

## INCIDENCE OF REPORTED POLIOMYELITIS IN 1954

For the United States as a whole, 38,741 cases of reported poliomyelitis occurred in all age groups during 1954, an incidence of 24.0 cases per 100,000 population. Although it was the fourth highest year on record, 1954 had slightly fewer reported cases than the 1949-53 average which showed a gross incidence of 25.7 cases per 100,000. This was largely due to the fact that the previous five-year average included 1952, the highest year on record. As usual, the 1954 cases were not uniformly distributed over the country; major excesses over the 1949-53 average were recorded for the northern mountain states, several of the south Atlantic states, and California. Florida and Massachusetts showed excesses of 256 and 37 percent, respectively, over the previous five-year average but a large proportion of their cases was associated with viruses other than poliomyelitis. On the other hand, Wisconsin and Minnesota reported considerably fewer cases in 1954 than they did on the average during 1949-53 (Table 91).

The Field Trial areas were selected initially because of consistently high incidence of poliomyelitis in the years 1949-53. During 1954, however, the number of cases was 11.3 percent less than the previous five-year average. The reduction was essentially the same in placebo areas, 10.5 percent, and in observed areas, 11.8 percent. About 23 percent of the national case load was reported from the study areas, whereas, the average proportion for 1949-53 was 26 percent. Nevertheless, the incidence rate for Field Trial areas was 22 percent higher in 1954 than that for non-trial areas. The rate in placebo control areas was 7 percent, and for observed areas, 36 percent higher than the rate for the rest of the United States (Table 92).

Although the number of cases in the study areas was not as great as anticipated, it appears that the basis for selection of the areas did result in identifying populations with higher attack rates on the average than the total rate for the rest of the nation. It is possible, no doubt, that the adequacy of case reporting was, because of interest in the program, greater in the study areas.

Figure 16 presents the number of cases of poliomyelitis reported by month of onset and by age group in the Field Trial areas for the years 1952, 1953, 1954. It illustrates the great variation in prevalence from year to year with 1952 presenting the largest number of cases on record. However, inspection discloses no marked shift in the age distribution of reported cases.

### INCIDENCE

#### AGES SIX TO NINE

The number of cases and percentage distribution of cases from June 15 to December 31 in the age groups represented in the study population are shown in Table 93. The percentage distribution in the ages 6 to 9 is essentially the same in 1954 as in the two previous years. Vaccination of about one-fourth of these children in placebo areas produced no distinct alteration in the distribution of cases by age. Similarly, vaccination of 36 percent of the 7-year-old children in observed areas did not reduce the gross percentage of cases at that age. Actually, in observed control areas there was a slight increase in the proportion of cases occurring among 7-year-olds; this may reflect the higher prevalence in 1954 or perhaps a greater effort to obtain reports of all cases in the study population during the Field Trial.

INCIDENCE OF REPORTED POLIOMYELITIS

Table 91

TOTAL REPORTED POLIOMYELITIS CASES, 1949-53 AVERAGE AND 1954,  
FOR THE UNITED STATES BY REGIONS AND STATES

State and Area	Reported Polio- myelitis Cases		State and Area	Reported Polio- myelitis Cases	
	1949-1953 Average	1954		1949-1953 Average	1954
United States - Total	39,468	38,741	South Atlantic (Cont'd.)		
			District of Columbia	111	86
New England - Total	1,706	1,911	Virginia	654	601
Maine	220	134	West Virginia	450	394
New Hampshire	81	94	North Carolina	554	732
Vermont	77	79	South Carolina	205	319
Massachusetts	756	1,034	Georgia	462	725
Rhode Island	130	122	Florida	501	1,784
Connecticut	442	448	East South Central - Total	2,286	2,314
Middle Atlantic - Total	5,534	4,795	Kentucky	764	824
New York	3,495	2,448	Tennessee	615	601
New Jersey	880	911	Alabama	396	374
Pennsylvania	1,159	1,436	Mississippi	511	515
East North Central - Total	9,316	8,349	West South Central - Total	4,448	4,558
Ohio	2,147	2,442	Arkansas	499	369
Indiana	840	845	Louisiana	554	538
Illinois	2,517	2,200	Oklahoma	821	561
Michigan	2,528	2,182	Texas	2,574	3,090
Wisconsin	1,284	680	Mountain - Total	1,968	1,827
West North Central - Total	6,477	4,525	Montana	162	182
Minnesota	1,887	683	Idaho	252	129
Iowa	1,418	1,450	Wyoming	119	273
Missouri	907	659	Colorado	571	390
North Dakota	217	119	New Mexico	217	232
South Dakota	378	140	Arizona	280	227
Nebraska	805	728	Utah	320	281
Kansas	865	746	Nevada	47	113
South Atlantic - Total	3,356	4,975	Pacific - Total	4,377	5,487
Delaware	50	88	Washington	681	474
Maryland	369	246	Oregon	414	377
			California	3,282	4,636

INCIDENCE OF REPORTED POLIOMYELITIS

Information on attack rates based on the estimates of the age-specific population is presented for each of these ages in Table 94. This table may be used in two ways: first, to view past experience of those aged 6-9 in 1954 who were the 5-8 cohorts in 1953 and the 4-7 cohorts in 1952; and second, to compare estimated incidence by individual years of age, 6-9, in the three successive years. The actual case rates by age in the registered study population are also presented.

