially when the patient has been referred from another hospital. Rehabilitation units receive considerable numbers of probable cases, old and recent. Lastly, facial paralyses in children appear to be more common than previously expected and may be caused by poliovirus.

Case-finding and related activities undertaken in the strengthening of the polio surveillance system since May have already yielded objective results. Several cases that should have been classified as probable, according to the criteria established by PAHO, with onset in 1986 and 1987, have been detected. Only one third of all cases reported in the first 38 weeks of 1987, were found through the routine information sources (Table 1). The rest were found

TABLE 1. **Probable Polio Cases Reported, by Source of Report Weeks 1 - 38, 1987, Mexico**

Source	Number	%
Routine	46	34
Active case search	34	25
Virology Laboratory, ISET	33	24
Institutions that did not report*	24	17
TOTAL	137	100

*Refers to those institutions that did not report until the onset of strengthened surveillance efforts, in May, 1987.

through active search, in institutions that were not reporting cases before May, 1987 and through the virology laboratory of the Institute of Health and Tropical Diseases (ISET).

Also, for 1987, several indicators of epidemiological surveillance of poliomyelitis have been studied, such as the average intervals between:

a) the onset of paralysis and and the date the case was reported to the state health services (20 days);

b) the onset of paralysis and the date the first blood sample was taken (21 days);

c) the first and second blood samples (32 days);

d) the date of reporting to the state health services and to the General Directorate of Epidemiology (5 days).

The increase in registered cases does not necessarily reflect an increase in disease incidence, and some considerations should be made in this respect:

a) Some of the cases detected through active surveillance are not polio and should therefore be discarded when confirmation criteria are not met, just as with those found through the regular reporting system.

b) The case definitions handled through the surveillance system have high sensitivity but limited specificity, especially for the retrospective studies being conducted in the country.

c) In spite of being one of the most effective systems, polio surveillance was not detecting all probable cases, as demonstrated by the high numbers of probable cases found in the 1986 retrospective evaluation conducted in some units.

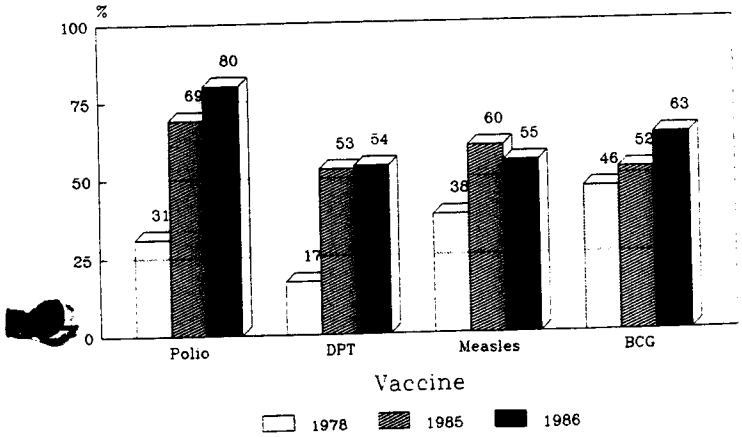
Editorial comment: Several countries in the Region are making efforts towards implementing active case-finding; this is one of the most important activities in the strengthening of epidemiological surveillance. The next step in this process is the achievement of timely reporting of suspected cases of polio, in order that appropriate control measures may be taken, as indicated in the Polio Eradication Field Guide (Technical Paper No. 6, 1987).

Taken from: "Boletín Quincenal de Poliomielitis," Sector Salud, Dirección General de Epidemiología, S.S.A., México, Nos. 20-24, Año I, and 1-5, Año II, 1987.

Vaccination Coverage Rates for 1986

In the Region of the Americas vaccine coverage rates for polio, DPT and BCG vaccines in children less than one year of age increased between 1985 and 1986 (Figure 1). Coverage with oral poliovaccine (OPV), reached 80 percent for the first time in 1986.

FIGURE 1. **Vaccination Coverage Rates for 1978, 1985 and 1986* Children Under One Year of Age Region of the Americas**



Source: PAHO
*Provisional data

The only exception is coverage with measles vaccine which showed a five percent decrease. This decrease reflects the lower coverage attained in the two most populated countries of the Region, Brazil and Mexico, as well as in the Andean sub-region (see Table 1).

In the Caribbean sub-region the majority of the country coverage rates for DPT and OPV are equal to or above 80 percent (Figure 2). For measles vaccine, Jamaica, Guyana, Trinidad and Tobago, and Turks and Caicos reported rates lower than 50 percent.

In Central America, vaccine coverage rates with all the EPI antigens, with the exception of BCG, showed improvement between 1985 and 1986.

