POLIOMYELITIS SURVEILLANCE REPORT THIRD YEAR NO. 106 MARCH 1, 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
50 Seventh Street, N.E.
Atlanta, Georgia

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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I. Current Poliomyelitis Morbidity Trends

National poliomyelitis incidence declined slightly during the past week. A total of 34 cases were reported for the week ending February 23, whereas approximately 50 cases had been reported for each of the preceding six weeks. This level of incidence is lower than in any year since 1948. Figure 1 shows the 1957 weekly incidence in comparison with incidence curves for January to May for the years 1952 to 1956. Table 1 presents reported incidence for the past six weeks by states and regions, with six-week totals for the previous four years.

II. Report from South Carolina

Dr. G.E. McDaniel, Director, Division of Disease Control, South Carolina State Board of Health, has reported data of interest concerning the high incidence in South Carolina for this time of year.

The 19 cases reported January 1 through February 18 represent the highest incidence for the first seven weeks of any year for which morbidity records are available (since 1927). South Carolina's peak incidence usually occurs about mid-August. The only notable exception was in 1939, when the peak occurred in May.

Seven cases (including three whose onsets were the last week in December) have been reported from Aiken County, where the large AEC installation is located. Three cases have occurred among soldiers in a single company at Fort Jackson, Columbia, South Carolina.

Fourteen of the 19 cases are paralytic, 3 nonparalytic, and 2 unspecified. Two cases have been of severity requiring respirator care, including a 10 year old boy from Newberry County who had received three doses of polio vaccine, on April 21 and June 16, 1955, and March 1, 1956. Data regarding vaccination status of the remaining cases are not yet available.

Eight of the 19 cases are over 15 years of age, an unusually high proportion in this age group for this State and time of year.

III. California Survey

Stephen F. Gibbens, Poliomyelitis Survey Unit, State of California Department of Public Health, has submitted a summary of the survey conducted in the summer of 1956 by the California State Department of Public Health. Particularly noteworthy is Figure 2, based on data from this survey, showing percent of children vaccinated by annual income of household and source of first vaccination. This summary of the survey has already been published in California Medicine:

> "In mid-1956 the California State Department of Public Health conducted a statewide household sample survey in part for the purpose

of collecting information on the poliomyelitis vaccination history of each household member and the attitude of the mother toward poliomyelitis vaccine. In an analysis of this information, these data are related to the social and economic characteristics of each household.

The sample included some 3,500 households, containing about 11,000 persons, or about one household out of every 1,200 in the state. Although information on poliomyelitis vaccine was collected from the entire sample, the tabulations reported by the department in an unpublished manuscript are restricted to persons 0 to 14 years of age, a group to which the vaccine had been available from either private physicians or public clinics for about eight months before the survey. The sample contained 3,342 children under 15 years of age.

Preliminary analysis of the survey data taken in mid-1956 reveals that:

1. Forty-two percent of the 3,342 children under 15 years had received their first poliomyelitis vaccination; 58 per cent had not been vaccinated against poliomyelitis.

2. Poliomyelitis vaccine was favorably regarded by 81 per cent of the mothers of children under 15. For mothers of children who had been vaccinated, 97 per cent were favorable, 2 per cent neutral and 1 per cent unfavorable. For mothers of children who had not been vaccinated, 65 per cent were favorable, 11 per cent were neutral and 22 per cent were unfavorable.

3. The most frequent reason for nonvaccination given by mothers favorable toward the vaccine was that the injections were not offered their children in school, or their doctors did not tell them the vaccine was available. The second most frequent reasons was that of a simple lack of motivation; the mother just had not gotten around to it or had not thought about it.

4. Children who were vaccinated tended to come from white families in the higher income brackets, having 2 to 4 children. They also tended to have mothers with 12 or more years of education and/or fathers in white collar occupations. In families earning less than $2,000, 83 per cent of the children under 15 had not been vaccinated, as compared with 47 per cent who had not been vaccinated in families earning more than $8,000. (See Figure 2).

5. One per cent of the children from households having income of less than $2,000 a year were vaccinated by private physicians while 34 per cent of those in the $8,000 or greater bracket were vaccinated by private physicians.

6. Comparatively few children from households having more than 3 children in the 0 to 14 age group were vaccinated in physicians' offices.

