

POLIOMYELITIS SURVEILLANCE REPORT THIRD YEAR NO. 104 JANUARY 18, 1957

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U.S. Department of Health, Education and Welfare
Public Health Service Bureau of State Services

Communicable Disease Center
Poliomyelitis Surveillance Unit
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SPECIAL NOTE

The information in this report represents a factual summary of data reported to the Poliomyelitis Surveillance Unit from State Health Departments, Epidemic Intelligence Service Officers, participating Laboratories and other pertinent sources. All readers should be cautioned regarding the interpretation of these data, many of which are preliminary and provisional in nature. It is understood that the contents of these reports will not be released to the press, except by the Office of the Surgeon General, Public Health Service, U. S. Department of Health, Education and Welfare. State Health Officers, of course, are free to release any information they may wish concerning data from their state.

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Poliomyelitis in the United States in 1956.
(To be mailed separately on January 25)

I. Current Poliomyelitis Morbidity Trends

National poliomyelitis incidence fell during the first two weeks of 1957 to the lowest comparable two-week total since 1944. For the week ending January 5 there were 29 cases reported and for the week ending January 12 there were 47 cases reported to the National Office of Vital Statistics. Figure 1 shows the weekly incidence curves for 1956 and the four preceding years. Table 1 presents data for the past six weeks by state and region, with six-week totals for the previous four years. The South Central States continued to experience average incidence for this time of year, while other regions, especially the North East, have reported low incidence; also, California has reported particularly low incidence in recent weeks.

II. Registry of Triply-Vaccinated Polio Cases

Three-inoculation polio cases reported through January 15, 1957, have received the following classifications:

TRIPLY-VACCINATED POLIOMYELITIS CASES

Nonparalytic	154
Total Paralytic	34
Accepted (Listed in Table 2)	19
Possible Paralytic Cases, classification by State	9
Health Department pending for following reasons:	
A. First report incomplete, investigation underway	4
B. Paralysis questionable, awaiting muscle grading	4
C. Diagnosis of polio doubtful, awaiting lab results	1
Revoked (see below)	6

Paralytic cases are included in the listing when the Polio Reporting Officer indicates that they have been sufficiently documented to establish the diagnosis. Only those cases exhibiting definite residual paralysis or paresis after recovery from acute illness are included in the paralytic group. For paralytic cases, a transcript of a 60-day or convalescent muscle grading is requested, or lacking this, a detailed description from the attending physician of location and severity of residual paralysis. In addition, a detailed report of all other laboratory, clinical, and epidemiological data should be included.

Even after a case has been included in the listing of paralytic cases, further pertinent data may result in a change of classification. Since the Registry of Three-Inoculation Cases was initiated, six cases have been dropped for the following reasons: no residual paralysis on further muscle testing - three cases; found to be unvaccinated on follow-up inquiry - one case; classified not polio after laboratory testing - one case; and classified not polio after histopathological examination of CNS specimens - one case.

Cases for which data are not sufficient to justify a classification of paralytic polio are held pending further investigation. This includes cases for which the Polio Reporting Officer indicates there is doubt as to either the presence of residual paralysis, or the diagnosis of poliomyelitis. For all cases for which classification is pending, PSU continues to correspond with the Polio Reporting Officer until further reports permit definitive classification.

The criteria adopted for three inoculation paralytic cases are more stringent than those used in the routine reporting of poliomyelitis. For this reason it is not possible to directly compare this group of three inoculation paralytic cases with other groups of paralytic cases, vaccinated or unvaccinated.

The 19 cases now classified as paralytic three-inoculation cases appear in Table 2. These cases were reported from 15 states and territories. Paralysis was spinal in 14 cases, bulbospinal in one case, bulbar in three cases and unknown in one case. One case (bulbar) was fatal. Specimens for virus isolation were obtained on 16 of the 19 cases and results on these 16 were: poliovirus isolated - 7, nonpolio virus isolated - 2, negative - 3, and not yet reported - 4.

In the following table, the 19 paralytic cases are listed by intervals between inoculations and by manufacturer of vaccine used.

PARALYTIC THREE-INOCULATION POLIO CASES

3V Case No.	Interval Between			Manufacturer of Vaccine		
	1st & 2nd Inocu- lation	2nd & 3rd Inocu- lation	Last Inoc. & Onset	1st	2nd	3rd
3V-2	7 days	1 mo.	2 years	PD**	PD**	PD**
3V-3	1 mo.	7 mos.	24 days	?	?	L
3V-4	8 days	19 days	12 days	W	W	W
3V-5	21 days	7 mos.	5 mos.	W	W	W
3V-6	10 mos.	6 mos.	30 days	?	PM	PM
3V-7	4 mos.	6 mos.	10 days	?	?	L
3V-8	30 days	4 mos.	2 mos.	L	L	L
3V-9	4 mos.	3 mos.	5 mos.	PD	L	L
3V-10	5 mos.	9 mos.	1 mo.	W	PM	L
3V-11	8 days	1 mo.	2 years	PD**	PD**	PD**
3V-12	1 mo.	6 mos.	25 days	L	L	PD
3V-14	1 mo.	3 mos.	1 mo.	?	?	?
3V-16	1 mo.*	16 mos.*	8 mos.	PD**	PD**	PM
3V-19	2 mos.	11 mos.	4 mos.	?	?	L
3V-20	1 mo.	8 mos.	12 mos.	L	L	L
3V-21	2 mos.	6 mos.	1 mo.	PM	PM	PM
3V-23	14 days	6 mos.	2 mos.	L	L	L
3V-24	3 mos.	9 mos.	5 mos.	?	L	PM
3V-25	3 mos.	9 mos.	5 mos.	?	L	PM

*Three inoculations 1954, one in 1955.