In Central America, vaccination coverage varies from above 80 percent for DPT and OPV, in Belize, Costa Rica and Nicaragua, to below 40 percent in Guatemala. However, in the Andean sub-region OPV and DPT coverage figures have remained the same and range from below 40 percent for Bolivia to approximately 60 percent for Colombia and Venezuela. Overall BCG vaccination coverage figures have increased and measles vaccine coverage has decreased.

In Brazil and Mexico, OPV coverage rates have improved considerably in 1986, in comparison with 1985. The countries of the Southern Cone (Argentina, Chile, Paraguay and Uruguay) show continued improvement in coverage with measles, DPT and OPV vaccines.

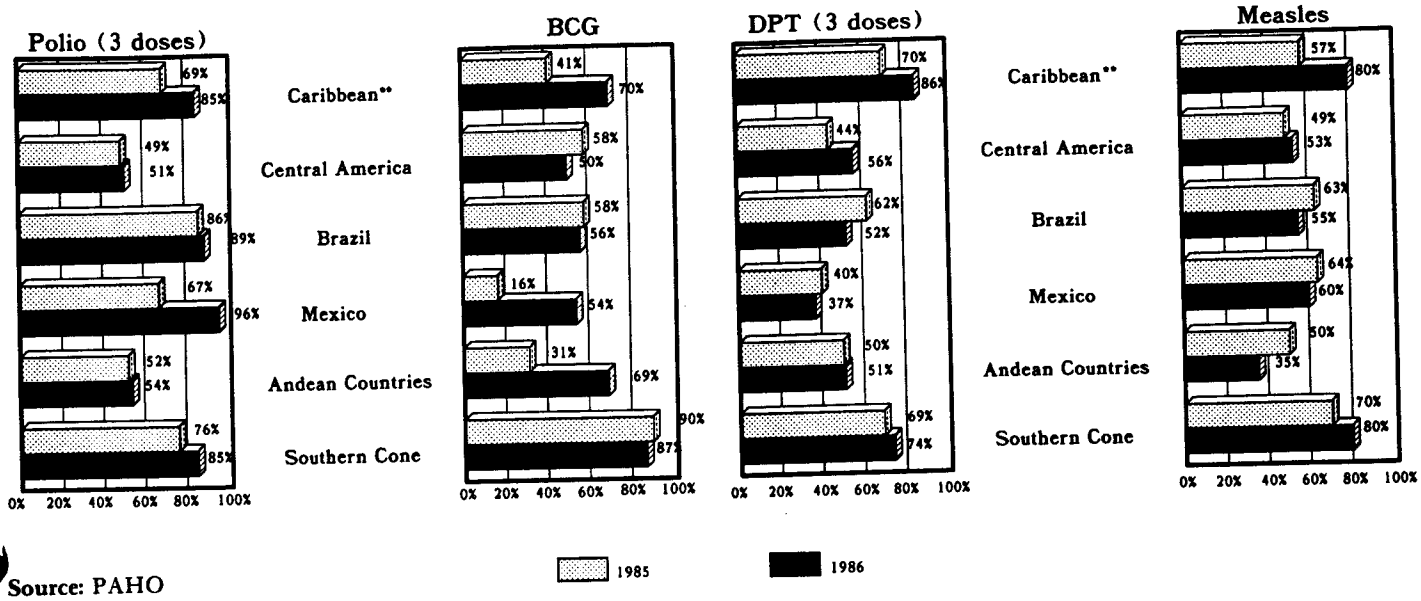
Table 1. **Vaccination Coverage in Children Under One Year of Age**
Region of the Americas, 1986
(Preliminary Data)

COUNTRY	DPT 3rd dose %	POLIO 3rd dose %	BCG %	Measles %
LATIN AMERICA				
Argentina	67	79	89	87
Bolivia	29	31	15	17
Brazil	52	89[1]	56	55
Chile	92	86	99	91
Colombia	57	65	69	56
Costa Rica	94	94	61	55
Cuba	99	99[1]	99	86
Dominican Republic	...	...	...	...
Ecuador	43	43	93	49
El Salvador	66	70	51	51
Guatemala	33	36	7	47
Haiti	...	...	...	...
Honduras	63	63	72	60
Mexico	34	96[1]	54	60
Nicaragua	55	89	99	61
Panama	70	71	91	73
Paraguay	52	99[1]	51	46
Peru	50	50	54	41
Uruguay	70	83	92	82[2]
Venezuela	58	67	86	48
CARIBBEAN				
Anguilla	88	85	99	65
Antigua & Barbuda	96	96	—	80[2]
Bahamas	85	81	—	83[2]
Barbados	79	80	—[3]	84[2]
Belize	95	81	80	81
Bermuda	72	86	—	77[2]
British Virgin Islands	99	99	—	82[2]
Cayman Islands	95	95	73	67[2]
Dominica	93	92	87	97
Grenada	98	92	—	62
Guyana	64	67	76	42
Jamaica	74	74	73	36
Montserrat	99	99	99	55[2]
St. Christopher/Nevis	99	99	—[3]	96
St. Lucia	78	88	73	91[2]
St. Vincent/Grenadines	95	95	76	88
Suriname	80	80	—	78
Trinidad and Tobago	70	71	—	42[4]
Turks and Caicos Islands	72	72	96	49[2]