The State Department of Public Health emphasizes that there is still a high percentage of nonvaccination among some of the age groups most susceptible to poliomyelitis, and concludes that persons in these age groups who will be most resistant to obtaining immunization will probably be socio-economically similar to the nonvaccinated population found in the survey."

IV. Serum Protein Study

During the past year much interest has centered on instances of poliomyelitis developing in persons previously immunized with three inoculations of vaccine. Such vaccine "failures" in well-confirmed polio cases may be the result of (a) variation in antigenic potency of the formalinized vaccine, or (b) deficient or abnormal immune response in the individual vaccinee. In particular, rare instances of complete agammaglobulinemia might potentially be included in this group of patients. Variations in immune response may also be associated with other abnormalities of the gamma (e.g. hypogammaglobulinemia) and alpha (e.g. hypersensitive states) globulin fractions of serum protein.

Dr. Gerald R. Cooper, Director of the Hematology and Biochemistry Section of CDC, has been utilizing serum protein electrophoresis in a long range investigation upon immunity and host-resistance. A few specimens from vaccinated polio patients have been analyzed as part of this program, including one which revealed a markedly abnormal pattern. This specimen was from the triply-vaccinated 15 year-old boy from Washington State who expired after an acute illness clinically consistent with severe bulbar poliomyelitis but which proved on histopathological review to be acute disseminated encephalomyelitis (see PSU Report No. 104, Table 2, 3V-22). Dr. Cooper's report is as follows:

"Electrophoresis of the serum revealed a large abnormal peak between the alpha-2 and beta peaks. It is usually called on abnormal alpha-2 globulin peak. We have seen this peak in people with hypersensitive diseases as amyloidosis, drug sickness, lupus, and early stages of glomerulonephritis.

All of the other serum protein components in this serum were lowered relative to this peak. The usual alpha-2 and beta peaks were separable and were lowered in concentration. This distinguishes this hypersensitive condition from the picture seen in the usual nephrotic syndrome, (which)... shows a relatively increased concentration of apparently normal alpha-2 and beta components.

Poliomyelitis in the human normally causes a non-specific host response in the serum proteins. A slight increase in all of the globulins is the usual electrophoretic result.

It is concluded, therefore, that the serum electrophoretic pattern was compatible with a hypersensitive, or protein dysfunction disease, and definitely contributes evidence that the patient did not die from poliomyelitis."

The Polio Surveillance Unit is assisting the Hematology and Biochemistry Laboratory in the collection of clinical and epidemiologic data and blood specimens from such cases. The facilities of the Hematology and Biochemistry Laboratory are available for performing electrophoresis on serum specimens from vaccinated and other particularly interesting polio or "polio-like" cases. Neutralizing and complement-fixing antibody data will also be obtained, if not previously done, and correlated with the protein studies.

These electrophoretic studies should constitute both a service to physicians caring for vaccinated polio patients in testing for agammaglobulinemia and an investigative approach to the role in "immunity" of variations in serum protein fractions. We would urge that serum samples, separated from clotted whole blood, from any such pertinent cases be sent (preferably air-mail, special delivery, in vials with screw caps or thoroughly-taped corks) directly to:

Dr. Gerald Cooper
CDC Laboratory
Grady Memorial Hospital
36 Butler Street
Atlanta, Georgia

In addition, we are writing directly to Health Department Officers in the States concerned, regarding individual cases for which we now have epidemiologic records.

V. Routine Poliomyelitis Surveillance

The tabular listing of individual under-30-day vaccinated case reports that was previously routinely included in PSU Reports will henceforth be omitted. Beginning with this PSU Report, No. 106, the cases reported during the preceding period will just be included in the summary table listed according to vaccine manufacturer and paralytic status. If the rate of reported paralytic under-30-day vaccinated cases associated with any given lot of vaccine should exceed one per 100,000 doses or if a total of five or more paralytic cases is reported regardless of lot size, a tabular line-listing of all such paralytic cases associated with the given lot will also be included in the PSU Report.

