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Expanded Program on Immunization in the Americas

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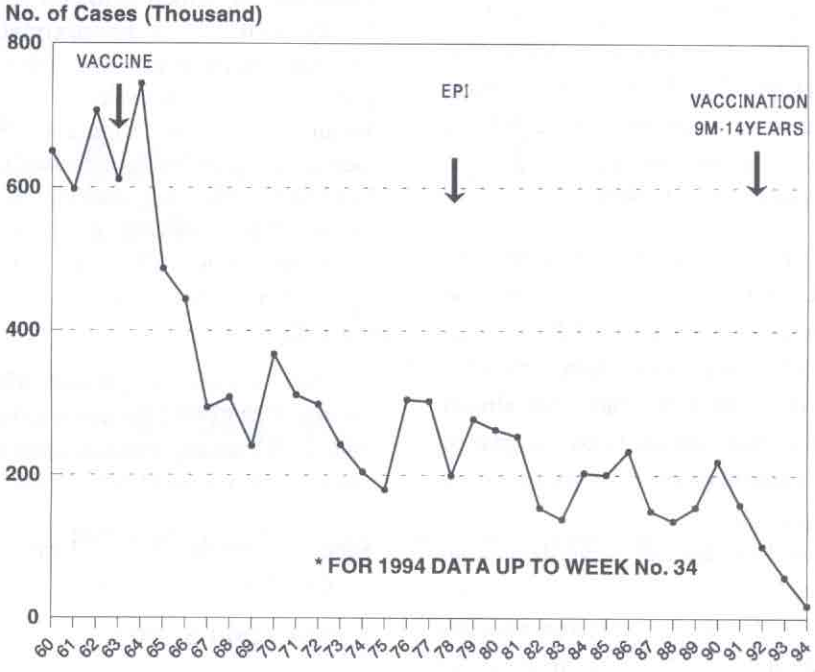
Measles Elimination by the year 2000 !

Following the successful effort to eradicate the wild polio virus from the Americas (See EPI Newsletter, Volume XVI Number 4, 1994) the 24th Pan American Sanitary Conference (PASC) resolved to set the target to eliminate measles from the Americas by the year 2000.

Efforts to control measles began as soon as the vaccine was licensed in 1963. As the vaccine became more widely available and the governments in the Region began to include the vaccine in their immunization programs the reported number of cases began to decrease dramatically between 1964 and 1969. See Figure 1.

FIGURE 1. NUMBER OF MEASLES CASES NOTIFIED REGION OF THE AMERICAS, 1960 - 1994*



***SOURCE*: PAHO**

In 1970 the Ministers of Health developed a Ten-Year Health Plan and set the goal of reducing measles mortality to level of 1.0 cases per 100,000 case by 1980. However, no sound control strategies were implemented and this goal was not attained. Only Bahamas, Barbados, Canada, Cuba and the United States were able to reach this goal. In 1977, the EPI was established in the Americas and the coverage with measles began to improve. At the end of decade of the 1970's coverage data available indicate that the coverage with measles vaccine was not uniform throughout the Region nor within the country themselves. At the end of 1980 vaccine figures from the different countries showed vaccination coverage for children 12 - 23 months ranged from a high of 67% for two regions in Costa Rica to 31% for children in Santo Domingo in the Dominican Republic. As the use of measles vaccine in national immunization programs began to improve during the decade of the 1980's, measles vaccination in children under 12 months of age increased to 53 % by 1984. By 1990 measles vaccine was being administered to 76% of children under 12 months of age.

In this issue:

However, by 1984 it was evident that the Region began experiencing cyclical epidemics of measles outbreaks every 3-4 years despite the increase in coverage. See Figure 1. In fact, measles epidemics appeared in countries like the U.S. with measles coverage rates superior to 95%. These epidemics were caused by the accumulation of large pools of susceptibles over a period of time due to unimmunized individuals. Also the age of disease incidence was being modified. Measles outbreaks and sporadic cases began to be seen in older age groups.

In 1986, Cuba decided to eliminate measles, and with technical support from PAHO launched a strategy where all children between the ages of 9 months and 14 years of age were vaccinated with measles vaccine independent of their previous vaccination status or disease history. The strategy was aimed at eliminating the pockets of susceptibles that potentially formed chains of disease transmission. Thereafter, each new cohort of new borns would have to be successfully vaccinated in order to prevent a build up of susceptibles.