In examination of these rates it must be recognized that the total populations by year of age are estimated by projection from the 1950 census and were used because no other data were available. The rates were compiled only in an effort to ascertain whether any major deviations occurred in the age distribution of poliomyelitis in 1954. The variations from year to year appear to be random; the pattern in 1954 is somewhat like that of 1952 although at lower rates. The rates in the reg-

Table 92

INCIDENCE OF POLIOMYELITIS  
FIELD TRIAL AND NON-FIELD TRIAL AREAS  
ALL AGES - 1949-1953 AVERAGE AND 1954

Area	Population - All Ages*		Reported Poliomyelitis Cases - All Ages			Case Rate Per 100,000 Population	
	Average 1949-1953	1954	Average 1949-1953	1954	Percent Change	Average 1949-1953	1954
United States - Total	153,384,000	161,195,000	39,468	38,741	- 1.8	25.7	24.0
All Field Trial Areas**	30,698,000	32,261,000	10,199	9,051	-11.3	33.2	28.1
Placebo Control	14,847,000	15,603,000	4,293	3,843	-10.5	28.9	24.6
Observed Control	15,851,000	16,658,000	5,906	5,208	-11.8	37.3	31.3
Non-Field Trial Areas	122,686,000	128,934,000	29,269	29,690	+ 1.4	23.9	23.0

\* 1949-1953 average populations were estimated by taking 1950 populations from the U.S. census and inflating by total U.S. percent increase from April 1, 1950, to July 1, 1951, as estimated by the Bureau of the Census. Similarly, 1954 populations were estimated by inflating 1950 figures by total U.S. percent increase from April 1, 1950, to July 1, 1954.

\*\* Included in Field Trial areas are all of Alameda County, California; Penobscot and Cumberland counties, Maine; and Berkshire, Essex, Franklin, Middlesex, Norfolk, Plymouth, Suffolk, and Worcester counties, Massachusetts; although parts of these counties were not included in the vaccine Field Trial. This was done because case reports for 1949-1953 are available only for the entire counties. In the previous presentation of this table in the Summary Report some areas were assigned to non-Field Trial areas for the 1949-1953 period and to Field Trial areas for 1954. In the present table these areas have been included with Field Trial areas for both periods. The population estimates for both periods have been added to the table.

INCIDENCE OF REPORTED POLIOMYELITIS

Table 93

POLIOMYELITIS CASES REPORTED JUNE 15 to DECEMBER 31, 1952, 1953, 1954  
IN 1954 STUDY AREAS BY AGE - FOR ALL CHILDREN, SIX THROUGH NINE YEARS  
PLACEBO AND OBSERVED AREAS\*

Age	1952		1953		1954	
	Number	Percent	Number	Percent	Number	Percent
Placebo Areas - All Ages	4,192	100.0	3,006	100.0	2,788	100.0
6-9 Years - Total	841	20.0	667	22.2	597	21.4
6 Years	273	6.5	218	7.3	182	6.5
7 Years	181	4.3	185	6.2	176	6.3
8 Years	218	5.2	136	4.5	148	5.3
9 Years	169	4.0	128	4.3	91	3.3
Observed Areas - All Ages	7,864	100.0	3,717	100.0	4,469	100.0
6-9 Years - Total	1,550	19.7	796	21.4	902	20.2
6 Years	470	6.0	282	7.6	290	6.5
7 Years	402	5.1	188	5.1	304	6.8
8 Years	356	4.5	162	4.4	159	3.6
9 Years	322	4.1	164	4.4	149	3.3

\* This table is identical to that presented in the Summary Report with the exception that the number of cases for each age group is now included.

istered study population are, however, accurate, based on actually identified population and reported cases; they follow much the same age pattern but are uniformly lower than the estimated rates of 1954 for the entire population, 6-9, of study areas.

Detailed comparisons are not, however, justifiable, nor is any implication intended as to the effect of vaccine upon the rates given. It should be noted that the rates for single years of age in the study population have been revised from those presented in the Summary Report: those for 7, 8, and 9 years in placebo areas were by typographical error recorded as the same as those in observed areas.

