SURVEILLANCE OF POLIOMYELITIS IN THE UNITED STATES IN 1957 *

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The primary and continuing function of the National Poliomyelitis Surveillance Program is the collection, analysis and distribution of data on safety and efficacy of poliomyelitis vaccine. Established in April, 1955, at the Communicable Disease Center of the Public Health Service, the program is based upon participation by local and state health departments, the National Office of Vital Statistics, diagnostic and research laboratories, the National Foundation for Infantile Paralysis, and others with responsibility and interest in the field of poliomyelitis and polio-like diseases. Mimeographed Poliomyelitis Surveillance Reports are issued regularly, giving summaries of data reported in this program. In addition to these periodic reports, reviews of information collected in 1955 and 1956 have been published (1-4). The present report summarizes the incidence in 1957 and the epidemiologic patterns in comparison with 1955 and 1956.

During 1957 the incidence of reported poliomyelitis in the United States was the lowest recorded since 1942. A total of 5485 cases was reported to the National Office of Vital Statistics, Public Health Service, a rate of 3.2 per 100,000 population (Table 1). Of these 2331 were paralytic, 2707 were non paralytic and [illegible] By mid-August half of our population under 40 years had received at least one dose of vaccine. While the magnitude of the decline in cases cannot be ascribed to the vaccine alone, the size of the immune population must be exerting some effect on the epidemiology of the disease.

The annual poliomyelitis incidence during recent years, presented on Figure 1, shows the seasonal curve of weekly reports to the ~~National Office of Vital Statistics~~ NOVS for the years 1942, 1947 and 1952 through 1957. Great variance from year to year is seen in the magnitude of these curves and in their seasonal patterns. The only year in the same order of magnitude as 1957 is 1942. A particularly flat seasonal curve was recorded during these two years. While during 1947, the next lowest year since 1942, a relatively sharp seasonal peak occurred in mid-September. The seasonal rise in paralytic polio was gradual in 1957 and did not reach its peak incidence until the 39th week (Figure 2) contrasted with the 34th week in 1955 ~~and the 35th week in 1955~~ and the 35th week in 1956.

There were no outbreaks of epidemic proportions as have characterized the patterns of poliomyelitis in the United States in recent years. In Table 2 a listing of cases and attack rates by state for 1956 and 1957 is presented in terms of paralytic status. The decline in 1957 in all six regions is impressive. Highest rates this year were reported from the South Eastern, South Central and South Western sections where rates per 100,000 for paralytic polio were 1.9, 2.4 and 1.9 respectively. In no state were more than 3 paralytic cases per the 100,000 reported whereas, in 1956, 25 states had such rates.

In 1957, 47 percent of cases of polio were reported as paralytic, which is considerably lower than in 1955 or 1956 (53 and 55 percent). This discrepancy is felt to be an artifact due to reporting aseptic meningitis as non-paralytic polio. During the year there were many epidemics of aseptic meningitis caused by ECHO and Coxsackie viruses. The differencial diagnosis between aseptic meningitis caused by polio virus and that caused by other enteric viruses is extremely difficult without laboratory investigations. The seasonal curves of paralytic and non-paralytic polio in 1957 (Figure) reveals markedly different epidemic patterns for these two entities. Whereas non-paralytic disease reached a sharp peak in early August and then fell off rapidly, paralytic polio rose gradually to a plateau in early August reaching its peaks eight weeks later at the end of September.

AGE - SEX DISTRIBUTION

During 1957, 44 percent of the paralytic cases occurred among pre-school children (age 0-4). This represents a slight increase (2 percent) over 1956 while in 1955 this group accounted for only 32 percent of cases. (Table ~~listed as 4.~~) Although rates are declining at all ages, the fact that the fall is less pronounced in the pre-school group may in part be a reflection ~~of the fact~~ of the less complete vaccination in this group ~~is less complete~~ than among school children. The percent distribution by age for non-paralytic polio has not changed appreciably in recent years and, as can be seen on Table 4, there is no sharp concentration in the 0-4 age group.

For the past two years age-specific attack rates have been highest among one year olds with a rapid decline thereafter. In the previous years attack rates had tended to remain elevated during most of the first 10 years of life. (Ref. Dauer). In Figure 4, rates for 1952 and 1955-57 are plotted on logarithmic

paper. It will be noted from this graph that the remarkable trough of paralytic polio attack rates in 1955 among children age 7-8 has persisted in this cohort through 1956 (then 8-9 years old) and 1957 where the dip now occurs among 9-10 year olds. This group represents children who were in the first and second grades of school in the spring of 1955 and were thoroughly vaccinated in school clinics sponsored by the National Foundation of Infantile Paralysis.

During 1957, paralytic polio was 1.28 as common among males as among females (1265 to 989). On Table it can be seen that male cases were more frequent under age 20 while above that age the female cases outnumbered the males. This pattern has been noted previously (3,22) in recent years.

RACIAL DISTRIBUTION

Accurate population figures by area, race and age are not available in the United States beyond the 1950 census. Further, reporting of poliomyelitis by race is not a uniform practice. Evidence is accumulating, however, from several urban areas since 1955 which suggests an increased poliomyelitis incidence in non-white populations both absolute and relative to the rates in white populations.