In 1988, the Ministers of Health of the English Speaking Caribbean followed suit and launched a measles elimination effort using the same strategy. The Caribbean initiative, besides securing the technical cooperation from PAHO was financially supported by Rotary International and the Canadian Public Health Association (CPHA).

This strategy proved to be effective and soon thereafter, not only did Chile, Brazil, Mexico, and Argentina but also the Central American Ministers of Health and the Andean Andean Ministers of Health, voted to eliminate measles from their sub-regions. Between 1992 and 1994 almost every country in the Region that had declared the goal of measles elimination had undertaken the strategy proposed by PAHO of a one time vaccination of children nine months to 14 years of age followed by disease surveillance and routine vaccination of each new cohorts of new borns. Both Canada and the USA have also declared measles elimination goals. The almost simultaneous undertaking by the governments of the Region in implementing the one time measles campaign within a two year period resulted in the dramatic reduction of reported measles cases in the Region as shown in Figure 1.

With the remarkable success being made against measles, the Pan American Sanitary Conference, in their meeting held in Washington D.C. in September, 1994, set the target of measles elimination for the Western Hemisphere by the Year 2000.

Measles Update - United States, First 26 weeks, 1994.

As of July 2, 1994 (week 26), local and state health departments in 31 states had reported a provisional total of 730 measles cases[1] to CDC for 1994 (Figure 1). This represents a greater than fourfold increase over the historic low of 167 cases reported by 18 states during the same period in 1993. In addition, 250 cases were reported in 1994 for the U.S. territories of Guam (211) and the commonwealths of the Northern Mariana Islands (26) and Puerto Rico (13). This report summarizes the epidemiologic characteristics of measles cases reported in the United States for the first 26 weeks of 1994.

Characteristics

Case Classification. Of the 730 reported cases, most (696[95%]) were indigenous to the United States, including 588 (80%) acquired in the state reporting the case and 108 (15%) that resulted from spread from another state[2]. Fifteen states reported a total of 30 (4%) internationally acquired cases-one of which initiated a college outbreak in New Jersey resulting in approximately 100 cases. The 30 international importations originated from or occurred among persons who had traveled in Asia (Hong Kong, Indonesia, Japan, Korea, and Vietnam), Europe (England, France, Germany, Spain, and Switzerland), Latin America (Dominican Republican, Ecuador, and Mexico), Canada, Iran, and Israel. Of the 30 persons with internationally acquired measles, 11 were aged <5 years; 10, aged 5-19 years; and nine, aged ≥ 20 years. Six of the 20 persons for whom data were available were U.S. citizens.

Age. Of the 725 persons with cases for whom age was known, 172 (24%) occurred among persons aged <5 years, 368 (51%) among persons aged 5-19 years, and 185 (26%) among persons aged ≥20 years. Of the 172 cases among persons aged <5 years, 49 (28%) occurred among persons aged <12 months. Of the 71 cases for whom serologic testing for measles was reported, 70 were serologically confirmed.

Vaccination Status.

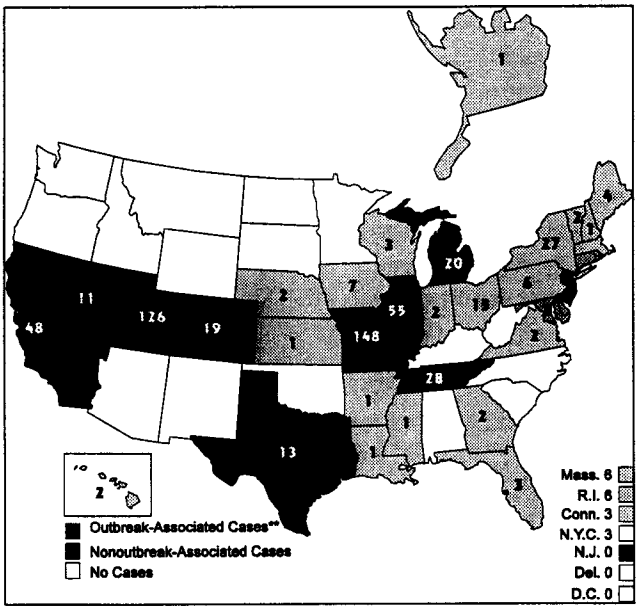
Of 274 reported patients for whom vaccination data were available, 44 (16%) had received at least one dose of measles-containing vaccine (MCV) on or after their first birthday and >14 days before the onset of symptoms. A total of 81 (30%) patients considered to be unvaccinated received a first dose of MCV ≤14 days before the onset of symptoms; most vaccinations were administered during an outbreak involving previously unvaccinated persons. Five cases were reported among persons who had received two doses of MCV; for two of these five persons, the second dose was administered ≤ 14 days before symptom onset.