**Field Trial Vaccine.

When these 19 cases are grouped by interval between next-to-last and last inoculation, there are three cases with intervals of two months or less, three cases with intervals of three to five months, and 13 cases with intervals of six months or more. Grouping cases by interval between last inoculation and onset shows that eight cases had onset within one month, seven cases had onset two to five months, and four cases had onsets six or more months after last inoculation.

For 18 of the 19 paralytic cases, the manufacturer of the vaccine used was known for one or more inoculations, and of these 18, two were inoculated in 1954 only. The remaining 16 cases received inoculations in 1955 and/or 1956 with vaccine produced by Lilly, Parke, Davis, Pitman-Moore, and Wyeth Laboratories.

III. Report from Minnesota on Vaccine Effectiveness in 1956

Drs. H. Kleinman and D.S. Fleming, Division of Disease Prevention and Control, Minnesota State Department of Health, have compiled the following preliminary report on the effectiveness of vaccine in Minnesota during the period August through October, 1956. Their contribution to this report is gratefully acknowledged.

The analysis is confined to the 0-19 age group during the three months, August 1 through October 31. The study was restricted to this period of high incidence in order to minimize biases introduced by studying changing population groups during periods of high and low risk. The study cases are shown by paralytic and vaccination status in Table 3. It should be noted that of the vaccinated paralytic cases, one had onset within 14 days of first vaccination, and probably had not had time to experience an immunologic response prior to illness. The classification of some cases may be changed as further clinical and laboratory data become available.

Detailed records have been kept on the use of polio vaccine in the State. These may be broken down as follows: 1) Vaccine given to first and second grade school children in NFIP-sponsored clinics. First doses were given in May and June, 1955 and second doses in September and October, 1955. 2) Vaccine purchased with funds provided by the Polio Vaccine Assistance Act and distributed by the State Department of Health from October, 1955 through October, 1956. Since the great bulk of vaccine used in Minnesota through October, 1956 was distributed in this way, detailed records permitted an accurate accounting of most vaccine used in the State. 3) Vaccine was first distributed through commercial sources in August, 1956, and although reports of exact usage of commercial vaccine may not be complete, total commercial supplies constituted less than five percent of the total used in Minnesota through October, 1956.

Over sixty percent of the population under 20 in Minnesota had received at least one inoculation by the end of October, and eighty percent of these had had second inoculations; less than ten percent of those with second inoculations had received their third dose. The proportions of the various age groups with one or more inoculations by the end of October are shown on the following page.

Age Group	Percent with One or More Inoculations (October 31)
0-4	73%
5-9	95%
10-14	51%
15-19	25%
0-19	64%

Thus it appears that vaccinations were concentrated in those parts of the 0-19 age group which have the greater expectancy of poliomyelitis. This would tend to bias rate comparisons against vaccine effectiveness.

Person-months at risk for vaccinated and unvaccinated populations were calculated from records on the numbers of inoculations given each month. Total vaccinated person-months at risk for any month is the average number of persons going through that month with one or more vaccinations. It is calculated as the total number of first inoculations given prior to that month plus one-half the number of first inoculations given during that month. The total population of the 0-19 age group (1955 estimate) is numerically equivalent to the total number of person-months at risk for each month. Unvaccinated person-months are found for each month by subtraction. By adding person-months at risk for the three months August through October, person-months at risk are found for the groups of vaccinated and unvaccinated persons. These totals are used to calculate the rates shown in Table 4.

The following summary is drawn from Table 4:

Vaccination Status	Person-Months at Risk	Paralytic		Effectiveness	
		Cases	Rates	Est.*	L.L.**
One Dose Only	554.8	6	1.08	41%	Neg.
Two or More Doses	1531.6	2	0.13	93%	75%
Total Vaccinated	2086.4	8	0.38	79%	57%
Unvaccinated	1305.9	24	1.84		

*Estimated Effectiveness: the difference between unvaccinated and vaccinated rates, divided by unvaccinated rate. More specifically, the rate in the vaccinated population is estimated to be 79% lower than the rate in the unvaccinated population; presumably, this difference is largely due to the vaccine.

**Lower Limit of Effectiveness: calculated at the 5% confidence level according to the method used by Francis, et.al., in Evaluation of 1954 Field Trials of Poliomyelitis Vaccine, Summary Report, Appendix, page 62.

Thus effectiveness of one dose only is estimated at 41% and for two or more doses at 93%. For the total vaccinated group (one or more doses), effectiveness is estimated at 79% with a lower limit of 57%.

IV. Paralytic Polio at Los Angeles County Hospital

Dr. Milford Wyman, Epidemic Intelligence Service Officer assigned to the California Department of Public Health, has compiled the following data, in collaboration with the staff of the Los Angeles County Hospital and local health jurisdictions in Los Angeles County. (These data are also summarized in California Polio Surveillance Release #15, for December 15, 1956.) It was the purpose of this study to analyze the severity of paralysis in vaccinated and unvaccinated poliomyelitis cases. All patients studied were observed at the Los Angeles County Hospital from January 1 through October 15, 1956.

Included in this study were 81 vaccinated and 501 unvaccinated polio cases; these cases are shown in Table 5A, by paralytic status and age group. Paralytic cases were classified as slight, moderate, or severe, on the basis of muscle gradings performed by qualified physical therapists at the time of hospital discharge. Cases with slight paralysis had at least 75% of normal strength in all muscle groups; cases with moderate paralysis had one or more muscle groups with 50-75% of normal strength but no muscles with less than 50% normal strength; and severe cases had less than 50% normal strength in one or more muscle groups. A follow-up grading made after hospital discharge showed that about 80% of patients with slight paralysis at discharge had no residual weakness 50-70 days after discharge. The following summary is drawn from Table 5A.

