

FOR RELEASE ON PRESENTATION
Wednesday Evening, December 28, 1955

1955 Poliomyelitis Vaccine Study
AGE DISTRIBUTION ANALYSIS

A Study of the Age Distribution of Poliomyelitis
in 21 States in 1955 and 1952^{1,2}

Supplementary Figures and Tables³

by

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 2. Prepared as supplementary material for a presentation before the 115th Annual Meeting of the American Statistical Association, New York City, December 28, 1955.
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Table 1

Age Distribution of Poliomyelitis for 21 States* in 1955 and 1952

Age	1955 (Preliminary Data, July 3 - October 31)							1952 (Calendar Year)						
	Population Estimates**	Cases*		Rates**		Adjusted**		Population Estimates**	Cases*		Rates**		Adjusted**	
		P	NP	P	NP	P	NP		P	NP	P	NP	P	NP
Under 1	1,651,000	100	25	6.1	1.5	5.5	1.3	1,539,000	374	122	24.3	7.9	5.2	2.9
1	1,611,000	210	45	13.0	2.8	11.8	2.5	1,505,000	833	264	55.3	17.5	11.8	6.3
2	1,570,000	229	115	14.6	7.3	13.2	6.5	1,441,000	908	360	63.0	25.0	13.5	9.0
3	1,523,000	223	189	14.6	12.4	13.2	11.1	1,446,000	878	474	60.7	32.8	13.0	11.8
4	1,500,000	191	253	12.7	16.9	11.5	15.1	1,449,000	824	535	56.9	36.9	12.1	13.3
5	1,444,000	198	254	13.7	17.6	12.4	15.7	1,561,000	826	691	52.9	44.3	11.3	16.0
0-5	9,299,000	1151	881	12.4	9.5	11.2	8.5	8,941,000	4643	2446	51.9	27.4	11.1	9.9
6	1,445,000	174	244	12.0	16.9	10.9	15.1	1,124,000	712	542	63.3	48.2	13.5	17.4
7	1,446,000	85	204	5.9	14.1	5.3	12.6	1,117,000	627	481	56.1	43.1	12.0	15.5
8	1,536,000	89	236	5.8	15.4	5.2	13.7	1,108,000	565	410	51.0	37.0	10.9	13.3
9	1,108,000	110	176	9.9	15.9	9.0	14.2	1,170,000	505	405	43.2	34.6	9.2	12.5
6-9	5,535,000	458	860	8.3	15.5	7.5	13.9	4,519,000	2409	1838	53.3	40.7	11.4	14.7
10	1,094,000	98	149	9.0	13.6	8.1	12.2	1,022,000	405	358	39.6	35.0	8.5	12.6
11	1,105,000	93	166	8.4	15.0	7.6	13.4	961,000	379	291	39.4	30.3	8.4	10.9
12	1,163,000	112	169	9.6	14.5	8.7	13.0	914,000	325	249	35.5	27.2	7.6	9.8
13	1,024,000	94	147	9.2	14.4	8.3	12.8	921,000	306	215	33.2	23.4	7.1	8.4
14	950,000	71	126	7.5	13.3	6.8	11.8	897,000	338	226	37.7	25.2	8.0	9.1
10-14	5,336,000	468	757	8.8	14.2	7.9	12.7	4,715,000	1753	1339	37.2	28.4	7.9	10.2
0-5+10-14	14,635,000	1619	1638	11.1	11.2	10.0	10.0	13,656,000	6396	3785	46.8	27.7	10.0	10.0
0-14	20,170,000	2077	2498	10.3	12.4			18,175,000	8805	5623	48.4	30.9		
15 plus	47,889,000	1346	1484	2.8	3.1			46,091,000	4403	2496	9.6	5.4		
Unknown		5	3						59	39				
Total	68,059,000	3428	3985	5.0	5.9			64,266,000	13267	8158	20.6	12.7		

*For states included and numbers of cases under age 15 by paralytic status from each state, see Table 2.

**Population estimates are for July 1, and were derived from data and methods provided by the Bureau of the Census. Rates are per 100,000 population. Adjusted rates are computed from actual rates by multiplying the rate for each age by a factor which will adjust the rate per 100,000 for the age group 0-5 + 10-14 for that year and paralytic status to 10.0; thus, the age distribution for the two years in the age groups not receiving vaccine are superimposed so that the relative rates for the two years in the age group receiving vaccine (ages 6-9, including most 1st and 2nd grade school children) can be compared. See Figure 2 and Table 4.

Table 2

Cases of Poliomyelitis and Estimates of Population under Age 15 for 21 States in 1955 and 1952

State and Region	1955 (Preliminary Data, July 3 - Oct. 31)					1952 (Calendar Year)				
	Population Estimates*	Poliomyelitis Cases**				Population Estimates*	Poliomyelitis Cases**			
		P	NP	U	Total		P	NP	U	Total
NORTH EAST										
Maine	279,000	50	37		87	256,000	68	21		89
New Hampshire	158,000	53	72	9	134	143,000	21	20	11	52
Connecticut	606,000	101	209		310	525,000	118	134	12	264
New York	4,109,000	554	808	162	1524	3,675,000	860	614	155	1629
Sub-Total	5,152,000	758	1126	171	2055	4,599,000	1067	789	178	2034
NORTH CENTRAL										
Illinois	2,548,000	248	312	107	667	2,301,000	1821	911	6	2738
Minnesota	979,000	73	158	4	235	893,000	1288	1203	55	2546
North Dakota	222,000	14	10		24	203,000	58	95	55	208
Nebraska	407,000	55	58		113	375,000	364	235	721	1320
Sub-Total	4,156,000	390	538	111	1039	3,772,000	3531	2444	837	6812
SOUTH										
Dist. of Columbia	193,000	13	22		35	178,000	27	70		97
Virginia	1,165,000	72	121	1	194	1,077,000	267	200	25	492
West Virginia	720,000	59	49	2	110	680,000	369	184	68	621
Georgia	1,302,000	65	44		109	1,221,000	306	22	77	405
Mississippi	813,000	34	44		78	802,000	310	137	160	607
Arkansas	654,000	45	41		86	646,000	180	106	21	307
Sub-Total	4,847,000	288	321	3	612	4,604,000	1459	719	351	2529
WEST										
Wyoming	101,000	3	12		15	92,000	35	42	18	95
Colorado	475,000	32	45	6	83	398,000	152	171	137	460
New Mexico	315,000	30	14		44	282,000	181	47	147	375
Utah	289,000	5	2	8	15	258,000	111	149	33	293
Washington	754,000	122	51		173	688,000	397	173	161	731
Oregon	495,000	107	49		156	451,000	205	87	10	302
California	3,586,000	342	340		682	3,031,000	1667	1002		2669
Sub-Total	6,015,000	641	513	14	1168	5,200,000	2748	1671	506	4925
TOTAL	20,170,000	2077	2498	299	4874	18,175,000	8805	5623	1872	16300