Of the 230 patients who were either unvaccinated or vaccinated ≤ 14 days before illness onset, 166 (72%) had a religious or philosophic exemption to vaccination. Forty-three (19%) patients were unvaccinated but vaccine-eligible (i.e., U.S. citizen aged≥16 months with no medical, religious, or philosophic exemption to vaccination), and 21 (9%) were younger than the recommended age for vaccination. Vaccination status varied by age group. Of measles patients aged 5-19 years, 14% had received at least one dose of MCV at an appropriate age, compared with 23% of patients aged 1-4 years.

Outbreaks

Fifteen measles outbreaks (clusters of five or more epidemiologically linked cases) were reported by 10 states during the first 26 weeks of 1994 and accounted for 82% of all cases reported for this period. Six outbreaks (range: 25-148 cases) occurred in high schools or colleges, five (range: 5-32 cases) among preschool-aged children, and four (range:5-126 cases) in other settings. All high school and college outbreaks occurred in institutions with no vaccination requirements (two institutions) or a requirement for only one dose of MCV (four institutions). Three of the largest outbreaks occurredamong persons who do not routinely accept vaccination in St. Louis County, Missouri (148 cases, high school); Jersey County, Illinois (52 cases, college); and Salt Lake County, Utah (126 cases, community). In addition to these outbreaks, a large outbreak (approximately 200 cases) occurred predominantly among preschool-aged children in Guam.

Figure 1. Reported Cases* of Measles, by State United States, First 26 Weeks, 1994



*n=730
**State reporting more than five epidemiologically linked cases.

CDC performed genomic sequencing of measles viruses isolated from seven outbreaks in the continental United States during 1993-1994. Preliminary analysis indicates that all of the viruses from these recent outbreaks (most from 1994) are genotypically different from viruses isolated during the 1989-1991 measles resurgence. All viruses obtained during 1989-1991 were closely related by sequence analysis, even though they were obtained from cases in different geographic regions. In contrast, isolates from recent U.S. outbreaks were genotypically similar to viruses from European or Japanese sources.

Reported by: State and local health depts. L Espadon, MD, Guam Dept of Public Health and Social Svcs. BJ Francis, MD, State Epidemiologist, Illinois Dept of Public Health. HD Donnell, Jr, MD, State Epidemiologist, Missouri Dept of Health. CR Nichols, MPA, State Epidemiologist, Utah Dept of Health. National Immunization Program; Measles Virus Section, Respiratory and Enteric Viruses Br, Div of Viral and Rickettsial Diseases, National Center for Infectious Diseases, CDC.

Editorial Note: Although measles incidence has increased since the historic low reported in 1993, measles incidence during the first 26 weeks of 1994 remains substantially lower than in previous years. In addition, epidemiologic characteristics of cases reported in 1994 are consistent with patterns observed since the end of the measles resurgence during 1989-1991. These patterns include 1) a shift in age incidence from preschool-aged children to older age groups, 2) the importance of international importations in the spread of measles, and 3) the spread in groups whose members do not routinely accept vaccination-in particular, cases among groups with religious or philosophic exemption to vaccination accounted for 45% of all cases reported during the first 26 weeks of 1994. Maintaining communication with these groups permits rapid detection of cases and prompt implementation of outbreak-control measures when cases occur and may encourage some members to accept vaccination.

During 1994, measles cases have occurred predominantly among high school-and college-aged persons, many of whom previously had received one dose of measles vaccine. In contrast, during the 1989-1991 measles resurgence, cases occurred predominantly among preschool-age children. Since 1991, the proportion of cases among persons aged <5 years has decreased substantially-from 49%-50% during 1991-1992 to 24% during the first 26 weeks of 1994. This decline may have resulted from systematic efforts to increase measles vaccination coverage (approximately 85% in 1993) among preschool-aged children at 24 months of age.