LOS ANGELES COUNTY HOSPITAL

Severity of Paralysis among Vaccinated and Unvaccinated Polio Cases

Age Group	Percent of Total Cases with No Paralysis		Percent of Paralytic Cases With Slight Weakness Only	
	V*	NV*	V	NV
0-4	33%	17%	**	29%
5-9	35%	30%	88%	47%
10-19	**	48%	**	42%
0-19	36%	28%	82%	35%
20 plus	**	33%	**	30%
Totals	38%	30%	80%	33%

* V-vaccinated, NV-not vaccinated.

** Small number of total cases (less than 15).

This summary table shows that 38% of vaccinated cases and 30% of unvaccinated cases developed no paralysis during hospitalization. A more striking difference between vaccinated and unvaccinated cases is seen when paralytic cases are classified as to severity. Among vaccinated paralytic cases, 80% showed slight weakness only, while among unvaccinated paralytic cases, only 33% showed slight weakness.

Additional information on the severity of vaccinated and unvaccinated cases is provided in Table 5B which shows the frequency of use of tracheotomies and respirators during hospitalization as well as the number of deaths among paralytic cases. Among 50 vaccinated cases there were no deaths and among 352 unvaccinated cases there were eight deaths (not a significant difference). An analysis of the frequency of use of tracheotomy and respirators is summarized below, based on data in Table 5B.

LOS ANGELES COUNTY HOSPITAL

The Frequency of Use of Tracheotomies and Respirators among Vaccinated and Unvaccinated Paralytic Poliomyelitis Cases

Age Group	Vaccinated			Not Vaccinated		
	Paralytic Cases	Tracheotomy &/or Respirator		Paralytic Cases	Tracheotomy &/or Respirator	
		Number	Percent		Number	Percent
0-4	10	2	*	140	11	7%
5-10	33	1	3%	45	9	20%
10-19	6	-	--	43	12	28%
0-19	49	-	--	228	32	14%
20 plus	1	-	--	124	53	43%
Totals	50	3	6%	352	85	24%

* Small number of total cases (less than 15).

Looking first at unvaccinated cases, the frequency of use of tracheotomy and/or respirator for paralytic cases age 20 and over was 43%, while it was 14% for the paralytic cases age 19 and under. Thus, comparison of vaccinated and unvaccinated cases should be made within a limited age group. Among paralytic cases age 5-9 there were 33 vaccinated cases, of which one (3%) required a tracheotomy. By contrast, of 45 unvaccinated paralytic cases age 5-9, nine (20%) required a respirator, with or without tracheotomy.

V. Routine Poliomyelitis Surveillance

The tabular summary lists the vaccinated cases with intervals of 30 days or less accepted January 1 through January 15. Two new cases were accepted, both nonparalytic. These cases appear in the table below by vaccine manufacturer and paralytic status, together with total cases vaccinated in 1956 with intervals of 30 days or less.

Poliomyelitis Cases with Onsets within 30 Days of a Vaccination in 1956
by Vaccine Manufacturer*** and Paralytic Status

Date of Report to PSU	L		PD		PM		SD		W	
	P	NP	P	NP	P	NP	P	NP	P	NP
CASES VACCINATED JANUARY TO JUNE 1956										
Totals through 1-15	55	37	5	2	10	5	0	2	3	4
CASES VACCINATED AFTER JUNE 1956										
Totals through 12-31	133**	167*	8	8	12	21	0	10	6	7
New Cases 12-31 to 1-15	0	1	0	1	0	0	0	0	0	0
Totals through 1-15	133	168	8	9	12	21	0	10	6	7
Grand Totals	188	205	13	11	22	26	0	12	9	11
	393		24		48		12		20	

*Including three cases associated with Lilly or Pitman-Moore and one with Lilly or Wyeth.

**Including one case vaccinated with part Lilly and part Wyeth vaccine.

***L - Lilly, PD - Parke, Davis, PM - Pitman-Moore, SD - Sharpe & Dohme, W - Wyeth.

VI. Vaccine Distribution

A summary of current and cumulative shipments of vaccine (in 1000's of cc's of net bottled vaccine) appears in Table 6. Vaccine shipments are still lagging considerably behind clearance, with almost 26 million cc's cleared but not shipped by December 28. Approximately 3 million cc's were shipped to public agencies and through commercial channels during December. Almost 2 million cc's were exported under the Department of Commerce export policy.

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Supplement: A Preliminary Report on the Surveillance of Poliomyelitis in the United States in 1956.

This report will be mailed under separate cover on January 25.

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The next PSU Report will appear on February 8, 1957.

(This Report was prepared by N. Nathanson, W.J. Hall, L.D. Thrupp, and H. Forester, with assistance from the Statistics Section, CDC.)