*See second footnote to Table 1.

**P - paralytic, NP - non-paralytic, U - unspecified.

Table 3

Adjusted Age-Specific Attack Rates* for Paralytic Poliomyelitis by Regions in 1955 and 1952
(1955 Data Preliminary, July 3 - October 31)

Age	NORTH EAST (4 states**)		NORTH CENTRAL (4 states**)		SOUTH (6 states**)		WEST (7 states**)		Oregon and Washington**		Ga., Miss., and W. Va.**	
	1955	1952	1955	1952	1955	1952	1955	1952	1955	1952	1955	1952
Under 1	4.1	3.1	4.7	4.8	10.2	7.1	5.5	5.3	3.5	2.9	12.4	8.3
1	10.6	8.0	8.8	11.6	13.6	15.2	14.0	11.6	14.9	8.4	13.5	16.3
2	15.0	11.6	10.5	12.8	11.6	17.4	13.1	12.8	10.5	10.5	13.2	17.2
3	13.4	14.0	13.1	11.6	11.6	16.3	13.5	12.5	11.5	11.7	9.6	17.6
4	11.5	13.3	9.0	11.8	14.3	11.4	11.7	12.6	10.5	12.3	16.7	12.2
5	13.2	11.5	14.5	12.1	11.4	9.4	10.5	11.4	8.9	12.9	9.1	8.4
0-5	11.2	10.2	9.9	10.7	12.1	12.7	11.3	11.0	9.9	9.7	12.5	13.2
6	10.0	15.7	9.0	12.4	10.1	11.4	13.3	15.2	14.8	16.0	10.0	10.8
7	4.5	12.4	7.6	12.3	6.1	9.7	4.3	12.7	5.2	14.0	5.1	10.0
8	5.1	12.8	5.0	11.7	6.2	8.6	5.1	10.4	4.9	11.3	5.2	8.8
9	10.2	10.5	9.4	10.4	6.8	6.3	8.4	8.7	6.8	11.2	7.1	5.9
6-9	7.2	12.8	7.6	11.7	7.3	8.9	7.8	11.8	8.0	13.1	6.8	8.8
10	8.3	10.5	8.0	10.3	7.3	5.8	8.6	7.0	9.8	7.3	6.9	5.4
11	7.0	10.5	9.7	8.6	6.3	4.7	7.7	9.5	9.8	13.2	6.1	3.8
12	9.4	8.7	11.6	8.5	5.8	4.0	7.7	8.3	10.4	10.7	4.6	2.5
13	8.5	7.8	10.2	7.8	6.6	5.9	7.7	6.6	12.6	9.5	6.4	5.1
14	5.7	10.2	11.0	8.1	7.1	6.0	5.3	8.5	8.3	12.2	6.8	5.7
10-14	7.8	9.6	10.1	8.7	6.6	5.3	7.5	8.0	10.2	10.5	6.1	4.5
0-5+10-14	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0

*For explanation of adjusted rates, see second footnote to Table 1. See also Figures 3 and 4 and Table 4.

**For states included and numbers of cases under age 15 from each state, see Table 2.

Table 4

Poliomyelitis Vaccinations in School Clinics
in 21 States in the Spring and Summer of 1955

Regions*	Number of 6-9 Year Olds*	Number of Vaccinees**	% of 6-9 Year Olds Vaccinated**	% of Vaccinees with Two Inoculations***
North East	1,429,000	672,279	47	26
North Central	1,150,000	548,614	48	4
South	1,321,000	677,063	51	39
West	1,634,000	688,538	42	45
Total*	5,534,000	2,586,494	47	30
Ore., Wash.	343,000	106,764	31	75
Ga., Miss., W. Va.	770,000	392,074	51	63

*For states included in each region, see Table 2. Population estimates of 6-9 year olds are for July 1, 1955, and were derived from data and methods provided by the Bureau of the Census.

**Program for first inoculations in school clinics (with vaccine provided by the National Foundation for Infantile Paralysis) completed by early July. Data on numbers of vaccinees provided by the NFIP. Vaccinees comprise mostly 1st and 2nd grade school children but also some 3rd and 4th graders who received placebo in the 1954 Field Trials. Percent of 6-9 year olds vaccinated assumes all vaccinees are 6-9 years old, which is an approximation. Omitted from the vaccinees are just over 200,000 children vaccinated in 1954 in these 21 states and a small number of children vaccinated with commercially distributed vaccine in 1955.