In the Chicago epidemic in 1956 attack rate for paralytic polio were almost 8 times as high among negroes than among whites. During 1957 the only city with any appreciable concentration of polio was Washington, D.C. where the paralytic attack rate in non-whites was 4 times as high as in whites. While incidence has been low, studies in 16 urban areas reveals that in 7 cities (Chicago, Philadelphia, Richmond, Norfolk, New York, Baltimore and Atlanta) the paralytic rate among non-whites was markedly higher than among whites in contrast to the pattern in previous years.

Analysis of cases in southern states* reveals a similar trend. In

1955 attack rates for paralytic polio among whites were 1.8 times that among non-whites. In 1957 the attack rate among whites was only .75 that of the non-whites. In these states in 1957, 72 percent of the non-white cases occurred in pre-school children as opposed to 44 percent below the age of 5 for the entire nation (see above).

VACCINATION HISTORY

Evidence of the efficacy of the polio vaccine continued to accumulate through 1957. In Table the vaccination status by age group of cases reported to the PSU is presented for paralytic and non-paralytic cases. It would be expected that the percent of vaccinated cases should be higher among the non-paralytics than among the paralytics, since much of the non-paralytic illness is not due to the polio virus. While 54 percent of the non-paralytics had received vaccine, only 30 percent of the paralytics had. Further, a marked correlation exists between number of doses received and absence of paralysis. Whereas 56 percent of all reported non-vaccinated polio cases were paralysed only 25 percent of all triply vaccinated cases were paralysed.

An estimate of the effectiveness of the vaccine in preventing paralytic polio can be made using figures of the vaccination status of the population ~~collected in August 1957~~ by Dr. Monroe Sirken, Chief, Actuarial Analysis Section, ~~National Office of Vital Statistics~~ NOVS. Dr. Sirken estimated that by August 1957, 32 million people in the United States under age 40 had received 3 or more doses of vaccine. ~~by that time. A total of 207 triply vaccinated cases of~~ Of these, 207 for triply vaccinated paralytic polio in 1957 ~~giving an attack rate~~ of .6. During the same period ~~2055 cases of~~

*1955 -9 states & D.C. (April-October)
1956 -10 states & ~~D.C. (yr)~~
1957 -15 states & ~~D.C. (yr)~~

There were 207 cases of paralytic polio in this triply vaccinated population giving an attack rate of 0.6 per

paralytic polio occurred among people who had not been triply vaccinated, out of a population of ~~2[illegible] millions~~ giving an attack rate of ~~7.8.~~ By comparing the two attack rates we see it was times less likely to find paralytic polio in a triply vaccinated individual implying a protection by vaccine of ~~90~~ percent.

TRIPLY-VACCINATED CASES

In September, 1956, a national registry was established for reports of poliomyelitis cases occurring in individuals who had received three or more doses of polio vaccine. Clinical, epidemiological and laboratory information were submitted by state health officers.

Of triply-vaccinated cases which occurred during 1957, preliminary reports were received on 207 paralytic, 588 non-paralytic and one unspecified. Laboratory data on 85 paralytic cases and 171 non-paralytic cases are presented in Table 6. Studies were negative in the large majority of these cases; only 19 percent of the paralytic and 15 percent of the non-paralytic cases studied were confirmed as exhibiting current or recent infection with poliovirus while other viruses were isolated in 10 percent of the paralytic cases and in 20% of non-paralytic cases.

Data regarding the extent of paralytic involvement remaining after convalescence was submitted by physicians in ~~[illegible]~~ 135 cases. Residual paralysis was roughly estimated to be severe in 42 cases and moderate in 39 and mild in ~~[illegible]~~ 54 cases.

During 1957 three deaths from poliomyelitis were reported in triply-vaccinated persons. In one case, where pathologic findings were characteristic, Type III poliovirus was isolated. Pathologic findings were suggestive but laboratory studies were negative in one case. The remaining fatal case was not

confirmed; post-mortem examination was not performed and no material for virus isolation was available.

VACCINE SAFETY

The Poliomyelitis Surveillance Unit (PSU) routinely receives information on poliomyelitis cases occurring within 30 days of a polio vaccination.

Since May 1955, well over 150 million doses of vaccine have been given with no evidence of a break in safety of the product. It is felt that this fact caused reporting of under 30-day cases to be less thorough in 1957 than in previous years. A total of cases were reported to the PSU. There was no tendency for cases to become ill in the 4-11 day period following inoculation as would be expected had these been caused by the vaccine(1). Analysis of the relationship between sites of inoculation and the first paralysis show that correlation was present in only 6 cases. No specific manufacturing lot was associated with more than three paralytic cases.