Source: PAHO
... Data not available
— Vaccine not given in the National Program
[1] Coverage based on two doses of OPV
[2] MMR vaccine is used
[3] Only children five years or older are immunized
[4] MR vaccine is used

In general, the countries of the Region are improving vaccination coverage as a result of EPI acceleration and the establishment of Vaccination Days or Campaigns. Yet much remains to be done if national immunization programs are to reach the EPI goal of the provision of immunization services to 100 percent of children and women of childbearing age by 1990. Every health worker should make all possible efforts to educate parents on the benefits of immunization and to take every opportunity to vaccinate susceptible children before they reach one year of age.

FIGURE 2. **Vaccination Coverage 1985 and 1986***
Region of the Americas, by Subregion
Children Under One Year of Age



Source: PAHO
*Provisional data
**Does not include Haiti and the Dominican Republic

Prospects for New Pertussis Vaccine Encouraging

Pertussis (whooping cough) is a significant problem, particularly in the developing world. It is estimated that approximately 1.5 percent of children in developing countries who acquire the disease will die from it or its complications. Over 700,000 children are believed to have died from pertussis in 1983 alone.

Whole-cell pertussis vaccines, initially developed in the 1930s, are highly effective in preventing pertussis. Approximately 70-90 percent of infants who receive a primary series of at least three doses are protected.

However, whole-cell vaccines, while generally safe, have been associated on rare occasions with serious neurologic disorders. In fact, controversy surrounding the safety of whole-cell pertussis vaccine has led to suspension of routine vaccination (Sweden), to decreases in vaccine acceptance rates (United Kingdom), or to increases in liability suits and subsequent significant increases in vaccine prices (United States).

The development of an improved pertussis vaccine associated with fewer side effects is currently a high priority in many countries. The major goal is to produce vaccines that are at least as effective as current vaccines without the rare but serious side effects.

Japanese Vaccines

Improved acellular pertussis vaccines have been developed in Japan. Licensed in 1981, these vaccines mainly contain fimbrial hemagglutinin (FHA) and lymphocytosis-promoting factor (LPF), two antigens considered important in conferring protection against pertussis. The vaccines have been used primarily in children 2 years of age and older. Results to date suggest that common local reactions are less frequent, and that the protection conferred by these vaccines in children age 2 years and older is as great or greater than that following the use of whole-cell vaccines.

Based on these encouraging results, efforts to develop similar or related vaccines or to further evaluate the Japanese products are under way in several countries.

Evaluation of Japanese Vaccines

Swedish scientists have been evaluating two Japanese vaccines in young infants since 1984. The results from these preliminary studies have been consistent with Japanese data on the safety and immunogenicity of these vaccines.

A full-scale field efficacy trial was started in February 1986. This trial will enroll approximately 4,000 6-month-old children who will be randomly assigned into one of two vaccine groups or into a placebo group. The vaccines being tested include a product containing principally LPF and FHA and another containing principally LPF. The trial was expected to run through mid-1987.

If successful, one of these vaccines will be introduced for routine use in Sweden. The information obtained is also expected to assist researchers in other countries seeking to formulate a safer vaccine that contains only the key antigens required for protection against pertussis.

Europe and North America

In addition to evaluating existing Japanese vaccines, scientists in several laboratories in Europe and North America are in various stages of developing other acellular pertussis vaccines, some of which are similar in composition to Japanese products and some of which contain more or fewer antigens.

Thus, British scientists are currently developing a vaccine containing more antigens (LPF, FHA, and agglutinogens) and are expected to begin preliminary testing in humans this year. If results are satisfactory, a full-scale efficacy trial comparing acellular and whole-cell vaccines is expected to be launched in early 1987. American government sicentists at the National Institutes of Health are developing an acellular vaccine containing only LPF antigen; they are also planning initial studies in humans in the near future.