The outbreaks among previously vaccinated high school-and college-aged persons emphasize the importance of implementing and enforcing vaccination with a second dose of MCV among persons in these age groups. Findings of a

recent assessment indicated that the risk of measles outbreaks is lower among colleges that enforce prematriculation requirements for measles vaccination when compared with those that do not have or do not enforce such policies.

The laboratory findings during 1994 are consistent with other epidemiologic data suggesting that measles transmission may have been interrupted in the United States in late 1993 and indicate that international importations account for a substantial proportion of disease attributable to measles in 1994. Although only one large outbreak has been epidemiologically linked to a known importation, genomic sequencing of measles viruses suggests that cases in 1994 resulted from reintroduction of measles by international importations.

Although indigenous measles transmission in the United States may have been transiently interrupted, the continued occurrence of measles among U.S. residents demonstrates that additional efforts are required to attain the Childhood Immunization Initiative goal of sustained elimination of indigenous measles in the United States by 1996. These efforts should include 1) rapid detection of cases and implementation of appropriate outbreak-control measures, 2) achievement and maintenance of high levels of vaccination coverage among preschool-aged children in all geographic regions, and 3) greater implementation and enforcement of the two-dose recommendation among high school and college students. In addition, the source of measles infection should be established for all cases to define better the chains of disease transmission and to help develop more effective control measures.

State and local health departments are encouraged to investigate thoroughly all cases to identify the source of measles infection and to obtain specimens for virus isolation. Specimens should be obtained from all sporadic cases and from selected outbreak-associated cases. Specimens may be collected from nasal washings within 1-3 days of rash onset or from urine samples within 2 weeks of rash onset. Additional guidelines for specimen collection and handling can be obtained from CDC's Division of Viral and Rickettsial Diseases, National Center for Infectious Diseases, telephone (404) 639-3512, or from CDC's National Immunization Program, telephone (404) 639-8226.

Source: Morbidity and Mortality Weekkly Report, September 23, 1994/ Vol.43/No.37; Centers for Disease Control and Prevention, U.S. Department of Health and Human Services/ Public Health Services, Atlanta, Georgia

[1] Comprises cases reported to CDC's National Notifiable Diseases Surveillance System through July 2, 1994 (week 26), and cases reported subsenquently that occurred during this period.

[2] Acquired in another state or linked within two generations to an out-of-state importation.

Poliomyelitis Surveillance

While the International Commission for the Certification of Poliomyelitis Eradication (ICCPE) has declared that the transmission of the wild poliovirus has been interrupted , it also stipulated that "Ongoing targeted surveillance for cases of acute flaccid paralysis (AFP) and for the presence of wild poliovirus will be absolutely necessary to assure that the Region of the Americas remains polio-free" (See EPI Newsletter Vol. XVI. No.4, September 1994). The Ministers of Health of the Region of the Americas, meeting in their 24th Pan American Sanitary Conference, requested both the national commissions for the certification of poliomyelitis certification and PAHO to maintain the monitoring of polio surveillance indicators until the world is polio-free.

Indicators for Evaluating Poliomyelitis Surveillance in Latin America, 1994*

	1	2	3	4
Chile				
Colombia				
Cuba				
Ecuador				
El Salvador				
Honduras				
Mexico				
Nicaragua				
Peru				
Venezuela				
Bolivia				
Guatemala				
Paraguay				
Panama				
Argentina				
Brazil				
Costa Rica				
Dom. Rep.				
Uruguay				
Haiti				

Meet criteria

1. 80% Weekly Reporting Units
2. 80% Investigated within 48 hours
3. 80% of Cases with 2 adequate stool samples taken
4. AFP Rate

* Up to week 13 October

Source: **EPI/PAHO (PESS)**

Figure 2 presents the performance by country regarding each of the four critical surveillance indicators up to October 1994 that will be used to evaluate if the countries are maintaining the necessary surveillance that will permit both the national commissions and PAHO to judge if they are polio free. The four performance indicators are: 1) weekly negative notification from at least 80% of all weekly reporting units; 2) detection of a rate of least 1.0 cases of AFP per 100,000 children under the age of 15; 3) investigation, by a trained epidemiologist, of at least 80% of cases of AFP, within 48 hours of notification; and 4) collection of two stool specimens within two weeks of paralysis onset, from at least 80% of AFP cases. The Technical Advisory Group (TAG) recommended that stool samples from contact no longer need to be collected routinely, however, they should

be taken when the situation warrants, such as when adequate stool samples cannot be obtained from the case or if there is increased suspicion of wild polio infection.