VACCINE DISTRIBUTION

During the period April, 1955, through December, 1957, a cumulative total of 186.2 million doses of net bottled poliomyelitis vaccine was distributed for domestic use. This total includes 27.7 million shipped April-December, 1955, 70.5 million in 1956, and 88.2 million in 1957. In addition, 19.2 million cc's were exported during the period August, 1956, to December, 1957. During 1957, shipments lagged considerably behind releases and a balance of 33.1 million cc's was cleared by the National Institutes of Health but not shipped by the end of the year. (Distribution of vaccine by calendar quarters is presented in Figure 3.) This lag is feared to be an indication that with barely one third of our

population under 40 completely vaccinated a certain apathy toward vaccination is appearing among our public which could have dire consequences in the future.

DISCUSSION AND SUMMARY

During 1957 only 2331 cases of paralytic polio and an additional 2707 number of non-paralytic cases were reported. This, coupled with the fact that almost 90 million doses of vaccine were shipped during the year and that half of our population under 40 have received some vaccine are the most noteworthy factors about polio during the year.

The polio rates for 1957 are lower than that for any year since 1942. While the disease itself has shown great variation from year to year, part of this remarkably low incidence is undoubtedly related to the increasing size of the population protected by the vaccine.

There were no major outbreaks of polio in the nation this year. Wide spread epidemics of aseptic meningitis which did occur caused ECHO and Coxsackie viruses. In many instances these cases were diagnosed as non-paralytic polio causing an unusually high percentage of non-paralytic disease to be reported as polio (58 percent non-paralytic).

During the year 44 percent of all paralytic cases occurred among pre-school children with the peak rates among one year olds and with a sharp decline thereafter. This pattern, noted also in 1956, differs from the previous year and emphasizes the fact that the susceptible population in our country are in this pre-school group--a group not as well protected by vaccine as older children.

The trough in age specific attack rates for paralytic polio noted in 1955 among 7-8 year olds and again in 1956 in 8-9 year olds has persisted this year among the same cohort, now 9-10. Since this group is particularly well

protected, ~~by vaccination~~ having been vaccinated in the school programs in the Spring of 1955, the persistence of a high level of immunity indicates both the effectiveness and the duration of potency of vaccine.

Sex distribution of cases followed a pattern which is now fairly classic. While the majority of cases occurred in males, ~~the~~ females ~~over age 20~~ predominated. This is believed related to their greater contact with the virus through closer association with children.

As a result of the analysis of 1957 polio experience, the conviction that the vaccine is an extremely effective and safe product becomes better established. The attack rate for paralytic polio among triply-vaccinated is less than ~~one tenth~~ that of the non-vaccinated. Only 207 triply-vaccinated paralytic cases occurred while 2055 cases occurred among those not triply-vaccinated.

Almost 200 million doses of vaccine have now been shipped since May, 1955. Routine surveillance by the PSU on ~~side~~ cases occurring within 30 days of vaccination has failed to reveal evidence for a single break in vaccine safety. Over 80 million doses of vaccine were ~~shipped~~ in 1957 which is 10 million more than ~~that~~ were shipped in 1956. Most of the shipments occurred during the earlier part of the year. A marked slacking-off occurred during the latter part of the year. Only a third of our population under 40 is triply-vaccinated. It is hoped that this slacking-off does not indicate a complancency and apathy on the part of the public with so many people still remaining unvaccinated.

BIBLIOGRAPHY

1. Langmuir, A. D., Nathanson, N., and Hall, W. J.: The surveillance of poliomyelitis in the United States in 1955. Am. J. Pub. Health 46:75-88, January 1956.

2. Nathanson, N., Hall, W. J., Thrupp, L. D., Forester, H.: Surveillance of poliomyelitis in the United States in 1956. Pub. Health Rep. 72:381-392, May 1957.

3. Hall, W. J., Nathanson, N., and Langmuir, A. D.: The age distribution of poliomyelitis in the United States in 1955. Am. J. Hyg. 66:214-234, September 1957.

4. Hall, W. J., Forester, H., Thrupp, L. D., and Page, M. I.: Age distribution of poliomyelitis in the United States in 1956. Poliomyelitis Surveillance Report, Supplement No. 14, December 6, 1957.

5. Bauer, C. C.: The changing age distribution of paralytic poliomyelitis. Annals of the New York Academy of Sciences 61: 943-955, 1955.

6. Bundesen, H. N., Graning, H. M., Goldberg, E. L., and Bauer, F. C.: Preliminary report and observations on the 1956 poliomyelitis outbreak in Chicago. JAMA 163: 1604-1619, 1957.

7. Nathanson, N., et al: Epidemic poliomyelitis during 1956 in Chicago and Cook County, Illinois. To be published.

Table 1

TOTAL NATIONAL POLIOMYELITIS INCIDENCE, 1935-1957*

Year	Cases	Rates (per 100,000)	Year	Cases	Rates (per 1000,000)
1935	10,839	8.5	1947	10,734	7.5
1936	4,523	3.5	1948	27,902	19.1
1937	9,511	7.4	1949	42,173	28.4
1938	1,705	1.3	1950	33,300	22.0
1939	7,339	5.6	1951	28,386	18.6
1940	9,826	7.5	1952	57,879	36.9
1941	9,086	6.8	1953	35,592	22.5
1942	4,033	3.0	1954	38,476	23.9
1943	11,540	9.3	1955	28,985	17.6
1944	16,935	14.7	1956	15,140	9.0
1945	12,101	10.3	1957	5,485	3.2
1946	25,196	18.4			

* Sources of Data:

1935-1949 - The Notifiable Diseases, Annual Reports, Public Health Service, 1935-49.