INCIDENCE IN STUDY POPULATION

A total of 1,656 reported cases was collected in the period May 1 to December 31, 1954, from the total population in study areas in the age groups 6 through 9. It must be remembered that the study population comprised only those children in the first, second, and third grades of schools which were involved in the vaccination program rather than being defined by the age of the children. Moreover, all schools eligible to do so did not elect to participate in the Field Trial and some study areas did not include the entire county in which they were located. For study member cases, age was recorded as of May 1, 1954,

INCIDENCE OF REPORTED POLIOMYELITIS

Table 94  
 POLIOMYELITIS MORBIDITY RATES BY SPECIFIC YEARS OF AGE AND BY COHORT AGES  
 VACCINE FIELD TRIAL AREAS - MAY 1 TO DECEMBER 31, 1952, 1953, AND 1954

Area by Age	1952 - Total Study Areas				1953 - Total Study Areas				1954 - Total Study Areas				1954 Study Population*				
	Estimated Population**		Reported Cases		Estimated Population		Reported Cases		Estimated Population		Reported Cases		Registered Population		Reported Cases		
	Number	Rate	Number	Rate	Number	Rate	Number	Rate	Number	Rate	Number	Rate	Number	Rate	Number	Rate	
<b>Placebo Areas</b>																	
4 Years	252,000	99	249														
5 Years	255,000	125	320	282	112	252,000	282	112									
6 Years	188,000	149	280	235	92	255,000	235	92	252,000	192	76	156,584	112	72			
7 Years	188,000	104	195	102	102	188,000	192	102	255,000	189	74	270,246	185	68			
8 Years	191,000	120	230	143	76	188,000	143	76	188,000	152	81	203,810	116	57			
9 Years	201,000	86	172	137	72	191,000	137	72	188,000	92	49	94,431	28	30			
Totals	1,275,000	113	1,446	989	92	1,074,000	989	92	883,000	625	71	725,071	441	61			
<b>Observed Areas</b>																	
4 Years	373,000	153	572														
5 Years	371,000	175	649	315	84	373,000	315	84									
6 Years	282,000	176	497	328	88	371,000	328	88	373,000	334	90	222,749	188	84			
7 Years	280,000	156	437	221	78	282,000	221	78	371,000	341	92	377,913	239	63			
8 Years	281,000	140	392	178	64	280,000	178	64	282,000	182	65	275,255	140	51			
9 Years	277,000	124	344	181	64	281,000	181	64	280,000	174	62	136,833	73	53			
Totals	1,864,000	155	2,891	1,223	77	1,587,000	1,223	77	1,306,000	1,031	79	1,012,750	640	63			

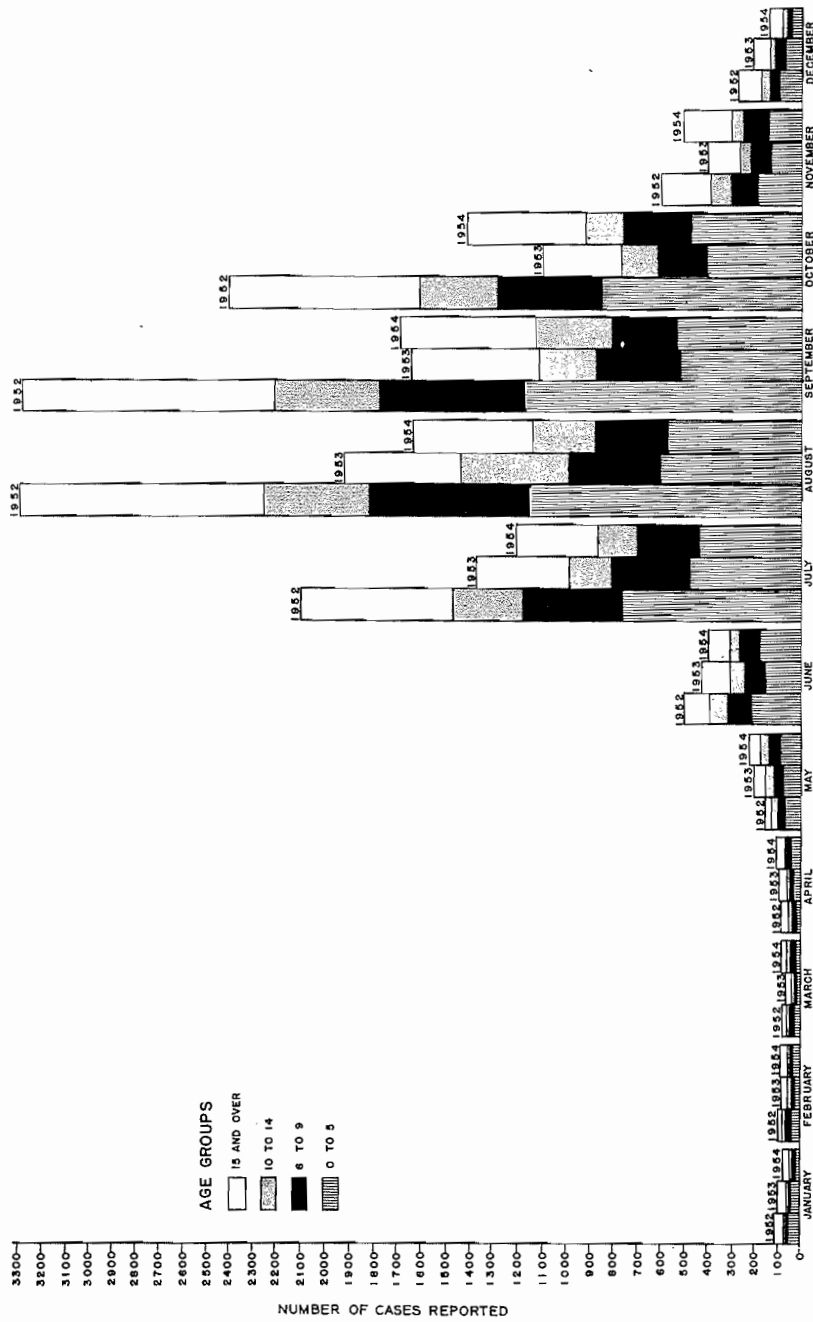
\* Study population consists of Grades 1, 2 and 3 in participating schools. Number of children in each age group is determined from VEC tabulations. Increase in actual 7- and 8-year-old population over estimated population for 1954 may be due to high post-war birth rate as well as inaccuracies of estimated figures.