***Based on preliminary and incomplete data from the NFIP, September 14, 1955.

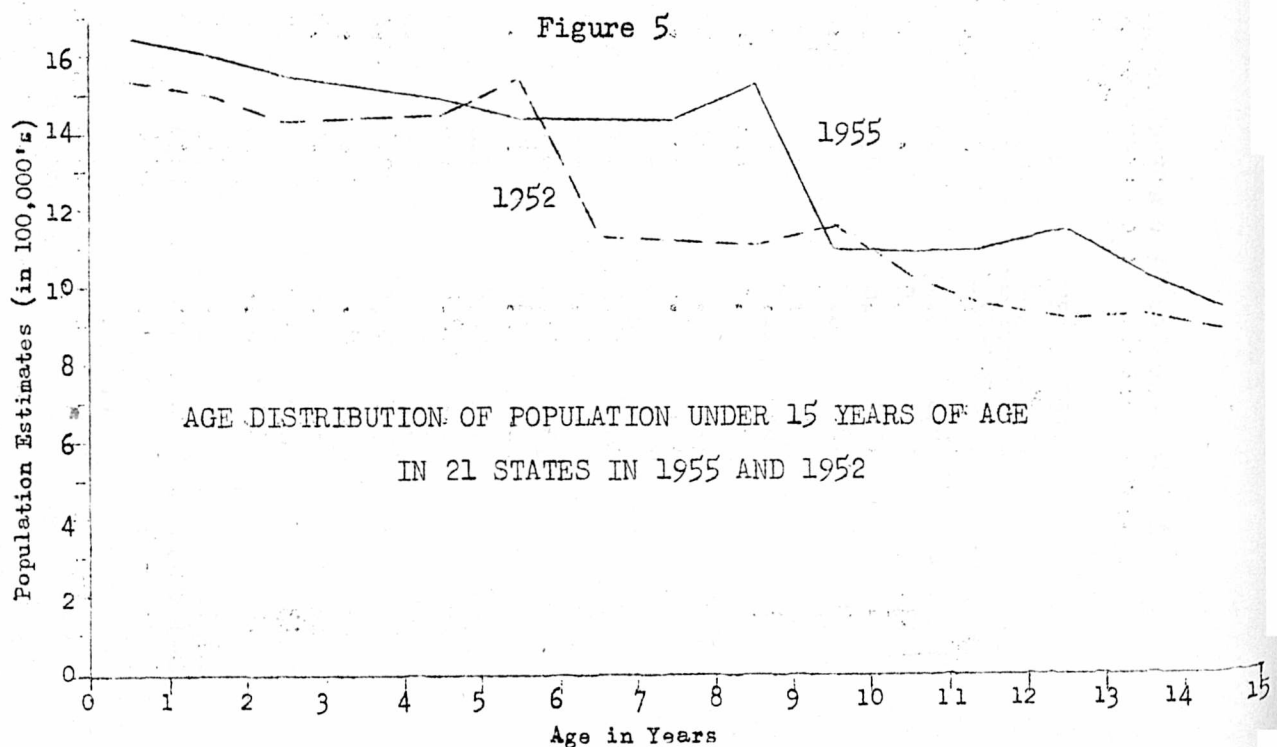


Figure 1: CURRENT U.S. POLIO INCIDENCE
COMPARED WITH YEARS 1952-1954

DATA PROVIDED BY NATIONAL OFFICE OF VITAL STATISTICS