The national commission in each country, in coordination with the Ministry of Health, must routinely monitor the performance of their country on each of the indicators. Failure to meet the criteria may indicate that there are problems with AFP surveillance, thereby increasing the risk, that should the wild polio virus be introduced, it may go undetected until an outbreak of paralytic polio occurs.

Diphtheria Epidemic in Ecuador

BACKGROUND

The incidence of diphtheria in the Western world has diminished considerably in recent years, primarily due to the high vaccination coverage attained with diphtheria toxoid and with DPT, especially in children. The World Health Organization reports major declines worldwide, albeit to a lesser extent, since the disease continued to be endemic in much of the Third World.

In addition to the decline in incidence, there has been a change in the epidemiological profile of diphtheria. In periods of high incidence and low coverage, the disease mainly affects children. At present it has become a disease of adults, as is shown in the recent epidemics in the countries of the former Soviet Union and other countries of Eastern Europe.

The increase in the percentage of cases in adults reflects the decline in immunity in the adult population as a result of less natural exposure to the disease and the failure due to false contraindications to immunize children with 3 doses of DPT vaccine before they reach one year of age.

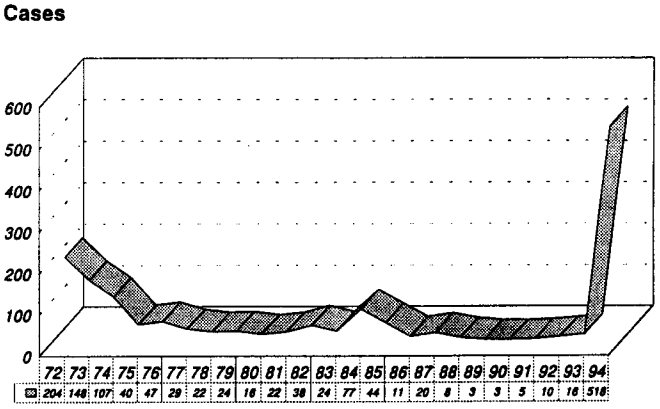
In the United States, serological studies reveal that 62% of adults ages 18 to 39 years, and 41% to 84% of persons over 64 years lack protective levels of antitoxin in the blood. In Denmark, 26% of the 30 to 70 years age group had less than the protective levels of diphtheria antitoxin. In the Russian Federation, based on the report of the last epidemic on record, changes were observed in the profile of immunity in the population beginning in late 1979, when the adults became more susceptible to diphtheria.

THE EPIDEMIC IN ECUADOR

From 1972 to 1991 diphtheria showed a marked downward trend in Ecuador, with only sporadic cases reported beginning in 1988. In 1984, there was an epidemic with 77 cases, 46 of which occurred in the province of Guayas; most of those cases were in children ages 5 to 14 years. The current epidemic began in Quito, province of Pichincha, in week 39 of 1993, with most cases in persons over 15 years of age (Graphs 1 and 3).

In week 29 of 1993, the first two cases from the periphery of Quito were reported, followed by an upward trend in incidence of the disease, especially from week 10 of 1994. Reports suggested that an epidemic had occurred in an area that had not reported any cases since 1989.

Graph 1. Reported Cases of Diphtheria Ecuador, 1972 - 1994*



*** Up to week 36**
***Source:* Ministry of Health**

From week 29 of 1993 to week 26 of 1994, 190 cases were reported (13 in 1993 and 177 in 1994) in the province of Pichincha. Of these, 184 were from Quito and six from other provinces (Graph 2).

In 1994, cases were first reported in the provinces of Guayas and El Oro in weeks 10 and 13, respectively. In Guayas, with 22 cases reported, the disease did not spread to the extent it had in Pichincha and El Oro. El Oro has the highest incidence in Ecuador, with an attack rate of 44 per 100,000 population. In some other provinces sporadic cases were reported as follows: Carchi (1), Azuay (2), Napo (1), and Pastaza (1). In total up to week 26 of 1994, there have been 411 cases.