Table 1

TREND OF 1957 POLIOMYELITIS INCIDENCE

State and Region	Cases Reported to MOVs* for Week Ending:						Six Week Total	Comparable Six Week Totals in:			
	12-8	12-15	12-22	12-29	1-5	1-12		1955	1954	1953	1952
UNITED STATES	152	100	73	102	29	47	503	919	1223	1411	2320
NORTH EAST	11	9	4	11	-	4	39	175	312	261	219
Maine	-	-	-	-	-	-	-	4	3	8	10
New Hampshire	-	-	-	-	-	-	-	5	1	3	2
Vermont	-	-	-	-	-	-	-	2	25	8	1
Massachusetts	1	-	-	1	-	-	2	55	24	48	15
Rhode Island	-	-	-	-	-	-	-	7	1	6	9
Connecticut	-	2	-	-	-	1	3	9	15	12	7
New York	7	5	3	5	-	3	23	63	144	109	109
New Jersey	-	-	-	2	-	-	2	14	46	16	21
Pennsylvania	3	2	1	3	-	-	9	16	53	51	45
NORTH CENTRAL	44	27	19	31	5	5	131	186	342	360	870
Ohio	6	4	3	3	2	-	18	27	59	68	96
Indiana	12	4	5	6	-	1	28	16	21	16	28
Illinois	3	3	1	9	-	-	16	18	39	46	119
Michigan	4	3	5	4	-	-	16	21	78	79	164
Wisconsin	8	4	2	-	1	1	16	43	28	15	39
Minnesota	1	-	-	1	-	-	2	15	12	30	87
Iowa	1	-	-	1	1	-	3	14	50	20	62
Missouri	6	2	-	-	-	1	9	13	13	35	44
North Dakota	-	1	-	2	-	-	3	3	4	13	32
South Dakota	1	-	-	-	-	-	1	8	6	12	104
Nebraska	2	6	3	5	-	2	18	-	17	9	77
Kansas	-	-	-	-	1	-	1	8	15	17	18
NORTH WEST	9	8	4	4	3	-	28	84	90	88	125
Montana	3	2	1	1	-	-	7	10	16	21	14
Wyoming	-	1	-	-	-	-	1	1	10	8	7
Idaho	1	1	-	-	-	-	2	5	4	9	21
Washington	2	1	2	2	1	-	8	34	36	25	65
Oregon	3	3	1	1	2	-	10	34	24	25	18

* National Office of Vital Statistics

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Table 1 (Continued)

State and Region	Cases Reported to NOVS* for Week Ending:						Six Week Total	Comparable Six Week Totals in:			
	12-8	12-15	12-22	12-29	1-5	1-12		1955	1954	1953	1952
SOUTH EAST	29	16	19	17	1	8	90	95	156	192	248
Delaware	-	-	-	1	-	-	1	1	7	-	2
Maryland	2	1	3	-	-	-	6	5	9	18	12
D. C.	-	-	-	-	-	-	-	2	2	-	3
Virginia	2	-	1	5	-	-	8	10	7	9	19
West Virginia	-	-	2	1	-	-	3	5	5	17	12
North Carolina	7	4	3	-	-	-	14	20	28	21	49
South Carolina	3	3	1	2	1	2	12	4	7	8	6
Georgia	2	1	-	-	-	-	3	9	14	15	9
Florida	6	3	-	1	-	1	11	15	38	71	42
Kentucky	4	1	2	2	-	1	10	11	23	7	52
Tennessee	3	1	3	2	-	1	10	2	10	13	28
Alabama	-	2	4	3	-	3	12	11	6	13	14
SOUTH CENTRAL	35	20	17	21	7	16	116	135	100	138	112
Mississippi	7	-	1	2	1	2	13	7	10	7	8
Arkansas	5	2	1	4	-	-	12	6	12	10	7
Louisiana	1	3	4	3	1	4	16	21	13	11	28
Oklahoma	-	2	1	-	-	1	4	8	15	18	13
Texas	22	13	10	12	5	9	71	93	50	92	56
SOUTH WEST	24	20	10	18	13	14	99	244	223	372	746
Colorado	1	2	-	2	1	-	6	8	7	6	37
New Mexico	2	2	-	2	-	1	7	3	5	5	27
Arizona	1	-	-	1	-	-	2	9	3	7	30
Utah	3	1	2	-	3	1	10	4	22	17	71
Nevada	-	-	-	1	1	-	2	8	4	3	28
California	17	15	8	12	8	12	72	212	182	334	553
TERRITORIES											
Alaska	-	-	-	-	-	-	-	-	12	17	21
Hawaii	-	1	-	-	-	-	1	24	3	25	5
Puerto Rico	-	-	-	-	-	-	-	2	95	8	7

* National Office of Vital Statistics.