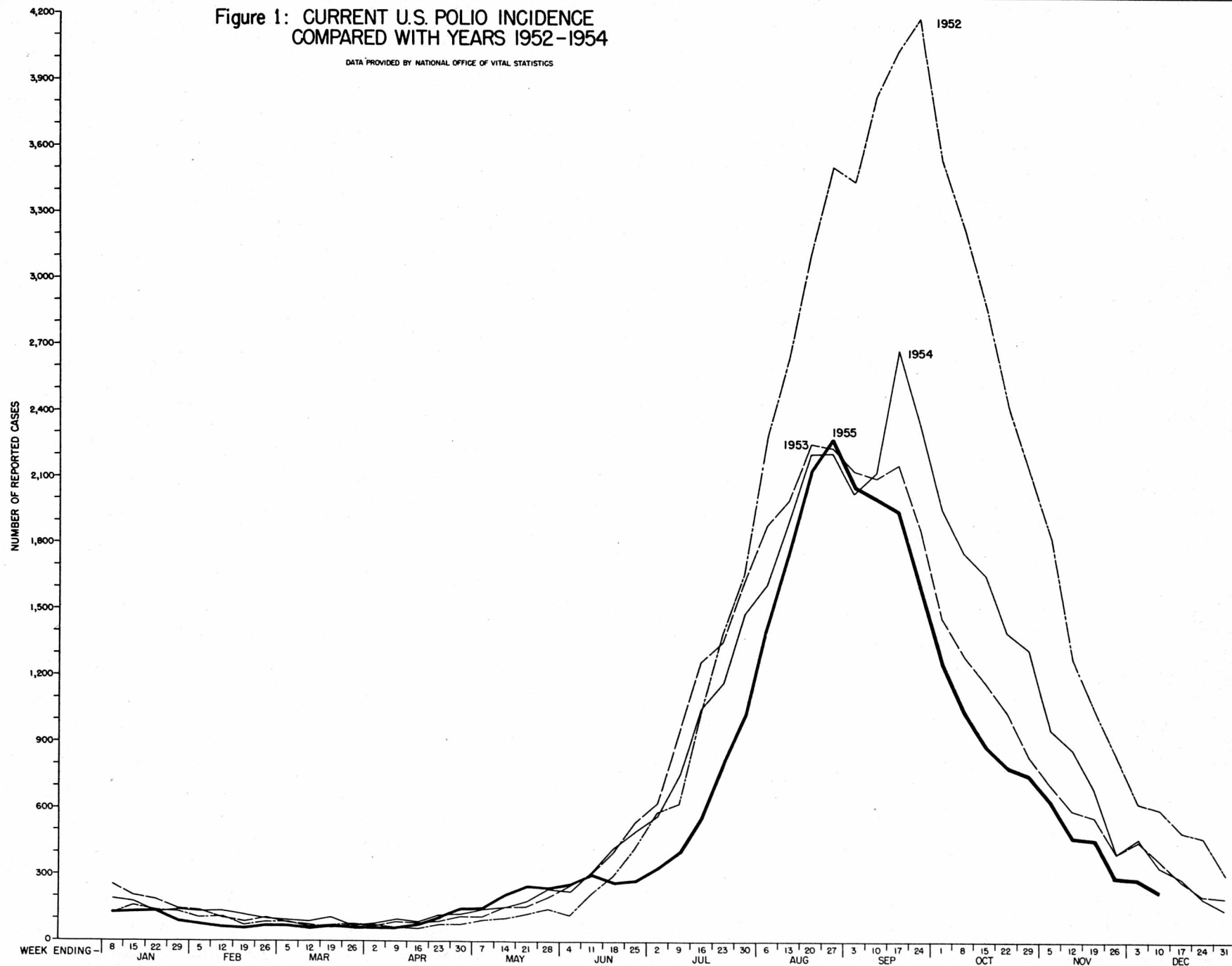


Figure 2: POLIOMYELITIS AGE-SPECIFIC ATTACK RATES
FOR 21 STATES IN 1955 and 1952
(1955 DATA PRELIMINARY - JULY 3 to OCTOBER 31)

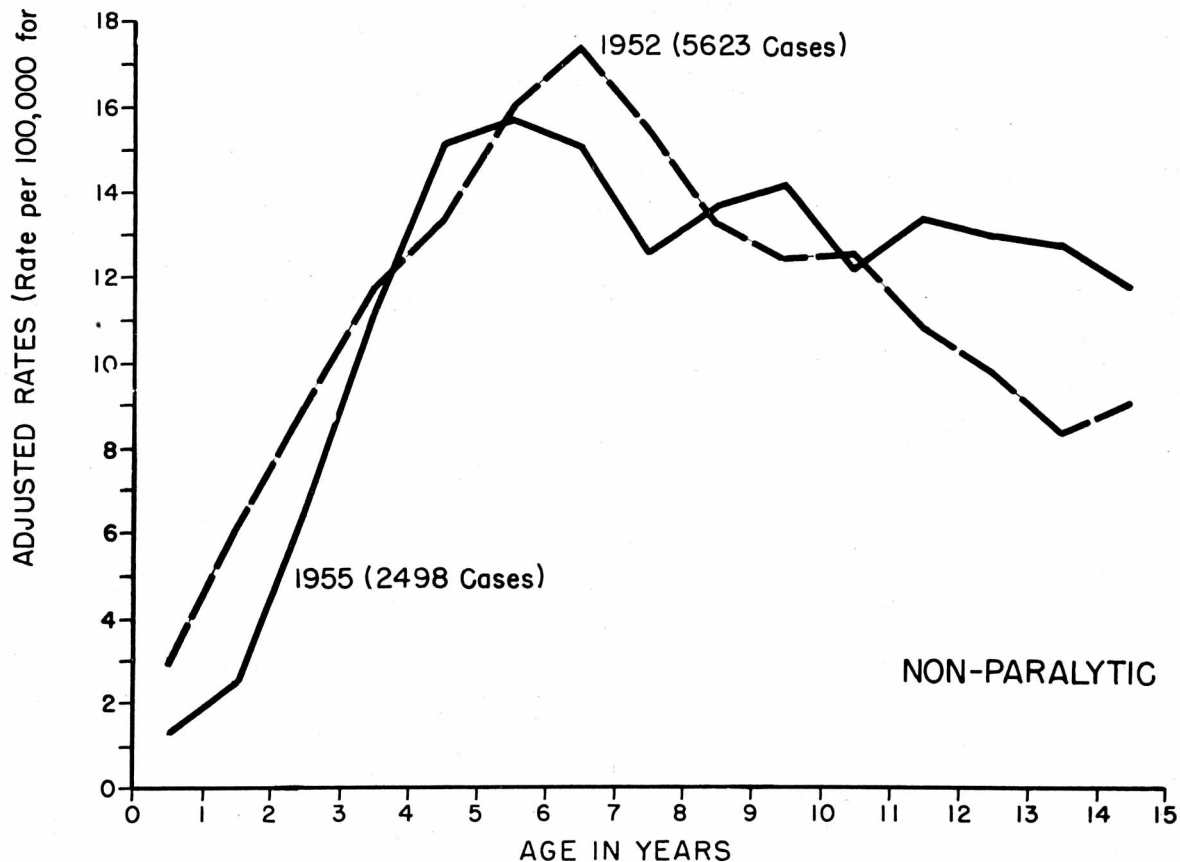
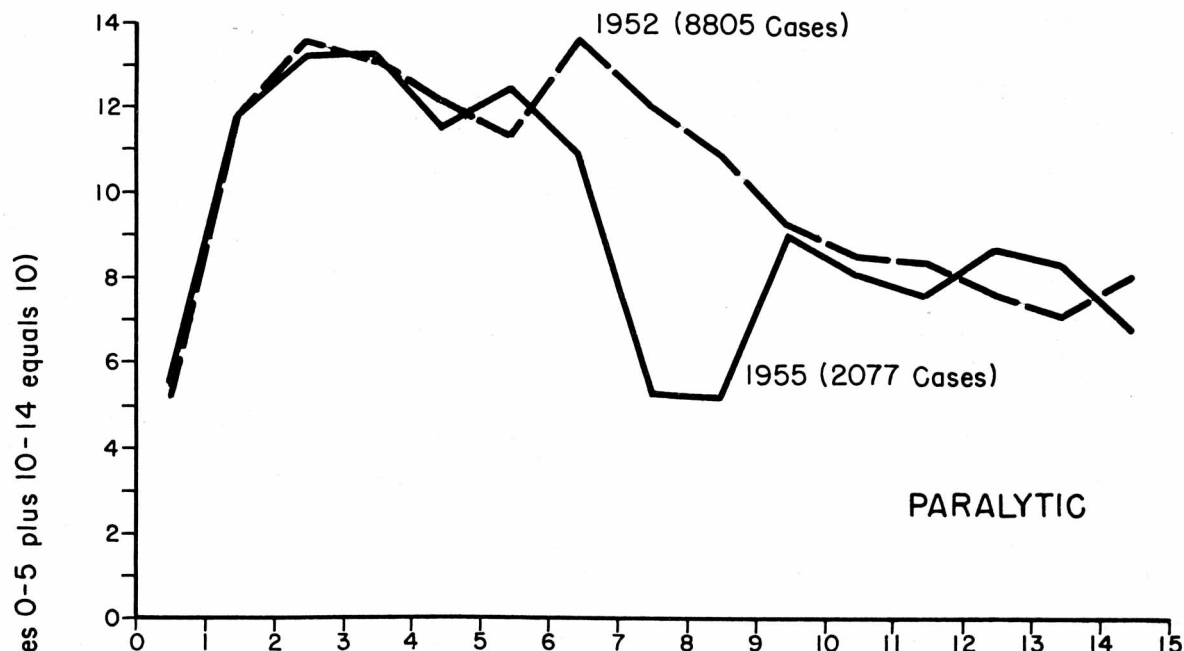