In Ecuador the Expanded Program on Immunization follows the standard of three doses of DPT for children under 1 year, and a booster one year after the third dose. The school health program for children ages 6 to 12 years provides for two doses of DT vaccine (for children) for primary schoolchildren (from first to sixth grade). There is no specific policy on diphtheria vaccination for the adult population.

accination coverage with DPT in children under 1 year has risen steadily in recent years, reaching its highest level in 1992 (86.9%). In 1993 coverage was 79.1%.

In view of the scale of the epidemic in Pichincha (especially in Quito) and in El Oro (especially in Machala), following is a province-by-province analysis.

THE EPIDEMIC IN QUITO

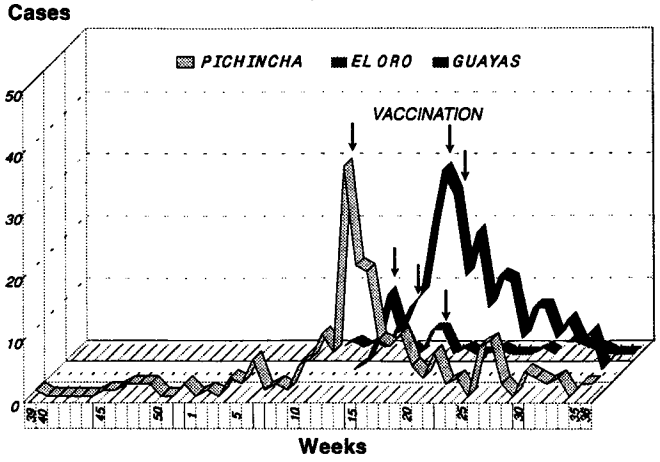
From week 29 of 1993 to week 26 of 1994, 190 cases were recorded in the province of Pichincha; of these, 184 were from Quito and six from other provinces. Of these 190 cases, four died, two in 1993 and two in 1994. From week 10, the epidemic took on greater proportions, reaching its peak in week 14, when 37 cases were reported, and gradually falling off after week 17 (Graph 2).

Of the total number of cases, 135 (71%) were confirmed by laboratory and 55 (29%) were confirmed on the basis of clinical epidemiological criteria.

In contrast to the epidemic in Guayas in 1984, where most cases were in the 5 to 14 years age group, in the recent epidemic cases were concentrated in the adult population, especially in the 15 to 44 years age group, which accounted for 81% of the cases, and which had an attack rate of 23.8 per 100,000. Of the 190 cases, 154 (90.6%) were in the persons over 15 years of, five (2.6%) were in children under 5 years, and 12 (6.3%) were in children ages 5 to 14 years.

DPT vaccination coverage in children under 1 year in Quito, was 95% in 1990; in prior years it had been about 70%.

Graph 2. Reported Cases of Diphtheria by Epidemiological weeks in the provinces of Pichincha, El Oro & Guayas (2) Ecuador, 1993 - 1994



(1) Up To Week 39 for 1993 And Week 36 for 1994
(2) from Week 1 to Week 36 1994
Source: **DPS De Pichincha , El Oro & Guayas**

Available data on vaccination in schoolchildren reveal that from 1986 to 1992 approximately 135,687 mixed child doses were administered. If we assume that this captive population received the primary series of DPT, it could mean that 42% of that group (from 5 to 14 years) received the booster on that occasion.

The increase in vaccination coverage in children, related to the progressive diminution of immunity in adults that ha been detected in some countries, could explain the changes that have occurred in the epidemiological profile of the diphtheria, with a shift in incidence to older groups. The recent epidemics in the countries of Eastern Europe exemplify this change.

A total of 41 persons (21.6%) reported they had received some dose of the diphtheria toxoid vaccine in one form or another, but they did not have the corresponding vaccine card; 28 reported that they had not been vaccinated; and in the rest of the cases they had no information in this regard.

Since the Td (adult) vaccine was not used in the routine vaccination scheme in Ecuador, national production had to be launched in the short term, albeit on a limited scale.Td vaccine had to be imported from foreign laboratories, with imports outnumbering nationally-produced doses. For this reason, at the beginning of the epidemic control actions were limited to vaccination to block spread of the disease and treatment of contacts.