During the period February 1 - 27, a total of 11 new under-30-day cases was reported, eight paralytic and three nonparalytic. Of the eight paralytic cases, four followed inoculation with Lilly vaccine and one each with Pitman-Moore and Parke,Davis. For the remaining two paralytic cases the manufacturer and lot number are unknown. These 11 cases are presented in Table 2, by vaccine manufacturer and paralytic status, together with the total under-30-day vaccinated cases reported in 1956 and to date in 1957. One of the eight paralytic cases was reported in association with Lilly lot for which six paralytic cases had previously been reported. These seven paralytic cases are listed in Table 3, where it may be noted that six of the seven occurred during the summer of 1956 in the State of Illinois, a season and geographic area of particularly high polio incidence. The remaining newly-reported paralytic cases were associated with vaccine lots for which no associated cases (or less than one case per 100,000 doses of distributed vaccine) had been previously reported.

VI. Vaccine Distribution

A summary of current and cumulative shipments of vaccine (in 1,000's cc's of net bottled vaccine) appears in Table 4. Excluding export, nine million cc's were shipped during January and seven million were shipped during the period February 1 to 15. This increase in shipments, plus an increase in exports, reduced the store of cleared vaccine on hand, but there were still 16 million cc's cleared but not shipped by February 15.

(This Report was prepared by L.D. Thrupp, H. Forester, and A.D. Langmuir, with assistance from the Statistics Section, CDC.)

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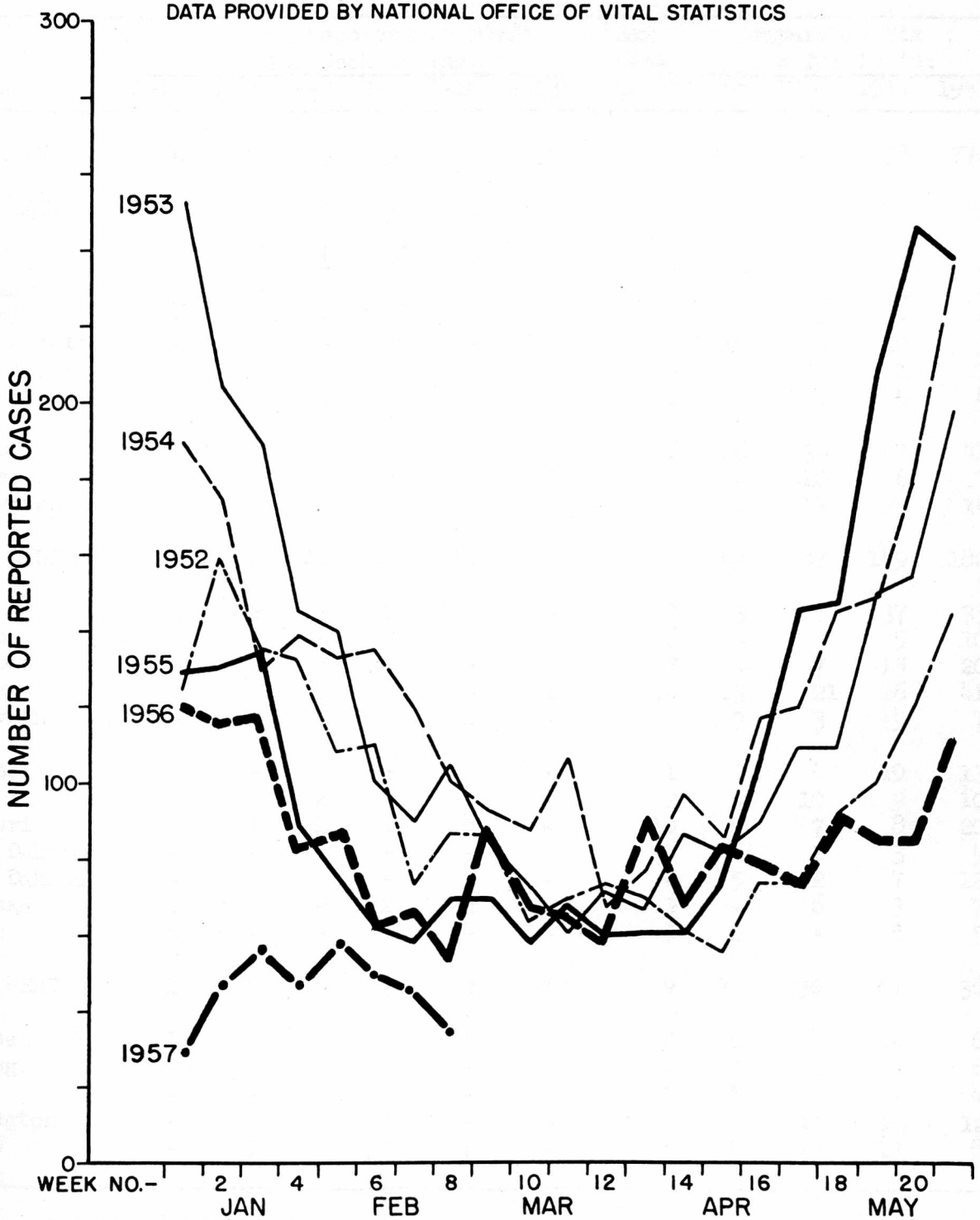
(700)