Figure 1: CURRENT U.S. POLIO INCIDENCE
COMPARED WITH YEARS 1952-1955

DATA PROVIDED BY NATIONAL OFFICE OF VITAL STATISTICS

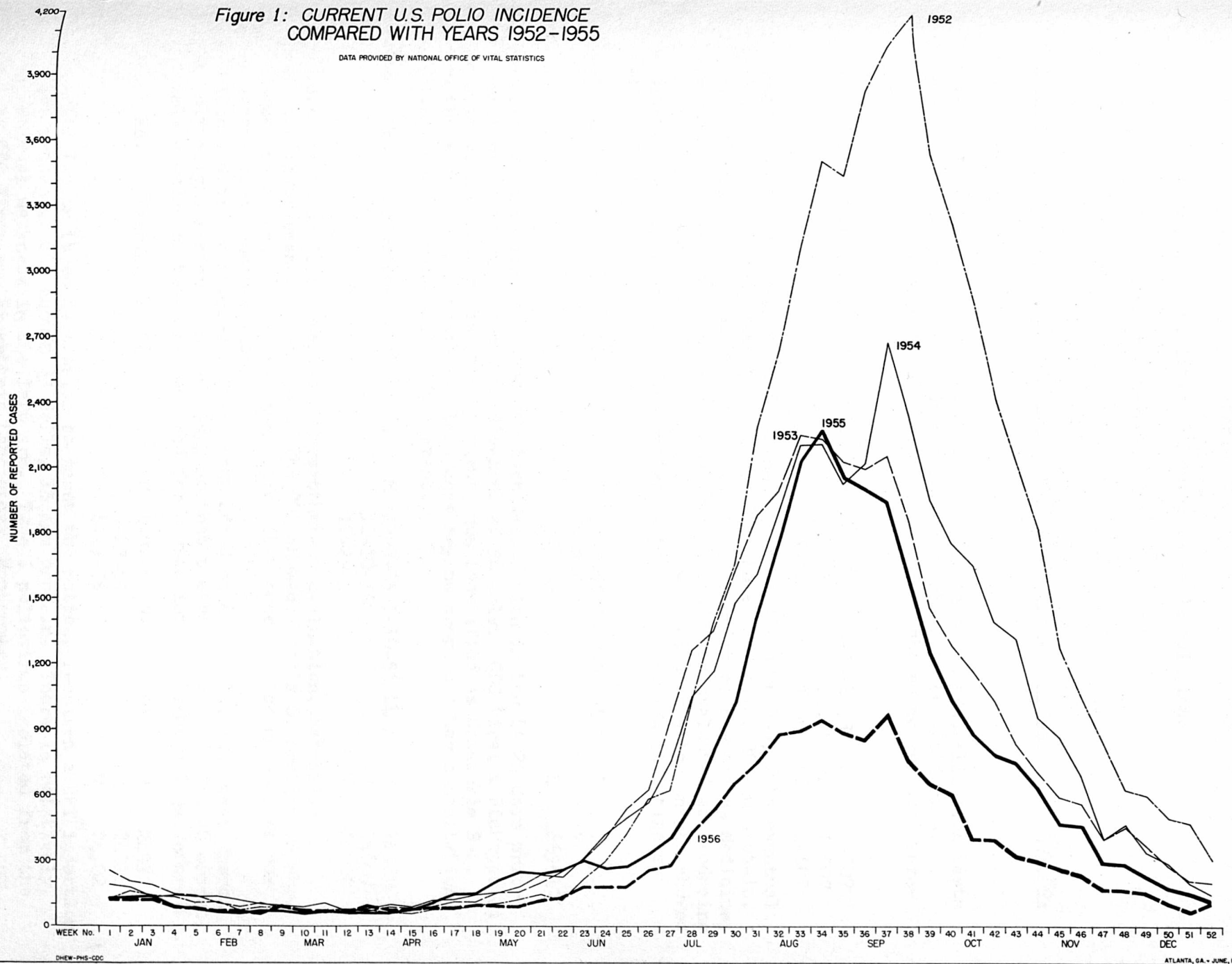


Table 2

Paralytic Poliomyelitis Following Three Inoculations

(Reports through January 15, 1957)

3V Case No.	State	County	Ini- tials	Age	Sex	Dates of Inoc.	Date 1st Symp.	Site of Para.	Mfr.	Lot No.
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3V-1 DROPPED.

Comment: Three stool specimens, complement fixation and neutralization tests were negative for polio. Influenza titers have shown a four-fold rise. Muscle evaluation on 6-6-56 (3½ months after onset) showed no residual paralysis.

3V-2	Conn.	Hartford	NC	10	F	5-5-54	8-26-56	LA, RA	PD	1-507
						5-12-54		LL, RL	PD	1-507
						6-9-54		Trunk	PD	1-507

Comment: Onset of weakness in RL on 8-29, hospitalized on 9-9, with eventual quadriplegia and trunk weakness. CSF on 9-9 showed 20 cells, 89 mgm protein. Type I poliovirus isolated by Virus Laboratory, Section of Preventive Medicine, Yale University Medical School. Field Trial Lot 507 was evaluated as producing poor antibody response. PT examination on 10-9-56 (45 days after onset) showed involvement of trunk and all extremities, with a score of 172 (470 highest possible score).

3V-3	Ga.	Bibb	EJB	4	F	11-5-55	7-27-56	RL	?	?
						12-2-55			?	?
						7-3-56		L	663617	

Comment: This patient received her last vaccination in the LA 24 days prior to onset of polio with severe involvement of RL only. CDC Viral & Rickettsial Laboratory, Montgomery, isolated a virus, now identified as Coxsackie B-4, from the stool of this patient. This case may be dropped after consultation with the Georgia State Health Department.

3V-4	Me.	Aroostook	DTW	4	M	12-2-55	1-10-56	LL	W	24009
						12-10-55			W	24009
						12-29-55			W	24009

Comment: This patient received a physiotherapy evaluation, establishing paralytic involvement of left leg. The CSF showed: cells 0, protein 12 mgm. The case was not reported until some time after onset and so no request for laboratory specimens was made.

Additional Note: Orthopedic consultant noted on August 16, 1956 that there was only slight residual in left leg, so that the gait was good without braces, and only a wedge on heel was required for correction of slight valgus deformity.

3V-5	Md.	Washington	CLS	4	F	9-7-55	9-23-56	LA	W	24012
						9-28-55			W	24012
						4-27-56			W	24702

Comment: Two or three days prior to onset the patient received a DPT injection in left triceps. CSF showed 33 cells, 15 mgm protein. There is relatively mild residual weakness in the left arm. Type I poliovirus isolated from the stool by CDC Virus and Rickettsia Laboratory, Montgomery.

Table 2 (Continued)

3V Case No.	State	County	Ini- tials	Age	Sex	Dates of Inoc.	Date 1st Symp.	Site of Para.	Mfr.	Lot No.
3V-6	Md.	Washington	PSD	8	F	4-?-55	9-9-56	RL,LL	?	?
						2-?-56			PM	?
						7-8-56			PM	?

Comment: CSF showed 338 cells, 30 mgm protein. Paralysis of both legs was moderately severe on 9-24-56. Type I virus isolated from stool by CDC Virus and Rickettsia Laboratory, Montgomery. Muscle grading on 11-8 (2 months) revealed no involvement of bulb or upper extremities. Back: fair, abdominal muscles: poor, right hip: poor, right lower leg: very poor, left hip: poor, left lower leg: poor.