Figure 3: AGE DISTRIBUTION OF PARALYTIC POLIOMYELITIS IN 1955 and 1952 BY REGION
(1955 DATA PRELIMINARY - JULY 3 to OCTOBER 31)

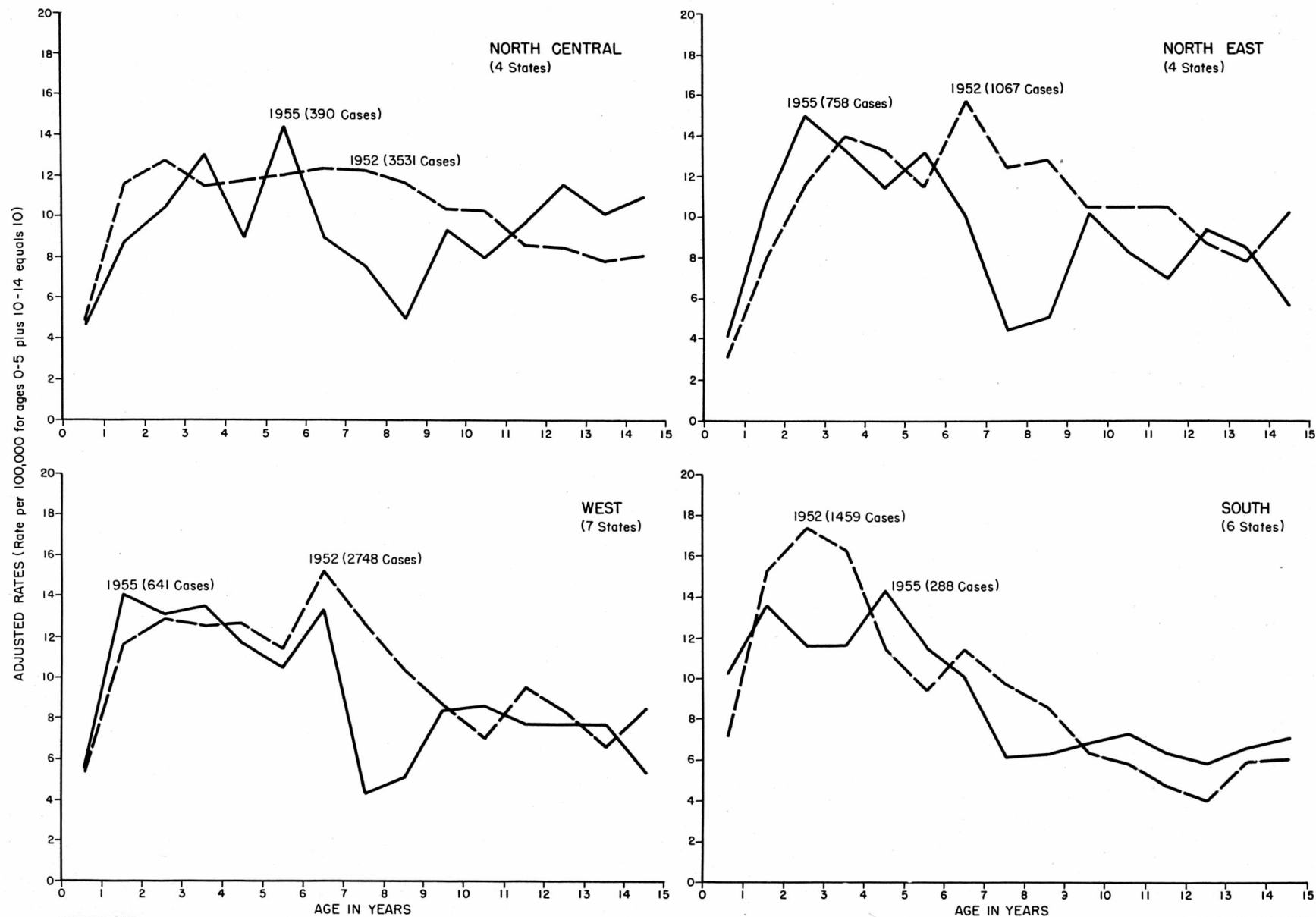


Figure 4: AGE DISTRIBUTION OF PARALYTIC POLIOMYELITIS
IN FIVE STATES WHERE
MANY VACCINEES RECEIVED TWO INOCULATIONS
(1955 DATA PRELIMINARY - JULY 3 to OCTOBER 31)