Fig. 1

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

DATA PROVIDED BY NATIONAL OFFICE OF VITAL STATISTICS



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ATLANTA, GA. - MAY, 1955

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Table 1

TREND OF 1957 POLIOMYELITIS INCIDENCE

State and Region	Cases Reported to NOVS* for Week Ending: 1-19	1-26	2-2	2-9	2-16	2-23	Six Week Total	Comparable Six Week Totals in: 1956	1955	1954	1953
UNITED STATES	56	47	53	49	45	34	284	469	489	758	770
NORTH EAST	1	2	4	-	2	1	10	56	67	97	73
Maine	-	-	1	-	-	-	1	5	1	-	1
New Hampshire	-	-	-	-	-	-	-	1	2	4	-
Vermont	-	-	-	-	-	-	-	4	1	-	-
Massachusetts	-	-	-	-	-	-	-	10	4	10	5
Rhode Island	-	-	-	-	-	-	-	-	-	1	1
Connecticut	-	-	1	-	-	-	1	-	1	5	4
New York	1	1	2	-	2	-	6	26	34	47	41
New Jersey	-	1	-	-	-	1	2	4	10	6	7
Pennsylvania	-	-	-	-	-	-	-	6	14	24	14
NORTH CENTRAL	16	8	11	11	11	6	63	49	87	149	182
Ohio	3	2	-	2	-	-	7	3	17	37	33
Indiana	2	2	-	-	-	2	6	3	5	5	10
Illinois	-	1	3	1	-	2	7	4	7	15	20
Michigan	2	1	2	5	3	1	14	13	21	26	41
Wisconsin	-	-	1	-	1	-	2	3	3	9	7
Minnesota	1	-	-	-	-	-	1	2	4	19	13
Iowa	-	-	2	-	-	-	2	4	10	9	10
Missouri	2	1	1	1	5	-	10	9	7	8	20
North Dakota	-	-	-	-	-	-	-	1	1	3	4
South Dakota	-	-	-	-	-	-	-	5	2	7	12
Nebraska	1	1	2	2	2	1	9	-	6	3	7
Kansas	5	-	-	-	-	-	5	2	4	8	5
NORTH WEST	1	2	-	3	2	1	9	34	30	61	36
Montana	1	-	-	-	1	-	2	2	4	19	6
Wyoming	-	-	-	-	-	-	-	2	1	4	6
Idaho	-	-	-	-	-	1	1	5	5	7	4
Washington	-	1	-	-	-	-	1	9	10	18	12
Oregon	-	1	-	3	1	-	5	16	10	13	8

* National Office of Vital Statistics.

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Table 1 (Continued)