1950-1957 - NOVS: Weekly Morbidity and Mortality Report, Vol. 6, No. 53

Population Estimates - Bureau of Census

Table 2

POLIOMYELITIS CASES REPORTED IN 1956 AND 1957 BY STATE AND PARALYTIC STATUS

State or Region	1956 Cases* Para	1956 Cases* NP	1956 Cases* Unspec	1956 Rates** Para	1956 Rates** NP	1957 Cases* Para	1957 Cases* NP	1957 Cases* Unspec	1957 Rates** Para	1957 Rates** NP
UNITED STATES	7911	6555	674	4.7	3.9	2499	2826	160	1.5	1.7
NORTH EAST	684	680	66	1.6	1.6	192	213	-	.5	.5
Maine	14	6	-	1.6	.7	4	4	-	.4	.4
New Hampshire	3	12	1	.5	2.1	1	10	-	.1	1.3
Vermont	12	10	-	3.2	2.7	4	1	-	1.1	.3
Massachusetts	48	52	-	1.0	1.1	11	14	-	.2	.3
Rhode Island	2	7	-	.2	.8	-	-	-	-	-
Connecticut	30	53	-	1.3	2.4	13	25	-	.6	1.1
New York	384	369	1	2.4	2.3	107	89	-	.7	.6
New Jersey	91	111	-	1.7	2.1	29	52	-	.5	.9
Pennsylvania	100	60	64	.9	.5	23	18	-	.2	.2
NORTH CENTRAL	2659	2827	267	5.4	5.7	713	1021	23	1.4	2.0
Ohio	313	262	3	3.4	2.9	122	101	6	1.3	1.1
Indiana	234	176	-	5.3	4.0	87	73	-	1.9	1.6
Illinois	1148	792	17	12.2	8.4	161	145	1	1.7	1.5
Michigan	308	348	-	4.1	4.6	121	377	-	1.6	4.8
Wisconsin	263	270	5	7.0	7.2	35	73	-	.9	1.9
Minnesota	78	87	-	2.4	2.7	34	32	-	1.0	1.0
Iowa	45	491	44	1.7	18.2	21	57	-	.8	2.0
Missouri	191	220	3	4.5	5.2	60	62	-	1.4	1.5
North Dakota	13	27	1	2.0	4.1	7	7	3	1.1	1.1
South Dakota	8	28	1	1.2	4.0	18	14	10	2.6	2.0
Nebraska	58	126	8	4.1	8.9	29	45	3	2.0	3.1
Kansas	-	-	185	-	-	18	35	-	.8	1.6

Table 2 (Continued)

State or Region	1956 Cases* Para	1956 Cases* NP	1956 Cases* Unspec	1956 Rates** Para	1956 Rates** NP	1957 Cases* Para	1957 Cases* NP	1957 Cases* Unspec	1957 Rates** Para	1957 Rates** NP
NORTH WEST	295	239	18	4.9	4.0	66	41	12	1.1	.7
Montana	38	17	-	6.0	2.7	5	5	2	.8	.8
Wyoming	18	17	1	5.6	5.3	7	5	-	2.2	1.6
Idaho	63	31	16	10.1	5.0	6	7	10	.9	1.1
Washington	98	93	1	3.7	3.5	19	3	-	.7	.1
Oregon	78	81	-	4.5	4.7	29	21	-	1.6	1.2
SOUTH EAST	997	849	98	3.0	2.5	621	506	71	2.1	1.7
Delaware	11	18	-	2.7	4.5	1	4	-	.2	.9
Maryland	90	23	-	3.2	.8	33	7	-	1.1	.2
Dist. of Col.	7	4	-	.8	.5	66	9	-	7.9	1.1
Virginia	151	86	-	4.1	2.4	69	38	-	1.8	1.0
West Virginia	60	48	5	3.0	2.4	39	18	-	2.0	.9
North Carolina	179	136	-	4.0	3.1	52	181	-	1.2	4.0
South Carolina	46	67	-	2.0	2.8	66	41	21	2.8	1.7
Georgia	101	85	1	2.7	2.3	71	10	12	1.9	.3
Florida	103	169	92	2.7	4.5	39	57	38	1.0	1.4
Kentucky	84	112	-	2.8	3.7	68	39	-	2.2	1.3
Tennessee	103	60	-	3.0	1.7	68	92	-	2.0	2.7
Alabama	62	41	-	2.0	1.3	49	10	-	1.6	.3
SOUTH CENTRAL	1573	1010	120	8.7	5.6	533	603	21	2.9	3.3
Mississippi	184	75	35	8.7	3.5	30	38	15	1.4	1.7
Arkansas	146	76	-	8.0	4.2	25	25	-	1.4	1.4
Louisiana	414	194	-	13.8	6.5	74	95	-	2.4	3.1
Oklahoma	93	94	33	4.1	4.2	35	80	6	1.5	3.5
Texas	736	571	52	8.2	6.4	369	365	-	4.0	4.0
SOUTH WEST	1703	950	105	9.5	5.3	374	442	33	2.0	2.4
Colorado	87	68	3	5.4	4.2	26	22	1	1.6	1.3
New Mexico	37	21	26	4.5	2.6	19	10	21	2.3	1.2
Arizona	65	61	1	6.1	5.8	22	18	-	1.9	1.6