Several vaccine manufacturers in North America and Europe are also developing their own vaccines, most of which now seem far enough along to plan for preliminary studies in humans this year. The composition of these vaccines is reported to be similar to the types already described.

Conclusion

Because of the promising results obtained to date with acellular pertussis vaccines in Japan, and because of the current intensive level of effort in several government and private laboratories, it seems reasonable to predict that improved pertussis vaccines will be licensed and available for more wide-spread marketing within the next few years.

Source: *World Immunization News*, Vol. 2, No. 2,
The Task Force for Child Survival, Decatur, Georgia, 1986

Expanded Program on Immunization and Nutrition. Joint WHO/UNICEF Statement on Vitamin A for Measles

Evidence mounts that measles is an important risk factor for the development of severe vitamin A deficiency and blindness in Africa as well as in some of the most densely populated countries of Asia. Vitamin A status at the time of measles infection also seems to be critical to outcome.

Measles kills two million children each year, accounting for more than half of deaths attributable to the six EPI target diseases. In regions where the disease is most severe, community studies consistently have shown case fatality rates of over one percent. Death is associated with serious secondary complications such as diarrhea, pneumonia, protein-energy malnutrition and blindness.

Impact of measles on vitamin A status

Measles depletes vitamin A reserves by markedly increasing utilization at the same time as dietary intake and absorption are reduced. Previously marginal vitamin A stores in the liver of malnourished children are rapidly exhausted. In Thailand, a third of children with measles had serum vitamin A concentrations below 0.35 umol/l (10 ug/dl), a level at which there is very high risk of developing corneal ulcers. In Indonesia, children who had measles during the preceding four weeks were 11 times more likely to develop corneal xerophtalmia than children who had not had measles.

By depleting vitamin A, measles can precipitate rapid deterioration of the cornea and blindness. The mechanism differs from the direct invasion of the cornea by either measles or herpes simplex viruses, which also cause blindness in some malnourished children.

The dimensions of the post-measles blindness problem in Africa alone are considerable. Thus half the number of children in schools for the blind in Tanzania and Malawi give a history of measles immediately preceding the blinding episode. In Africa as a whole, where the attack rate for corneal damage following measles can reach four percent, corneal scarring accounts for the majority of childhood blindness.

Vitamin A status and survival in childhood

To what extent does vitamin A deficiency increase morbidity and mortality?

First, 50 to 80 percent of children with blindness asso-

Reported Cases of EPI Diseases

Number of reported cases of measles, poliomyelitis, tetanus, diphtheria and whooping cough, from 1 January 1987 to date of last report, and for same epidemiological period in 1986, by country

Subregion and Country	Date of last report	Measles		Polio-myelitis§		Tetanus				Diphtheria		Whooping Cough	
						Non-neonatal		Neonatal					
		1987	1986	1987	1986	1987	1986	1987	1986	1987	1986	1987	1986
NORTHERN AMERICA													
Canada	01 Aug.	1 847	13 953	—	—	2**	3**	...	...	1	2	594	1 162
United States	10 Oct.	3 372	5 563	—	—	33**	20**	...	...	3	—	1 903	2 638
CARIBBEAN													
Antigua & Barbuda	28 Mar.	—	—	—	—	**	—	—	—	—	—	—	—
Bahamas	15 Aug.	29	30	—	—	**	—	—	—	—	—	—	—
Barbados	15 Aug.	2	1	—	—	—	—	2	—	—	—	—	1
Cuba	20 Jun.	629	2 213	—	—	3	10**	—	...	—	...	62	204
Dominica	15 Aug.	76	30	—	—	—	—	—	—	—	—	—	—
Dominican Republic	23 May.	99	241	—	1	13	18	3	5	23	20	22	74
Grenada	12 Sept.	6	3	—	—	—	—	—	—	—	—	1	7
Haiti	*	...	...	12	34	...	...	...	...	...	...	...	...
Jamaica	*	...	...	—	—	...	...	...	...	...	...	...	...
St. Christopher/Nevis	*	...	...	—	—	...	...	...	...	...	...	...	...
Saint Lucia	25 Apr.	3	2	—	—	—	—	—	—	—	—	—	—
St. Vincent and the Grenadines	*	...	...	—	—	...	...	...	...	...	...	...	...
Trinidad & Tobago	15 Aug.	306	1 497	—	—	3	1	—	—	—	—	7	4
CONTINENTAL MID AMERICA													
Belize	12 Sept.	216	48	—	—	—	...	—	...	1	...	—	7
Costa Rica	15 Aug.	3 426	1 263	—	—	1**	1**	...	...	...	—	100	75
El Salvador	15 Aug.	231	167	50	11	31	25	11	25	2	—	111	287
Guatemala	28 Feb.	33	...	21	61	...	...	...	...	...	...	23	...
Honduras	15 Aug.	515	383	10	5	12	6	4	4	—	—	226	96
Mexico	18 Jul.	2 076	7 161	87	53	169	166	...	...	1	—	494	655
Nicaragua	28 Feb.	163	425	—	—	...	...	1	5	—	—	19	84
Panama	28 Mar.	1 037	1 509	—	—	1	2	1	—	—	—	4	14
TROPICAL SOUTH AMERICA													
Bolivia	*	...	...	5	0	...	...	...	...	...	...	...	...
Brazil	15 Aug.	42 297	47 117	277	547	949	1 259	256	349	924	1 119	11 077	15 911
Colombia	*	...	...	122	63	...	...	...	...	...	...	...	...
Ecuador	*	...	...	10	0	...	...	...	...	...	...	...	...
Guyana	*	...	...	—	—	...	...	...	...	...	...	...	...
Paraguay	20 Jun.	152	161	—	—	25	19	18	20	10	11	65	75
Peru	25 Apr.	375	...	49	26	8	...	12	...	1	...	314	...
Suriname	20 Jun.	3	20	—	—	1	—	—	...	—	—	—	—
Venezuela	20 Jun.	11 274	6 368	64	20	1	38	8	6	1	1	454	1 496
TEMPERATE SOUTH AMERICA													
Argentina	25 Apr.	852	1 149	—	—	32**	26**	...	...	1	7	479	655
Chile	15 Aug.	1 184	6 308	—	—	8	14	2	—	113	150	16	24
Uruguay	20 Jun.	177	19	—	—	1	1	—	—	—	—	291	472