3V-7	Michigan	Lenawee	PD	12	M	11-5-55	9-13-56	?	?	?
						3-17-56			?	?
						9-3-56			L	676312

Comment: Type I poliovirus isolated from stool by Dr. Gordon Brown, University of Michigan. Data on extent and severity of paralysis will be reported by Dr. Leeder, Michigan Department of Health.

3V-8	N.Y.	Manhattan	SM	11	F	12-?-55	6-25-56	RA,LA	L	657200
						12-?-55		RL,LL	L	657200
						4-?-56		Trunk	L	657200

Comment: CSF showed 65 cells, 212 mgm protein. This patient developed intercostal and diaphragmatic involvement, requiring a tracheotomy and respirator during acute illness. A muscle evaluation done on 9-29-56 showed no bulbar involvement, mild involvement of the arms and severe involvement of the trunk and legs, with a score of 135 (29%). Type I poliovirus was isolated from the stool by Dr. Ward (N.Y. City Health Department Laboratory).

3V-9	N.Y.	Brooklyn	SJ	9	F	5-19-55	4-28-56	LA,RA	PD	029129
						9-27-55		LL,RL	L	?649348
						12-?-55		Trunk	L	657200

Comment: This patient developed fever on 4-28, with paralysis beginning 4-29. Meningeal signs were minimal and three CSF examinations were done; 5-1; cells 7, protein 32 mgm, 5-4; cells 5, 5-15; cells 9. Two stools were negative for virus in Dr. Ward's Laboratory (N.Y. City Health Department). Paralysis progressed to involve all extremities without bulbar signs. Physiotherapy evaluation on 5-15-56 showed severe involvement of all extremities and trunk, with an approximate score of 276 (59%).

3V-10	Ohio	Cuyahoga	JD	8	M	5-?-55	8-27-56	LL,RL	W	23704
						10-?-55			PM	175-044
						7-7-56			L	663619

Comment: This case admitted to Cleveland City Hospital, where CSF showed 122 cells (75% monocytes) and 70 mgm protein. Moderate residual paralysis of both legs found by PT exam on 10-30-56. Poliovirus Type I has been isolated from the stool by Dr. Frederick Robbins, Cleveland City Hospital.

Table 2 (Continued)

3V Case No.	State	County	Ini- tials	Age	Sex	Dates of Inoc.	Date 1st Symp.	Site of Para	Mfr.	Lot No.
3V-11	Washington	Kitsap	MLB	11	F	4-27-54 5-4-54 6-1-54	9-14-56	Bulbar	PD	10361-BA 10361-BA 10361-BA

Comment: CSF showed 84 cells (84% lymphocytes), protein 97 mgm. Patient had mild bulbar polio with involvement of cranial nerves IX and X (difficulty swallowing, regurgitation through nose, and nasal voice). Stool and blood specimens were obtained but results are not available at present. Field Trial Lot 503 (PD 10361-BA) was evaluated as producing poor response. A convalescent muscle grading on 11-28 showed mild residual weakness of neck and trunk, with questionable minimal weakness of right arm and left leg.

3V-12	Puerto Rico/Arecibo	CMR	2	M		11-16-55 12-16-55 6-13-56	7-8-56	RL,LL, Trunk	L	658251 658251 029860
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Comment: No CSF examination done. Stool specimens collected 7-12 was negative for virus. Blood was obtained on 7-14 and 7-26 and both specimens showed following neutralizing antibody titers: Type I: 32, Type II: 32, Type III: 16. Dr. E.L. Matta reports that, although improved, the patient will have residual paresis of legs.

3V-13 DROPPED.

Comment: This fatal case was originally reported by her parents to have received three inoculations. On further investigation the family admitted misrepresentation of the facts, and it was determined that this patient had never been vaccinated.

3V-14	Indiana	Lake	JBP	5	M	3-?-56 3-26-56 6-8-56	7-13-56	Bulbar	?	?
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Comment: Died on 7-14-56. Illness began on 7-13 with fever. On 7-14 when the attending physician (who is also the local health officer) was first called to see the patient, he found the child in extremis, and ordered immediate hospitalization. The patient expired within 30 minutes of admission. Although the physician's impression was bulbar polio, the diagnosis appeared uncertain, and an autopsy was performed by the coroner, who returned a diagnosis of poliomyelitis. Since the calvarium was not opened, the central nervous system was not examined. This case will continue to be carried as bulbar polio, although, in the absence of neuropathologic or virologic studies, it is impossible to definitely confirm this diagnosis.

3V-15 DROPPED

Comment: No residual paresis on convalescent muscle grading.

3V-16	Kansas	Johnson	VZ	9	M	5-6-54 5-13-54 6-10-54 10-20-55	8-20-56	Bulbar	PD	507 507 507 175009
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Table 2 (Continued)

3V			Initials	Age	Sex	Dates of Inoc.	Date of 1st Symp.	Site of Para.	Mfr. Lot No.
Case No.	State	County	Initials	Age	Sex	Dates of Inoc.	Date of 1st Symp.	Site of Para.	Mfr. Lot No.

Comment: Onset of bulbar symptoms on 8-23-56, three days after fever, stiff neck and stiff back were first noted. This patient had involvement of Nerves IX, X, and XII, with difficulty in swallowing, deviation of tongue, and respiratory irregularity. The patient was hospitalized 8-23 and discharged 9-5, with mild bulbar involvement. No spinal fluid examination was done. Type I poliovirus was isolated from the stool by the Virus Laboratory, Kansas City Field Station, CDC, USPHS.

3V-17 DROPPED.

Comment: Muscle spasm during acute phase caused apparent weakness, which disappeared during convalescence.

3V-18 DROPPED, nonparalytic.

Comment: Examination by a certified orthopedic specialist on 12-21-56 (2 months after onset) revealed complete functional recovery of all muscle groups.