\*\* Total study area population was estimated for each study area by finding population by age from 1950 census for ages 2 through 7 and advancing through cohorts to the years given. Since single years of age are not given for individual study areas, the combined ages (1 and 2, 3 and 4, 7 to 9) were broken proportional to the single years of age for the entire state. When the study area did not comprise an entire county, each age was taken proportional to the total population (all ages) for the part of the county comprising the study area. No correction was made for attrition or migration. Totals by age for all placebo areas and for all observed areas were found by summing over the constituent study areas.

Note: The previous Summary Report presentation of this table has been amended to include these population estimates and numbers of cases for each age. Certain inaccuracies in the calculations of rates have been corrected.

INCIDENCE OF REPORTED POLIOMYELITIS

Figure 16  
 NUMBER OF REPORTED POLIOMYELITIS CASES IN THE VACCINE FIELD TRIAL AREAS  
 BY SPECIFIC AGE GROUPS: 1952, 1953, AND 1954



INCIDENCE OF REPORTED POLIOMYELITIS

Table 95

AGE DISTRIBUTION OF REPORTED POLIOMYELITIS CASES  
IN SIX-THROUGH NINE-YEAR-OLD CHILDREN  
PLACEBO AND OBSERVED STUDY AREAS COMBINED

Age	Total Reported Cases		Study Cases		Nonstudy Cases			
					Family Associates		Not In Study Population	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
6-9 Years - Total	1,656	100.0	1,081	100.0	107	100.0	468	100.0
6 Years	679	41.0	300	27.8	89	83.2	290	62.0
7 Years	502	30.3	424	39.2	-	-	78	16.7
8 Years	294	17.8	256	23.7	-	-	38	8.1
9 Years	181	10.9	101	9.3	18	16.8	62	13.2

the beginning of the Field Trial, while in the rest of the population age was ordinarily that at time of onset. The study population contains, therefore, but a segment of the total 6-9 age group, together with small numbers of younger and older children who were in the first three grades of the participating schools.

The special weekly reports of all 6-9 cases were part of the total reports for complete counties and, as explained, were obtained as safeguards to ensure complete reporting, observation, and investigation of all study cases. The compiled list of 1,656 cases in children 6 through 9 years of age, contained 575 children who were not in the registered study population; they obviously did not belong among the study cases but that fact was carefully confirmed before their exclusion was permitted. Of these, 107 were non-study cases, 6-9 years of age, in family associates of study members; the remaining 468 were unrelated to the study population.

There were, therefore, 1,081 cases among children 6-9 years of age in the total study

population and, in addition, 22 cases in registered study children who were less than 6 or more than 9 years of age. These 1,103 cases constituted the total reported poliomyelitis cases in children of the first, second and third grades of participating schools in all study areas. Ninety-one of the reports, however, related to the cases in the total study population which occurred during the vaccination period, May 1 to two weeks after the third inoculations were completed in an area. The official study period had been specifically defined in advance to begin at that time and these cases were, therefore, excluded from the evaluation, although they were thoroughly studied.

The 1,012 cases reported in identifiable members of the study population during the official study period - essentially from mid-June to December 31, 1954 - comprise 428 cases among 749,236 children in placebo control areas and 584 among 1,080,680 children in observed study areas. They constitute the material with which analyses regarding the effect of vaccine were conducted.