Table 2 (Continued)

State or Region	1956 Cases* Para	1956 Cases* MP	1956 Cases* Unspec	1956 Rates** Para	1956 Rates** MP	1957 Cases* Para	1957 Cases* MP	1957 Cases* Unspec	1957 Rates** Para	1957 Rates** MP
Utah	145	24	58	17.9	3.0	12	10	11	1.4	1.2
Nevada	13	6	17	5.3	2.4	1	3	-	.4	1.1
California	1356	770	-	10.1	5.7	294	379	-	2.1	2.7
Alaska	7	2	2	3.3	1.0	3	1	-	1.5	-
Hawaii	45	17	-	7.7	2.9	9	1	-	1.5	.2
Puerto Rico	48	6	-	2.1	.3	40	4	-	1.8	.2

* Source: Morbidity and Mortality, Weekly Report, NCVS, Vol. 5, No. 53 and Vol. 6, No. 53

** Rates per 100,000 population based on population estimates by the Bureau of the Census

Table 3

PERCENTAGE DISTRIBUTION BY AGE GROUP

PARALYTIC AND NONPARALYTIC POLIOMYELITIS CASES [1]

1952*, 1955*, 1956+ and 1957x

Age Group (years)	Percent Distribution: Paralytic 1952	Paralytic 1955	Paralytic 1956	Paralytic 1957	Nonparalytic 1952	Nonparalytic 1955	Nonparalytic 1956	Nonparalytic 1957
0-4	29	32	42	44	21	19	21	17
5-9	25	21	16	18	31	29	26	28
10-14	13	12	11	9	16	17	16	16
15-19		7	7	6		8	10	11
20-29	33	16	15	13	31	16	18	18
30 +		11	9	10		9	9	10
Total Percent	100	99	100	100	99	98	100	100
Total Cases in Study	13552	9564	7399	2262	8321	8775	6269	2698

1 - Based on data reported to PSU in the Age Distribution Analysis. Cases in which paralytic status was not specified are excluded.

* - 1952 data from 22 states and D.C. and 1955 data from 33 states and D.C. previously presented in Reference (3).

+ - 1956 data from 45 states and D.C.

x - 1957 data from 47 states and D.C.

Table 4

PARALYTIC POLIOMYELITIS CASES BY SEX AND AGE GROUP

Age Group	Males	Females
0 - 4	581	424
5 - 7	233	171
10 - 14	118	80
15 - 19	79	56
20 - 24	65	78
25 - 29	74	76
30 - 34	48	49
35 - 39	24	27
40 - +	42	26
Unknown	1	1
Total	1265	989

Table 5

POLIOMYELITIS CASES BY AGE GROUP
PARALYTIC STATUS AND VACCINATION HISTORY

Age Group	Paralytic			Nonparalytic		
	Total Cases	Vaccinated One or More Doses	Percent Vaccinated	Total Cases	Vaccinated One or More Doses	Percent Vaccinated
0-4	970	246	25	434	212	49
5-9	394	198	50	742	550	74
10-14	198	93	47	417	311	75
15-19	132	37	28	293	125	43
20 +	492	84	17	733	221	30
Total	2186	658	30	2619	1419	54

Table 6

POLIOMYELITIS CASES IN TRIPLY-VACCINATED INDIVIDUALS
RESULTS OF LABORATORY STUDIES

	Paralytic		Nonparalytic	
	Cases	Percent of Total Tested	Cases	Percent of Total Tested
Polio I	6	7	11	6
Polio II			6	4
Polio II	10	12	7	4
Polio, Type Unspecified			1	1
Coxsackie	6	7	15	9
ECHO	1	1	10	6
Unidentified Virus	1	1	10	6
Negative	61	72	111	65
Total	85	100	171	101