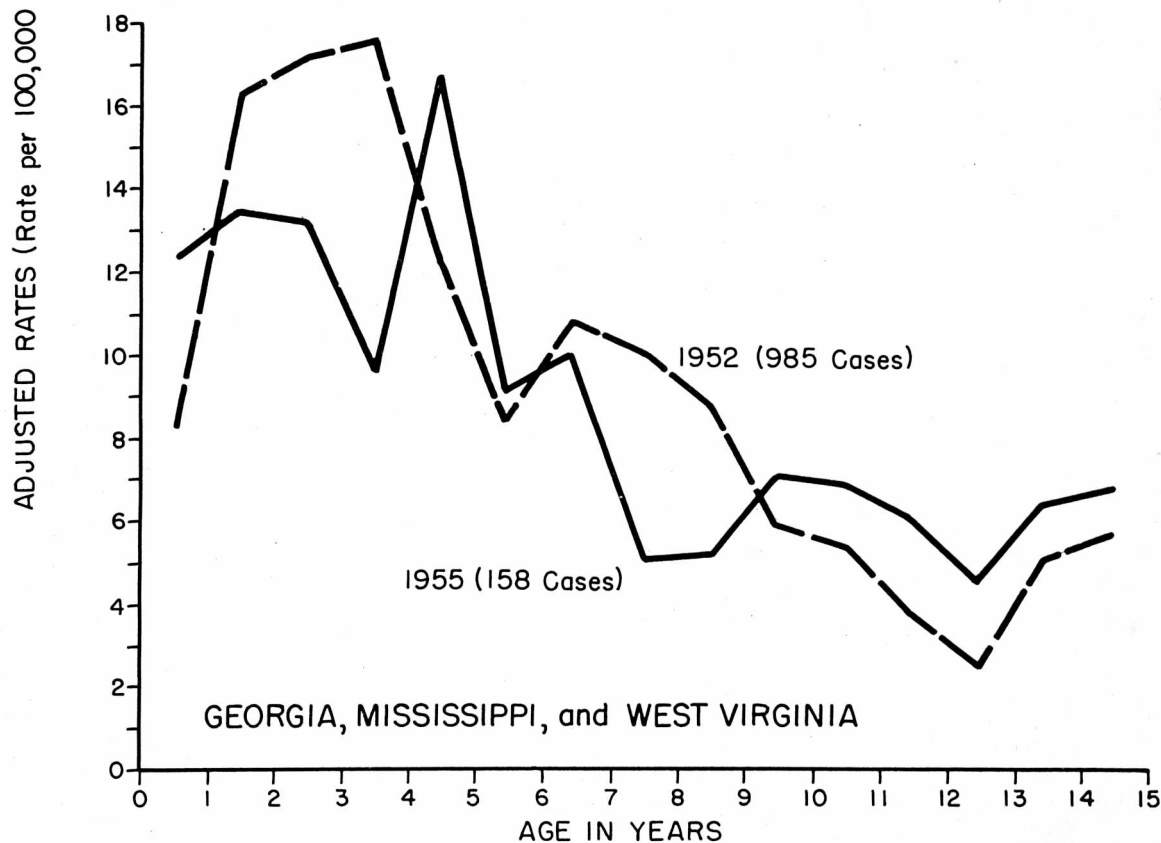
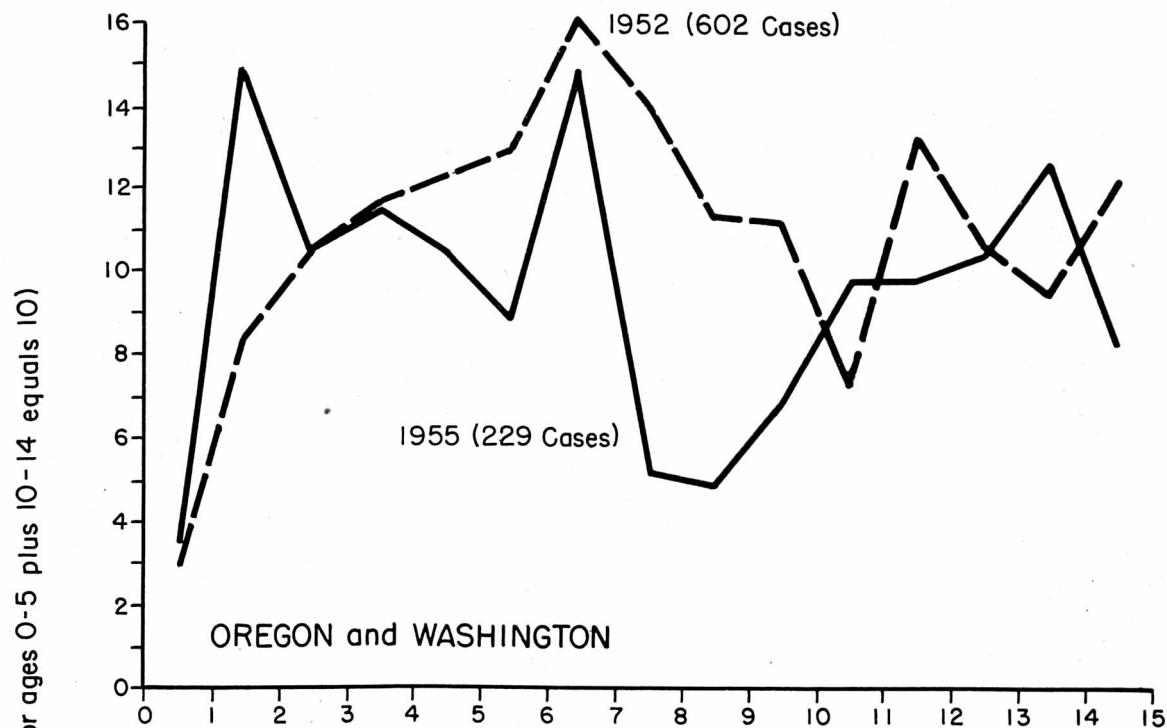