It was only in week 14 that there were enough doses of Td vaccine for massive vaccination in the city. A total of 394,669 doses were administered in persons the 15 years and over age group, equivalent to 52% of that population. If we add to this the 154,297 doses administered before, accumulated coverage comes to 72.9% (548,966 doses). Coverage was 32% in the 5 to 14 years age group. The impact of this vaccination on the epidemic can be observed in Graph 2.

THE EPIDEMIC IN EL ORO

The province of El Oro has the highest incidence of diphtheria in the country, reporting 213 cases from weeks 13 to 27, for a rate of 44 per 100,000 population. Of these, 159 were in Machala.

DPT vaccination coverage in children under 1 year in Machala was high in recent years: 98% in 1990, 70% in 1991, 89% in 1992, 94% in 1993, and 37% for January to April 1994.

Beginning in week 13 incidence rose steadily, until peaking in week 21, when 33 cases were recorded(Graph 2).

All the cases were confirmed in the laboratory.

As in Pichincha, the cases were concentrated in adults, with an attack rate of 74 per 100,000 and 79.3% in the 15 to 44 years age group.

In Machala, due to the above-noted shortage of the vaccine, control actions to immunize the population over 5 years were only initiated in week 17. At that time, only 10%

(continued on page 8)

Reported Cases of Selected Diseases

Number of reported cases of measles, poliomyelitis, tetanus, diphtheria, and whooping cough, from 1 January 1994 to date of last report, and the same epidemiological period in 1993, by country.

Subregion and country	Date of last Report	Measles				Poliomyelitis		Tetanus				Diphtheria		Whooping Cough	
		Reported		Confirmed				Non Neonatal		Neonatal					
		1994	1993	1994	1993	1994	1993	1994	1993	1994	1993	1994	1993	1994	1993
LATIN AMERICA															
Bolivia	25 Jun.	...	...	577	223	0	0	...	...	12	8	5	4	34	38
Colombia	23 Jul.	...	...	68	...	0	0	...	...	...	...	...	...	...	...
Ecuador	31 Aug.	...	...	1 942	...	0	0	...	...	...	...	472	...	...	..
Peru	31 Aug.	...	...	272	...	0	0	63	...	88	...	34	...	1 030	...
Venezuela	13 Aug.	...	...	11 680	...	0	0	...	...	6	...	0	...	416	...
Southern Cone															
Argentina	09 July	316	...	44	...	0	0	...	...	...	...	...	...	...	...
Chile	18 June	83	...	0	...	0	0	...	...	...	...	...	...	...	...
Paraguay	30 July	76	...	56	...	0	0	...	...	...	...	...	...	...	...
Uruguay	12 Mar.	...	...	0	5	0	0	0	1	0	0	0	0	2	0
Brazil	18 June	...	...	428	...	0	0	423	...	76	...	120	...	1 495	...
Central America															
Belize	27 Aug.	27	6	0	...	0	0	...	...	...	...	...	...	...	...
Costa Rica	13 Aug.	193	440	30	158	0	0	2	...	0	...	...	...	9	...
El Salvador	23 Jul.	7 913	77	0	34	0	0	...	...	...	...	...	...	...	...
Guatemala	23 Jul.	227	247	204	13	0	0	...	...	...	...	...	...	...	...
Honduras	20 Aug.	10	85	1	11	0	0	8	...	3	...	0	...	2	...
Nicaragua	23 Jul.	638	372	1	316	0	0	...	...	...	...	...	...	...	...
Panama	23 Jul.	21	227	2	90	0	0	...	...	...	...	...	...	...	...
Mexico	27 Aug.	835	...	108	106	0	0	85	103	52	65	0	0	139	118
Latin Caribbean															
Cuba	28 May	...	...	...	...	0	0	...	...	...	...	...	...	...	...
Haiti	...	...	...	...	...	0	0	...	...	...	...	...	...	...	...
Dominican Republic	25 June	...	...	296	1 486	0	0	...	...	4	0	1	4	9	5
CARIBBEAN															
Antigua & Barbuda	27 Aug.	2	0	0	0	0	0	...	1	...	...	...	...	...	...
Bahamas	27 Aug.	4	0	0	0	0	0	...	0	...	0	...	0	...	0
Barbados	27 Aug.	28	3	0	0	0	0	...	0	...	0	...	0	...	0
Dominica	27 Aug.	7	8	0	0	0	0	...	...	...	...	...	...	...	...
Grenada	27 Aug.	16	3	0	0	0	0	...	...	...	...	...	...	...	...
Guyana	27 Aug.	7	1	0	0	0	0	...	...	...	...	...	...	...	...
Jamaica	27 Aug.	58	36	0	0	0	0	...	...	...	...	...	...	...	...
St. Kitts/Nevis	27 Aug.	4	0	0	0	0	0	...	...	...	...	...	...	...	...
St. Vincent	27 Aug.	2	0	0	0	0	0	...	...	...	...	...	...	...	...
Saint Lucia	27 Aug.	16	9	0	0	0	0	...	...	...	...	...	...	...	...
Suriname	27 Aug.	12	1	0	0	0	0	...	...	...	...	...	...	...	...
Trinidad & Tobago	27 Aug.	17	2	0	0	0	0	...	6	...	0	...	0	...	2
NORTH AMERICA															
Canada	26 Feb.	...	...	198	187	0	0	1	6	...	0	0	4	2 302	6 777
United States	30 July	...	...	777	...	0	0	21	...	...	...	0	...	1 761	...