State and Region	Cases Reported to NOVS* for Week Ending: 1-19	1-26	2-2	2-9	2-16	2-23	Six Week Total	Comparable Six Week Totals in: 1956	1955	1954	1953
SOUTH EAST	17	9	12	15	14	4	71	46	120	157	96
Delaware	-	-	-	-	-	-	-	1	1	-	-
Maryland	-	-	-	-	-	-	-	2	3	1	2
D. C.	-	-	-	-	-	-	-	-	-	1	-
Virginia	1	-	1	1	1	-	4	2	3	6	3
West Virginia	-	-	-	3	-	-	3	2	4	10	8
North Carolina	-	2	4	1	2	-	9	16	12	16	20
South Carolina	4	3	2	2	5	-	16	4	4	6	6
Georgia	-	-	2	5	1	1	9	-	6	19	10
Florida	9	2	3	1	4	3	22	9	61	63	28
Kentucky	1	-	-	-	-	-	1	7	14	15	12
Tennessee	2	1	-	1	1	-	5	2	7	11	4
Alabama	-	1	-	1	-	-	2	1	5	9	3
SOUTH CENTRAL	10	7	12	13	9	9	60	90	80	102	54
Mississippi	2	-	3	-	1	1	7	11	9	10	14
Arkansas	1	-	-	-	1	-	2	6	2	6	4
Louisiana	1	-	2	1	1	-	5	13	12	9	6
Oklahoma	-	1	--	-	1	1	3	3	4	10	8
Texas	6	6	7	12	5	7	43	57	53	67	22
SOUTH WEST	11	19	14	7	7	13	71	194	105	192	329
COlorado	1	-	-	3	-	-	4	2	9	7	7
New Mexico	-	1	1	-	-	-	2	1	1	2	6
Arizona	-	3	-	-	-	3	6	17	2	2	10
Utah	2	3	-	-	-	1	6	2	3	7	30
Nevada	1	-	-	-	-	-	1	3	4	1	6
California	7	12	13	4	7	9	52	169	86	173	270
TERRITORIES											
Alaska	-	1	-	-	-	-	1	1	-	17	3
Hawaii	-	-	1	-	1	-	2	23	2	32	1
Puerto Rico	3	-	1	-	-	-	4	4	170	4	6

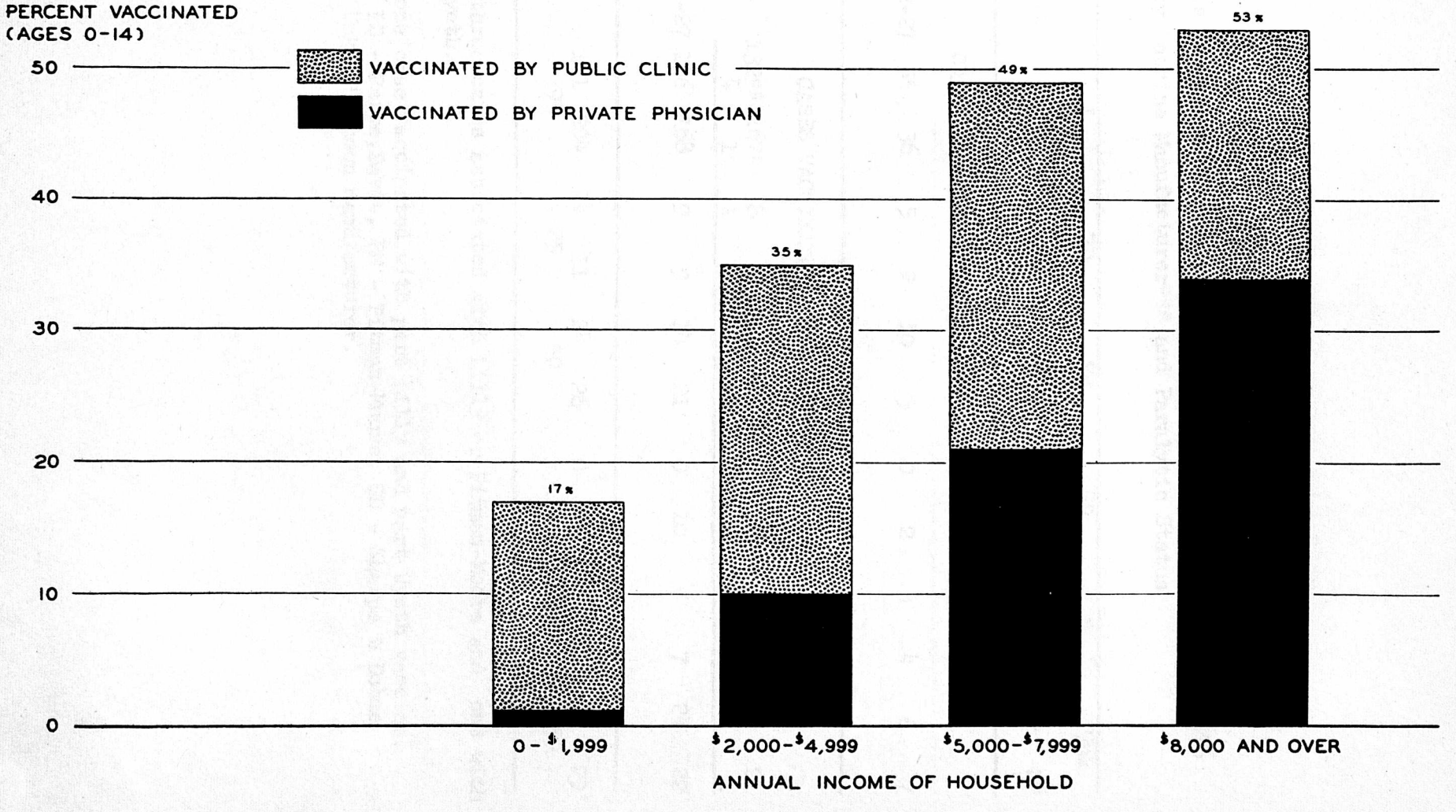
* National Office of Vital Statistics.