Table 1

Comparison of Reported* and Expected** Cases of Poliomyelitis
Among Children Who Received First Inoculations in School Clinics
between April 15 and May 7, 1955

Vaccine Mfr. and Number Vaccinated***			Onsets in Week Ending:									
			Apr. 23	Apr. 30	May. 7	May 14	May 21	May 28	June 4	June 11	June 18	June 25
CUTTER 303,000	Reported	P	4	16	6	1	1	1	-	1	2	-
		NP	2	2	7	3	-	-	1	1	2	2
	Total		6	18	13	4	1	1	1	2	4	2
	Expected Total		1	1	3	3	3	2	3	1	2	3
LILLY 2,514,000	Reported	P	2	4	3	3	4	3	2	1	2	3
		NP	2	2	5	7	9	13	4	6	11	8
	Total		4	6	8	10	13	16	6	7	13	11
	Expected Total		1	3	6	9	7	9	10	12	10	11
PARKE-DAVIS 860,000	Reported	P	-	-	-	1	1	1	1	-	1	-
		NP	-	-	-	-	1	5	3	1	2	-
	Total		0	0	0	1	2	6	4	1	3	0
	Expected Total		1	1	2	2	2	1	2	2	3	3
PITMAN-MOORE 411,000	Reported	P	-	-	-	1	1	-	3	-	-	1
		NP	-	-	1	2	1	-	-	-	1	-
	Total		0	0	1	3	2	0	3	0	1	1
	Expected Total		0	0	1	1	1	1	1	1	1	1
WYETH 775,000	Reported	P	-	1	3	1	3	1	2	1	-	-
		NP	-	-	-	2	2	-	-	-	1	3
	Total		0	1	3	3	5	1	2	1	1	3
	Expected Total		0	0	1	1	2	2	2	1	2	2

*Reported cases include only cases accepted by PSU through November 9 and who received first inoculations in school clinics (vaccine provided by the NFIP) April 15 through May 7, 1955.

**Expected cases among this group of children estimated from 1955 incidence of poliomyelitis (paralytic and non-paralytic) reported to the National Office of Vital Statistics by the states listed below. See note on back.

***Data on numbers of first inoculations are from the National Foundation for Infantile Paralysis. CUTTER vaccine was used during this period in Idaho, Nevada, Arizona, New Mexico, and southern California; LILLY vaccine was used in Texas, Oklahoma, Louisiana, Arkansas, Mississippi, Alabama, Tennessee, Florida, Georgia, South Carolina, North Carolina, Virginia, West Virginia, Indiana, and parts of Ohio, California, and Colorado; PARKE-DAVIS vaccine in Michigan, Illinois, Iowa, Wyoming, Utah, and part of Colorado; PITMAN-MOORE vaccine in Kentucky, Missouri, Kansas, and Nebraska; WYETH vaccine in Pennsylvania, Delaware, Maryland, District of Columbia, and part of Ohio,

Table 1 (Continued)

Vaccine Mfr. and Number Vaccinated	Cases	Onsets in Week Ending:									
		July 2	July 9	July 16	July 23	July 30	Aug. 6	Aug. 13	Aug. 20	Aug. 27	Sept. 3
CUTTER 303,000	Reported	P	-	-	2	-	-	1	-	1	-
		NP	1	3	-	-	1	3	1	1	1
	Total		1	3	2	0	1	4	1	2	1
	Expected	Total	3	3	4	3	3	4	4	5	4
LILLY 2,514,000	Reported	P	3	4	2	2	5	1	3	4	3
		NP	4	15	16	15	9	17	16	11	13
	Total		7	19	18	17	14	18	19	15	16
	Expected	Total	14	17	20	21	23	26	32	30	22
PARKE-DAVIS 860,000	Reported	P	4	-	-	2	2	1	3	1	1
		NP	1	3	9	13	8	8	4	8	3
	Total		5	3	9	15	10	9	7	9	4
	Expected	Total	3	6	7	11	15	19	26	22	24
PITMAN-MOORE 411,000	Reported	P	-	-	-	3	3	-	-	1	-
		NP	-	1	2	-	3	3	2	1	1
	Total		0	1	2	3	6	3	2	2	1
	Expected	Total	1	3	3	4	7	6	7	6	5
WYETH 775,000	Reported	P	-	3	-	-	-	-	3	1	-
		NP	3	2	2	1	1	2	-	3	8
	Total		3	5	2	1	1	2	0	6	9
	Expected	Total	2	2	4	5	6	10	11	15	10

Notes to Tables 1 and 2

The "expected" numbers represent rough estimates of the numbers of cases that would have occurred in the respective groups of first and second grade children if they had not been vaccinated. The estimates are made by assuming that about 10% of reported incidence would normally occur in first and second grade children (on the basis of past experience), and then adjusting for the percent of first and second grade children actually inoculated in each state. Cases reported to NOVS are predated one week to adjust these estimates from date of report to date of onset.

It must be emphasized that these data are, at best, approximations. Among the possible sources of error are: (1) "expected" incidence estimates are based on preliminary reports to NOVS which are subject to change; (2) estimates of the percent of eligibles inoculated may be in error; (3) the reporting of cases in vaccinated children is not complete. The size of the error involved is not known. However, the inaccuracies in the data should not grossly effect the relative comparison from week to week.