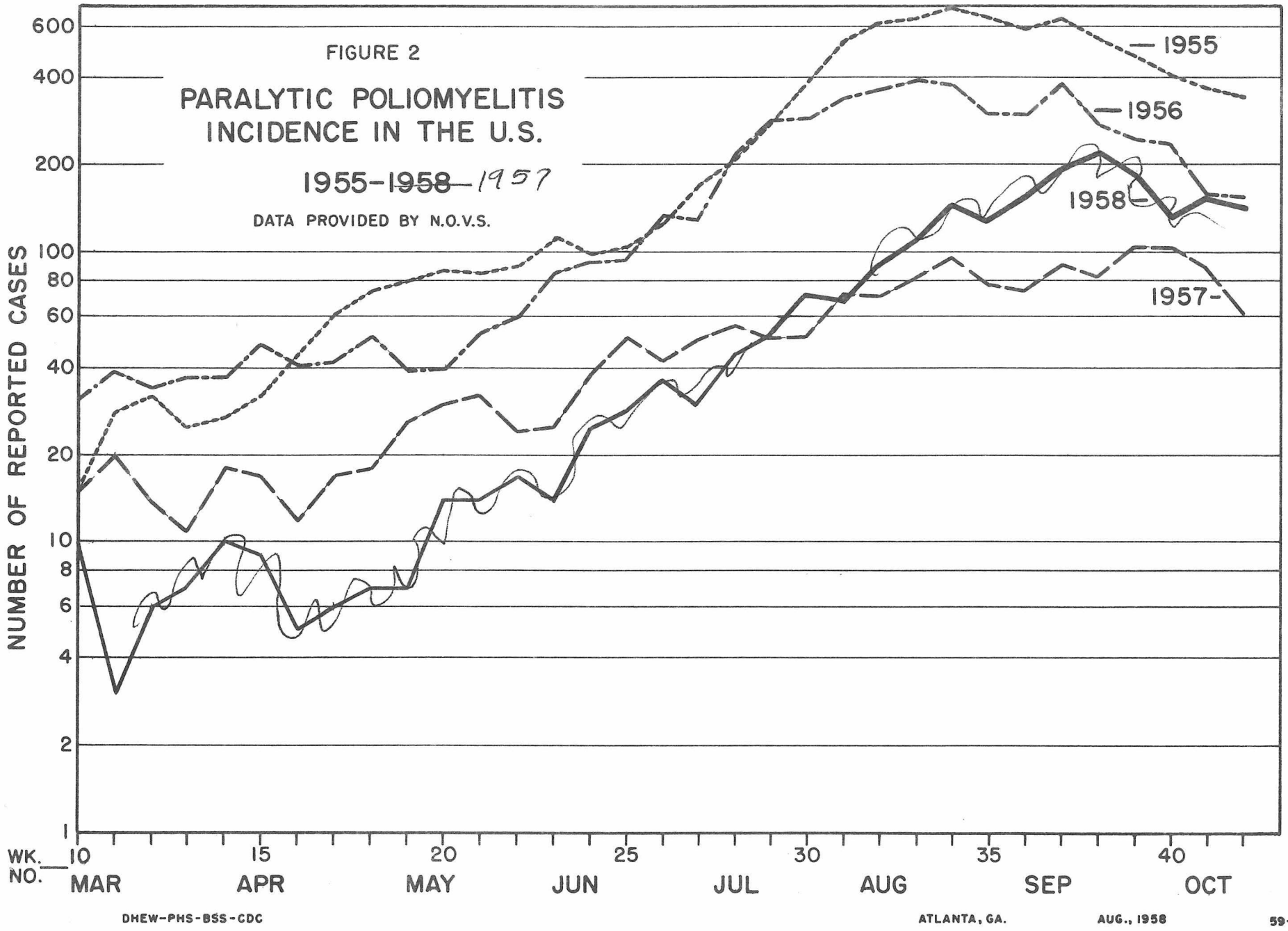


FIGURE 2
PARALYTIC POLIOMYELITIS
INCIDENCE IN THE U.S.
1955-~~1958~~-1957
DATA PROVIDED BY N.O.V.S.
NUMBER OF REPORTED CASES
600
400
200
100
80
60
40
20
10
8
6
4
2
1
1955
1956
1958
1957
WK. NO.
10
15
20
25
30
35
40
MAR
APR
MAY
JUN
JUL
AUG
SEP
OCT
DHEW-PHS-BSS-CDC
ATLANTA, GA.
AUG., 1958
59-39