* No 1987 reports received.

** Tetanus data not reported separately for neonatal and non-neonatal cases. Total tetanus data is reported in non-neonatal column.

§ Data for polio is through week 40 (ending 10 October 1987).

— No cases

... Data not available

ciated with vitamin A deficiency are dead within a few months of the blinding episode.

Second, in a recent Indonesian report even mild signs of vitamin A deficiency in pre-school age children were associated with a fourfold increase in mortality; incidence of diarrhea and respiratory disease was increased two to threefold.

Third, in a randomized controlled community trial in Indonesia, childhood mortality was approximately 30 percent lower in pre-school children supplemented with large, oral doses of vitamin A.

The Advisory Group on Nutrition to the Sub-Committee on Nutrition (SCN) of the UN Admininistrative Committee on Coordination concluded that "there is justification to expect that effects of this magnitude would be seen in other settings with similar conditions, including at least similar severity of vitamin A deficiency with associated xerophthalmia, similar high prevalences of childhood morbidity and mortality and similar effectiveness of the xerophthalmia control program." Furthermore, the SCN decided that a beneficial effect on child mortality was a likely additional expectation from vitamin A supplementation programs mounted for the control of xerophthalmia.

Mortality associated specifically with measles may also be greatly reduced by supplying adequate vitamin A. A clinical trial in Tanzania of children admitted to the hospital with measles has looked at the effects of large, oral dose supplements of vitamin A on mortality. Children given 200,000 international units (IU) of vitamin A on two successive days were less likely to die than children given routine treatment. Mortality was twice as high in the control group (13 percent) as the supplemented group (seven percent), the greatest difference being in children under the age of two years.

Action Recommended

Present evidence suggests that improvement of vitamin A status may reduce morbidity and mortality rates among children of pre-school age in all communities where vitamin A deficiency exists. Further community assessments may be needed to determine the priority of introducing vitamin A intervention programs for all young children in such communities. One such intervention is routine high dose supplementation, the benefits of which appear to be substantial in children with marginal vitamin A stores.

High dose vitamin A supplementation should be provided to all children diagnosed with measles in communities in which vitamin A deficiency is a recognized problem. In countries where the fatality rate of measles is one percent or higher it is sensible on the basis of current evidence to provide vitamin A supplements to all children diagnosed with measles.

The dose of vitamin A should be 100,000 IU, by mouth, in children below 12 months of age, and 200,000 IU in children above the age of one year. The dose should be administered immediately on the diagnosis of measles. If any of the eye signs of vitamin A deficiency are present, the initial dose should be repeated the next day and again one to four weeks later.

The *EPI Newsletter* is published every two months, in English and Spanish, by the Expanded Program on Immunization (EPI) of the Pan American Health Organization (PAHO), Regional Office for the Americas of the World Health Organization (WHO). Its purpose is to facilitate the exchange of ideas and information concerning immunization programs in the Region in order to promote greater knowledge of the problems faced and their possible solutions.

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