Table 2

Comparison of Reported* and Expected** Cases of Poliomyelitis
among Children Who Received First Inoculations in School Clinics
between May 8 and July 7, 1955

Vaccine Mfr. and Number Vaccinated***	Cases	Thru July	Onsets in Week Ending									
			July 2	July 9	July 16	July 23	July 30	Aug. 6	Aug. 13	Aug. 20	Aug. 27	Sept. 3
LILLY 234,000	Reported	P	1	1	-	1	-	-	-	-	1	-
		NP	1	-	-	-	-	1	-	1	-	2
	Total		2	1	0	1	0	1	0	1	1	2
	Expected Total	**		1	1	1	2	3	4	4	4	4
PARKE-DAVIS 1,382,000	Reported	P	17	4	4	5	4	9	8	13	5	6
		NP	19	8	15	25	14	29	23	42	16	28
	Total		36	12	19	30	18	38	31	55	21	34
	Expected Total	**		11	22	32	45	62	73	81	77	71

*Reported cases include only cases accepted by PSU through November 9 and who received first inoculations in school clinics (vaccine provided by the NFIP) May 8 through July 7, 1955, in the states listed below.

**Expected cases among this group of children estimated from 1955 incidence of poliomyelitis (paralytic and non-paralytic) reported to the National Office of Vital Statistics by the states listed below. No "expected" figures available for the period when vaccinations were in progress. See note on back of Table 1.

***Data on numbers of first inoculations are from the National Foundation for Infantile Paralysis. PARKE-DAVIS vaccine was used during this period for first inoculations primarily in Arizona, California, Connecticut, Massachusetts, Minnesota, New Hampshire, New York, North Dakota, Oregon, Rhode Island, Utah, Vermont, Washington, and Wisconsin; and LILLY vaccine primarily in California, Georgia, Indiana, Louisiana, Maine, Montana, New Jersey, North Dakota, Rhode Island, and South Dakota. About 12,000 first inoculations with PITMAN-MOORE vaccine were given during this period in Kansas, and from 20,000 to 30,000 first inoculations with WYETH vaccine were given during this period in Pennsylvania. Small amounts of vaccine from various manufacturers were used in other states and are not included in this table. Reported and expected comparisons for Pitman-Moore and Wyeth vaccinations for this period are given below. No Cutter vaccine was used during this period.

Cases with Onsets July 3 to September 3

Cases	PITMAN-MOORE	WYETH
Reported		
P	-	-
NP	-	1
Total	0	1
Expected Total	1	2

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Index to 1955 PSU Reports

<u>Contents</u>	<u>PSU Report Number</u>
1. Organization of Polio Surveillance	
General	1, 3, 7, 8, 29, 32, 35
PHS Press Releases	1, 3
Polio Reporting Officers	8
Reporting Procedures	3, 20, 35
Forms	3, 35
2. Schedule of Reports	
Daily Reports	1-28
Weekly Summaries	1, 7, 13, 17, 23, 27
Weekly Reports	29-55
Unpublished Report (tables without text)	31A
3. Polio Incidence	
Weekly Table & Figure begins	23
" " " " changes	29, 34
Weekly Polio Rates by States	39, 43, 48
4. Vaccine Associated Polio Cases	
Vaccinated Cases	
Cutter Cases Tabled	7, 8, 13, 17, 18, 23, 27, 29-32, 38
Nonparalytic Cases	20
Deaths	47
Tabulation by interval begins	30
Minor Illness in Vaccinees	15, 22, 30-32
Experimental Data	
Dose - Incubation Period	25
Monkey -- Human	29
Contact Cases	
Summary Tables	17, 23
Family Contact Cases	
First Mentioned	14
Tabular Summaries	14-35
Tabled by States	15-35
Community Contact Cases	
First Mentioned	21
Tabular Summaries	27-34
Tabled by States	28-35
5. Expected - Reported Table	7, 13, 17, 23, 27, 29-31, 31A, 32-43, 45
Special Summaries	37, 43
6. Effectiveness of the Vaccine	
Age Distribution Analysis	38, 40-48, 53
Nonparalytic Switch	40
APHA Paper	50
Report from Denmark	52

Index to 1955 PSU Reports (Continued)

Contents	PSU Report Number
Special Studies	50
California	40, 41, 44, 46, 50, 51, 54
Colorado	52
Connecticut	45, 50
Florida	44, 50
Georgia	50
Illinois	50, 53
Kentucky	52
Maryland	50
Minnesota	40, 50
Missouri	51
New York City	40, 45, 50
New York State	40, 42, 43, 48, 50
North Carolina	50
Oregon	50
Tennessee	55
Washington	43, 50, 52, 53
7. Polio Epidemics	
Massachusetts	37, 38, 40
New Hampshire	37-39, 43, 44, 48
Wisconsin	37, 40
8. Polio-Like Diseases	
Encephalitis	32, 33, 35, 37, 39-48 51, 52
Aseptic Meningitis	35, 37, 41, 42
9. Laboratory Reports	
Participating Laboratories	1, 2, 9, 39
Collection of Specimens	35
Tabulations of Data	51, 55
Isolations from	2, 3, 4, 7, 8-10, 14,
Vaccinated Cases (in text)	15, 17, 18, 20-30
Double Isolations	33, 36
Isolations from Cutter Vaccine	25, 31, 38, 51

Contents of 1955 Supplementary Reports

1. Special Report No. 1: Family Contact Cases (May 14, 1955)
2. Special Report No. 2: Community Contact Cases (May 14, 1955)
3. Summary of Cutter Cases (October, 1955)
4. The Wyeth Problem (August 31, 1955)
5. Expected - Reported Table (April 23 - September 3)
6. PHS Release on Vaccine Effectiveness (October 3, 1955)
7. APHA Paper: Polio Surveillance in 1955 (November 9, 1955)
8. Effectiveness of a Single Inoculation (December 7, 1955)
9. Preliminary Report on Age Distribution Analysis (December 21, 1955)