FIGURE 4-3

SEASONAL INCIDENCE OF POLIOMYELITIS IN THE UNITED STATES 1957

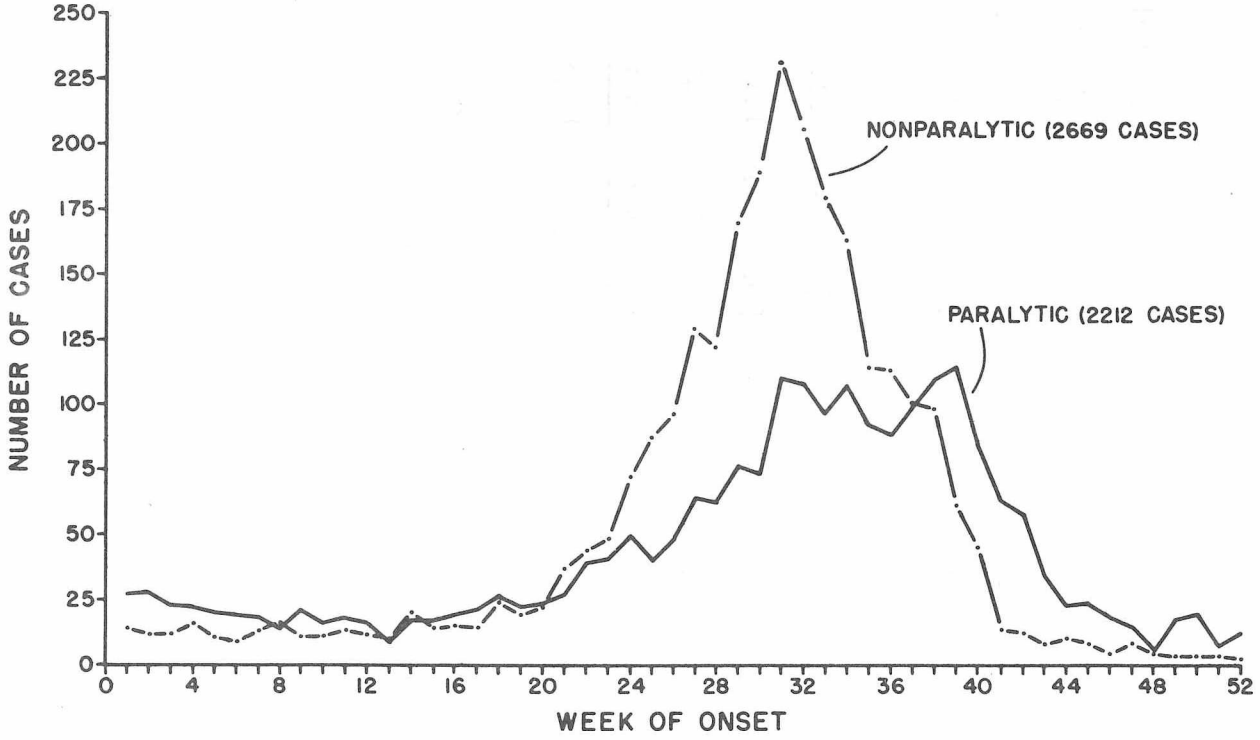


FIGURE 4

AGE-SPECIFIC ATTACK RATES OF PARALYTIC POLIOMYELITIS IN THE UNITED STATES IN 1955-1957

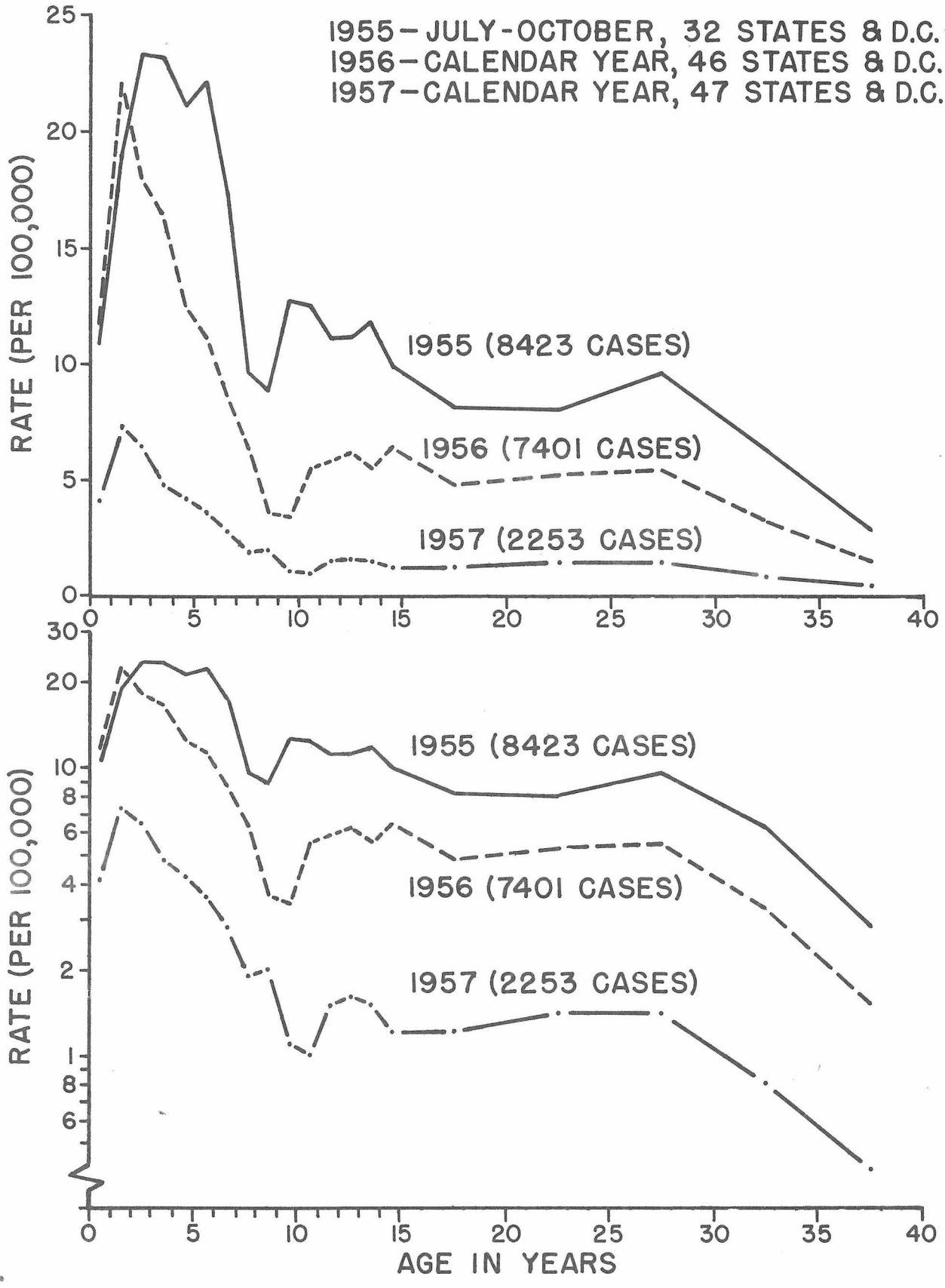
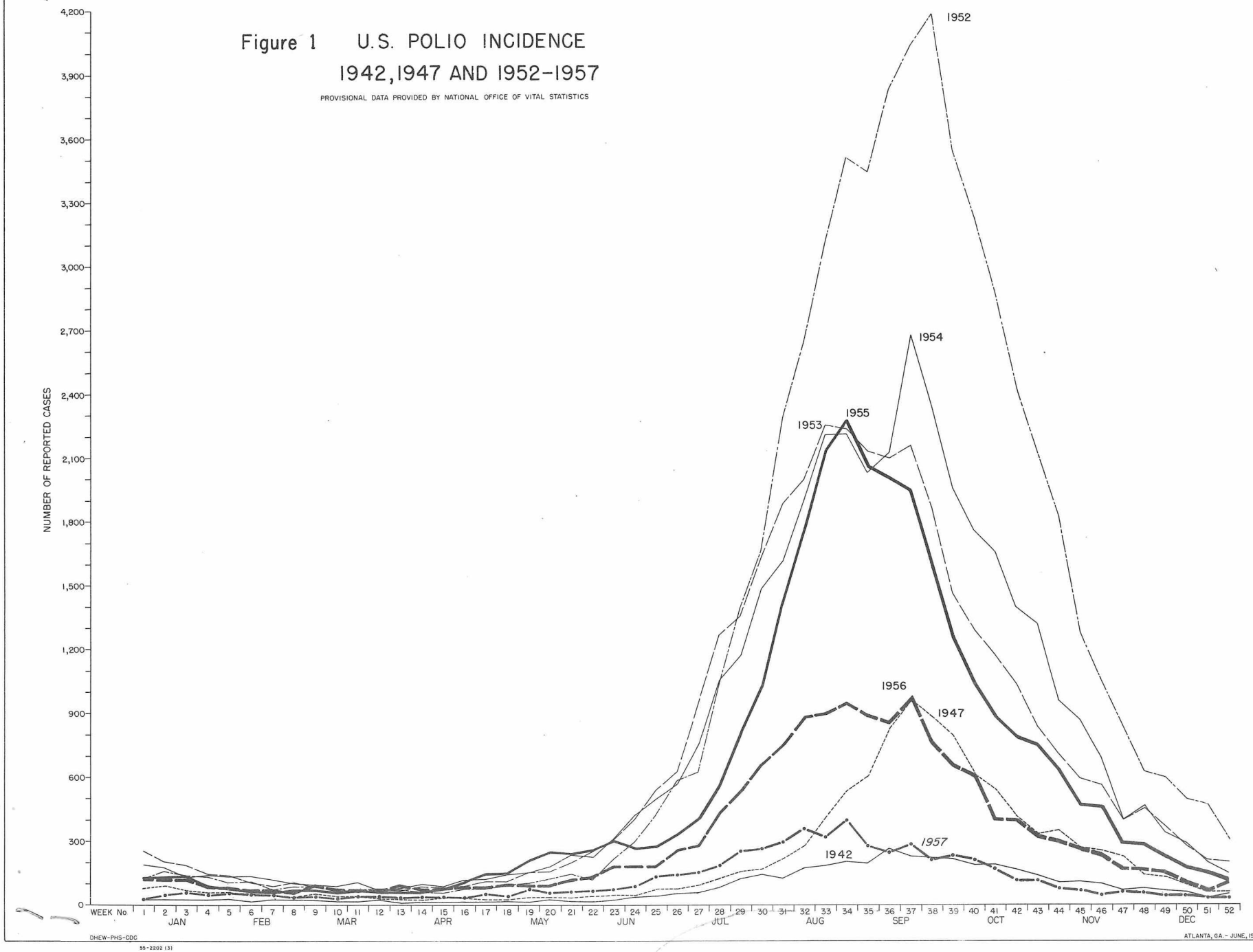


Figure 1 U.S. POLIO INCIDENCE 1942, 1947 AND 1952-1957

PROVISIONAL DATA PROVIDED BY NATIONAL OFFICE OF VITAL STATISTICS



DHEW-PHS-CDC

55-2202 (3)

ATLANTA, GA. - JUNE, 1955

Figure 5

POLIOMYELITIS VACCINE DISTRIBUTION, 1955-1957

DATA FROM POLIOMYELITIS VACCINE ACTIVITY, BSS, USPHS

DHEW-PHS-BSS-CDC ATLANTA, GA

FEB. 1958

58-259