3V-19	Ala.	Walker	JGU	8	M	4-18-55	9-2-56	Bulbo-	?	?
						6-24-55		Spinal	?	?
						5-12-56		L	671700	

Comment: A stool specimen from this patient is now on test at the CDC Virus and Rickettsia Laboratory, Montgomery. Extent of paralysis: Neck, arms, legs (mild) and palate.

3V-20 Wisconsin Dana	NR	5	M	10-25-55	8-9-56	LL	L	649344
				11-25-55			L	649344
				8-3-56			L	?

Comment: Following onset of headache, fever, and slight sore throat on 8-9 was hospitalized on 8-11 with slight nuchal rigidity, slightly injected throat, and inequality in the knee jerks. The spinal fluid showed 2 cells and a normal protein. Over the next few days developed minor weakness of hamstrings on left as confirmed by orthopedic consultant. On re-examination after acute illness a very minor weakness was still present in hamstrings. A stool specimen was negative for poliovirus and a blood taken on 8-16 showed following titers: Types 1 and 2: 1 to 128; Type 3: 1 to 8.

3V-21 N.D. LaMoure DC 14 M 12-31-55 9-18-56 LL,RL PM 175049
2-11-56 PM 175049
8-18-56 PM 175073

Comment: Paresis of the legs was first noted on 9-30, and a spinal fluid revealed 141 cells, 86% lymphocytes, and a protein of 74 mgm%. Muscle evaluation on 10-30 (42 days) revealed residual involvement of both legs, with extensors of knee rated good bilaterally, flexors of the knee rated good on the right and plantar flexors of the ankle rated good bilaterally. All other muscle groups normal. The attending physician feels that all clinical and laboratory findings are compatible with paralytic poliomyelitis. It is noteworthy that six other children in family had illnesses clinically resembling nonparalytic polio. Stool specimens were taken on all family members with illness. Specimens were negative on 5 cases, and on two cases yielded a nonpolio virus, which has been forwarded to Dr. Jerome Syverton, University of Minnesota, for identification.

Table 2 (Continued)

3V Case No.	State	County	Ini- tials	Age	Sex	Dates of Inoc.	Date 1st Symp.	Site of Para.	Mfr. Lot No.
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3V-22 DROPPED.

Comment: This patient had an acute CNS illness clinically compatible with acute poliomyelitis. He was placed in a respirator following development of severe bulbospinal involvement, but died of massive pulmonary atelectasis on autopsy, cross and microscopic examination of the CNS was thought to indicate poliomyelitis, although the extent of necrosis and liquefaction was considered unusual. Histopathological review of CNS slides was reported by Dr. David Bodian, Johns Hopkins University, as showing: a) necrotizing arteritis with extensive softening of the grey matter, and b) patches of primary demyelination of the white matter. After further consideration the diagnosis has been changed to acute disseminated encephalo-myelitis.

3V-23	W.Va.	Raleigh	JEP	13	M	10-17-55	7-15-56	RL	L	649344
						11-1-55			L	649344
						5-7-56			L	658259

Comment: Onset with headache, somnolence. Seen by physician on the day of admission, and found to have fever 102, stiff neck, diminished deep tendon reflexes, positive Brudzinski sign. Spinal fluid showed 98 cells (80% lymphocytes), protein 36 mgm.%, normal chlorides and sugar. On hospitalization (7-17) found to have positive Kernig and Brudzinski signs, lympoactive DTRs in legs, weakness of both hips. Discharged on 11-9-56 at which time muscle examination revealed residual paralysis in right leg. Fitted with a short leg brace on the right.

3V-24	Nebraska	Gosper	PD	12	F	4-29-55	10-28-56	RL	?	?
						8-6-55			L	653807
						5-12-56			PM	175072

Comment: This patient had onset of weakness in right quadriceps on 10-31. Following hospitalization an LP was done, and revealed 6 cells (lymphocytes), protein 11 mgm.%. The patient was discharged from hospital on 11-19, with slight residual weakness right leg. Stool and blood specimens are being examined at the Reihart Virus Lab, Omaha.

3V-25	Nebraska	Gosper	PL	7	M	4-29-55	9-27-56	Legs and ?	?
						8-6-55		Trunk	L 653807
						5-12-56			PM 175072

Comment: This case developed weakness in legs and trunk on 9-27. CSF examination showed 11 cells (lymphocytes), protein normal. By 11-20 patient had residual weakness in both legs. Stool and blood specimens sent to Reihart Virus Lab, Omaha.

Table 3

STATE OF MINNESOTA

Polio-myelitis Cases Ages 0-19 with Onsets August 1 through October 31, 1956
(Preliminary Data)

Age Group	Paralytic Status	Number of Inoculations				Totals
		0	1	2	3	
0-4	P	8	3	1		12
	NP	5		2		7
5-9	P	6		1		7
	NP	6	7*	18*	1	32
10-14	P	5				5
	NP	8	1*	5		14
15-19	P	5	3*			8
	NP	11	1	3		15
0-19	P	24	6	2		32
	NP	30	9	28	1	68

* Each asterisk represents a case with onset within 14 days of first inoculation.

Table 4

STATE OF MINNESOTA

Evaluation of Poliomyelitis Vaccine Effectiveness,

August through October, 1956

(Preliminary Data)

Paralytic Status	Vaccination Status	Person-months* at Risk (1000's)	Cases*	Rates* (per 100,000)
Paralytic	One dose only	554.8	6	1.08
	Two or more doses	1531.6	2	0.13
	Total Vaccinated	2086.4	8	0.38
	Not Vaccinated	1305.9	24	1.84
Nonparalytic	One dose only	554.8	9	1.62
	Two or more doses	1531.6	29	1.89
	Total Vaccinated	2086.4	38	1.82
	Not Vaccinated	1305.9	30	2.30

* Cases with onsets August 1 through October 31, 1956.