... Data not available.

of the population had been vaccinated. In weeks 19 and 20, coverage increased to 61% and in weeks 22 and 23 it reached 88.7%. In that period (from April to June) 142,833 doses of Td vaccine were administered: 30,563 in the 5 to 14 years age group (69%) and 112,270 in the population 15 years and older (96%), for a total of 89% of the population over 5 years.

In contrast to Pichincha, the control hoped for has yet to be attained in Machala. There is barely a discrete decline in incidence, despite the high coverage attained in late June. More worrisome is the fact that of 143 cases, 72 (50%) reported having received one dose of Td vaccine and four reported having received two doses in the course of the campaign.

To date, the evaluation of the cold chain has not revealed any deficiencies, thus samples of the vaccines used were selected to study their potency. The results of this study are not yet available.

THE SITUATION IN GUAYAS

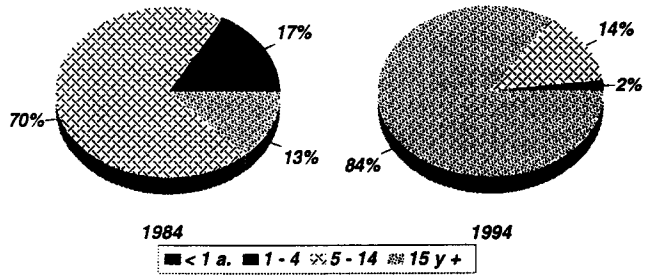
In Guayas, 22 cases were recorded from week 10 to week 26, all in Guayaquil. The distribution by weeks was homogeneous from the outset, except in weeks 15 and 18, when five cases were recorded. The last case occurred in week 25, after three weeks of no reports.

DPT coverage in children under 1 year in Guayaquil is high, reaching 98% in 1990, 70% in 1991, 89% in 1992, 94% in 1993, and 37% up to April 1994.

As for distribution by age, 5% of the cases were in the 1 to 4 years age group, 45% in the 5 to 14 years group, and 50% in the 15 to 45 years age group, showing a different pattern than the 1984 epidemic (Graph 3).

Due to the shortage of the Td vaccine and the priority accorded the provinces of Pichincha and El Oro, the control actions in Guayas were limited to perifocal vaccination and treatment of contacts.

Graph 3.PERCENT DISTRIBUTION OF DIPHTHERIA CASES BY AGE GROUPS GUAYAS, 1984 & ECUADOR 1993 - 1994*



* UP TO WEEK 35
1984: 46 CASES; 1993 & 1994: 518 CASES
SOURCE: **MINISTRY OF HEALTH**

MAIN ACTIVITIES CARRIED OUT

1. Informed the population on the epidemic and control measures, especially vaccination, through the mass media.
2. Intensified routine vaccination so as to increase vaccination coverage in children under 5 years.
3. Reviewed the standards for vaccination with diphtheria toxoid, extending the use of DPT up to 6 years and administering the Td (adult) vaccine beginning at 7 years.
4. Undertook massive vaccination campaigns with diphtheria toxoid, with emphasis on the adult population, especially in Quito and Machala.

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