FIGURE 2

POLIOMYELITIS VACCINATIONS IN CALIFORNIA

PERCENT OF CHILDREN VACCINATED, AGES 0-14 BY ANNUAL INCOME OF HOUSEHOLD AND SOURCE OF FIRST VACCINATION

JUNE 1956



SOURCE: STATE OF CALIFORNIA, DEPARTMENT OF PUBLIC HEALTH, POLIOMYELITIS SURVEY RECORDS

Table 2

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		Unk	
	P	NP	P	NP	P	NP	P	NP	P	NP	P	NP
CASES VACCINATED JANUARY TO JUNE 1956												
Total through 2-27	55	36	5	2	10	5	0	2	3	4	6	7
CASES VACCINATED AFTER JUNE 1956												
Through 2-1	132**	167*	8	9	13	21	0	10	7	6	22	21
2-2 to 2-27	4	1	1	0	1	0	0	0	0	1	2	1
Total through 2-27	136	168	9	9	14	21	0	10	7	7	24	22
Grand Totals	191	204	14	11	24	26	0	12	10	11	30	29
	395		25		50		12		21		59	

* 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, Unk - Unknown manufacturer.

Table 3

Listing of Vaccine Lots and Associated Poliomyelitis Cases

Case No.	Report No.	Date last Inoculation	Date First Symptoms	Site of Inoculation	Site of 1st Paralysis
LILLY LOT NO. 676313 - A total of 500,000 cc's were distributed to 15 states and territories in July, including over 200,000 cc's to the State of Illinois.					
Ill-158	106	7-26	8-14	Leg	Legs
Md-11	98	8-29	9-13	LA	LL
Ill-139	96	8-3	8-13	RA	RA,Legs
Ill-123	93	8-6	8-13	LA	Legs
Ill-115	91	8-2	8-6	LA	Legs
Ill-117	91	8-3	8-4	RA	Bulbar
Ill-111	90	7-13	8-5	?	Bulbar

Table 4

Poliomyelitis Vaccine Shipment Summary

(Reports from Polio Vaccine Activity, BSS, USPHS, through 2-22-57)

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
1957					
January	2	4,705	4,243	2,111	11,061
February 1-15	3	4,445	2,934	231	7,613
Cumulative Totals	13,739	62,633	38,194	8,820	123,385
Vaccine Cleared for distribution by the National Institutes of Health but not shipped by 2-15-57					16,268

* 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.

Table 4

Poliomyelitis Vaccine Shipment Summary

(Reports from Polio Vaccine Activity, BSS, USPHS, through 2-22-57)

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

Period	NFIP**** Spons. and Clinics	Public Agencies	Commercial Channels	Export *****	Total
1955	13,591	7,595	6,233***	-	27,667
1956					
First Six Months	191	25,553	12,581	1,275	39,600
July	-	6,732	2,875	7	9,614
August	1	5,046	2,512	521	8,080
September	1	2,400	1,112	167	3,680
October	**	1,916	1,563	3,440	6,930
November	1	1,354	1,260	428	3,043
December	-	1,575	1,611	1,900	5,086
1956 Totals	194	45,557	24,744	6,477	77,045
1957					
January	2	4,705	4,943	2,111	11,761
February 1-15	3	4,440	2,924	230	7,613
Cumulative Totals	13,739	62,5[illegible]	3[illegible],124	6,920	123,3[illegible]5

Vaccine Cleared for distribution by the National Institutes of Health but not shipped by 2-15-57 16,265

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

** Less than 1000 cc's.

*** Includes 562,780 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.