Rates per 100,000 person-months at risk.

Person-months at risk for the 0-19 age group August 1 through October 31, 1956. Calculated for each month separately, and then added to the total study period. Total Vaccinated Group - The cumulative number of first inoculations for the preceding months plus half of the number of first inoculations for the current month. Two or More Doses - The cumulative number of second inoculations for the preceding months plus half of the number of second inoculations for the current month. One Dose Only - Found for each month by the subtraction of the figure for two or more doses from the total vaccinated group. Total Population - The total population of the 0-19 age group (1955 census estimate) is numerically equivalent to the total number of person-months at risk during each month. Unvaccinated Group - Found by subtracting vaccinated from total person-months at risk.

In making these calculations inoculations given from three sources were taken into account: NFIP-sponsored clinics (spring and fall of 1955), Public Agencies (October, 1955 through October 1956) and commercial (August through October, 1956). By the end of October, 1956, between 5 and 10 per cent of the two-inoculation group had received a third inoculation.

Table 5

LOS ANGELES COUNTY HOSPITAL
(January 1 - October 15, 1956)

A. Severity of Paralysis* in Cases of Poliomyelitis
in Vaccinated and Unvaccinated Individuals

Vaccination Status	Age Group	Paralytic*			Non- paralytic	Total
		Severe	Moderate	Slight		
Vaccinated	0-4	4	1	5	5	15
	5-9	3	1	29	18	51
	10-14	-	-	5	2	7
	15-19	-	-	1	2	3
	20-29	-	1	-	2	3
	30 plus	-	-	-	2	2
	Total	7	3	40	31	81
Not Vaccinated	0-4	73	26	41	29	169
	5-9	12	12	21	19	64
	10-14	10	8	15	20	53
	15-19	6	1	3	19	29
	20-29	45	16	17	32	110
	30 plus	19	7	20	30	76
	Total	165	70	117	149	501

* See Section IV of text for definition of severity

B. Frequency of Tracheotomies, Respirators and Deaths
among Vaccinated and Unvaccinated Paralytic Poliomyelitis Cases

Vaccination Status	Age Group	Total Paralytic Cases	Trach- eotomy Only	Respi- rator Only	Trach. and Resp.	Deaths
Vaccinated	0-4	10	2	-	-	-
	5-9	33	1	-	-	-
	10-14	5	-	-	-	-
	15-19	1	-	-	-	-
	20-29	1	-	-	-	-
	30 plus	-	-	-	-	-
	Totals	50	3	-	-	-
Not Vaccinated	0-4	140	1	3	7	1
	5-9	45	-	3	6	1
	10-14	33	1	1	4	-
	15-19	10	-	2	4	1
	20-29	78	1	15	17	4
	30 plus	46	2	5	13	1
	Totals	352	5	29	51	8

Table 6

Polio Myelitis Vaccine Shipment Summary

(Reports from Polio Vaccine Activity, BSS, USPHS, through 1-4-57)

Vaccine Shipments (in 1000's of cc's)

Period	NFIP**** Sponsored Clinics	Public Agencies	Commercial Channels	Export *****	Total
1955	13,541	7,893	6,233***	-	27,667
1956					
First Six Months	191	26,553	12,841	15	39,600
July	-	6,732	2,875	7	9,614
August	1	5,046	2,512	521	8,080
September	1	2,400	2,122	167	4,690
October	**	1,918	1,563	3,449	6,930
November	1	1,364	1,260	418	3,043
December	-	1,575	1,611	1,900	5,086
1956 Totals	194	45,588	24,784	6,477	77,045
Cumulative Totals	13,734	53,481	31,017	6,477	104,710
Vaccine Cleared for distribution by the National Institutes of Health but not shipped by 12-31-56					25,387

* Totals do not add because figures are rounded to nearest 1000 cc's.

** Less than 1000 cc's.

*** Includes 562,740 cc's shipped through commercial channels prior to inauguration of the Interstate Distribution Program in August, 1955.

**** Vaccine purchased by the National Foundation for Infantile Paralysis and distributed for inoculation of first and second grade children in locally organized school clinics.

***** Regulated under Department of Commerce Export policy.

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REPORT #104
JANUARY 18, 1957

VACCINATED CASES OF POLIOMYELITIS WITH INTERVALS OF 30 DAYS OR LESS
(PSU Accepted Cases January 1 - January 15, 1957)

PSU Case No.	County	Ini- tials	Age	Sex	Date Inoc.	Date 1st Sym.	Date 1st Para.	Site Inoc.	Site 1st Para.	Mfr.	Lot No.	Remarks
NEW												
Neb-28	Lancaster	RAS	10	F	5-5-54 5-12-54 6-9-54 11-3-56	11-8-56	None	IA IA IA IA	None	PD PD L L	1-506 1-506 ? 679901	Neut. titers 1:32,1:8, 1:8.
Cal-280	San Joaquin	LD	5	M	1-3-55 3-3-55 10-13-56	10-13	None	Leg Leg Leg	None	L L PD	653802 663616 029815A	
REVISIONS (Revised Items Underlined)												
Cal-271	L.A.Co.	MMH	5	F	10-13-55 12-12-55 10-20-56	10-21	None	IA IA IA	None	L L L	653803 658269 679905	<u>Spinal fluid, 36 cells.</u>
Cal-278	San Francisco	LE	20	F	10-23 11-19	<u>11-26</u>	None	IA IA	None	L L	? ?	<u>Spinal fluid, 256 cells.</u>
NY-201	Monroe	RC	6	M	<u>5-17</u>	5-29	<u>5-31</u>	<u>IA</u>	Bulbar	L	663619	