

Age, Social, and Demographic Factors in Acceptance of Polio Vaccination

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IN ORDER to find the best means of promoting use of the Salk poliomyelitis vaccine, particularly in age grades where it is most important, the New York State Department of Health sought data on the level of vaccination by age grade within the State and on the social and psychological factors influencing the decision to accept or refuse such vaccination.

In an earlier study, the bureau of epidemiology and communicable disease control of the State department of health had obtained data on poliomyelitis vaccination among all family members of a sample of school children in every county of New York State. Since many families have no school-age children, however, this study gave only a partial picture. For a more comprehensive view with sociocultural and psychological dimensions, a new study was conducted during the spring and summer of 1957 with sampling based on total populations.

Specifically, the objectives were: (a) to provide basic data for estimates of the level of

poliomyelitis vaccination by age grades in the State population, (b) to obtain information on the comparative demographic and social characteristics of vaccinated and nonvaccinated groups, (c) to elicit data on sources of information and other factors connected with decisions to accept or refuse vaccination, and (d) to provide the department with information necessary to plan a comprehensive health education program designed to appeal to those population groups with a low level of vaccination experience.

This paper is concerned with the first two of these objectives and presents the findings on vaccination levels by age, sex, social class, and education. Forthcoming papers will deal with other aspects of the study.

The Study Design

Because of the impossibility of interviewing every family in New York State or, with time and cost limitations, to sample on a statewide basis, it was decided to choose two counties of both rural and urban populations in which to conduct intensive interviewing. The basic methodology was the home interview utilizing a number of diachronic area probability samples in each county. The two counties chosen were Rensselaer County, a semirural county with one large city, Troy, one small city, Rensselaer, and several villages with a large, rural unincorporated area; and Westchester County, an urban and suburban county which adjoins New York City. Westchester

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County differs markedly from Rensselaer County in that it is composed of numerous large cities and many suburban developments with few genuinely rural areas. Within Westchester County, it was decided to exclude the cities of Yonkers, Mount Vernon, and New Rochelle, each of which operates under a separate health department jurisdiction.

The basic plan of the research was to draw for interview an initial sample of 1,000 households in each of the two counties. A schedule of questions sought data on the poliomyelitis vaccination history of each member of the household, sociocultural characteristics of the sample population, attitudes of the respondent toward reasons for individual members of the household and certain other population groups accepting or not accepting vaccination, and the effects of various media of communication in this decision.

The Sample

Sampling in the study reported here was based on physical structures within definite geographic boundaries such as counties, cities, city blocks, or grid overlays on accurate maps. Households within these subareas were selected for the sample, the method varying somewhat between the two counties in adaptation to differences in available population and cartographic data.

This area probability technique was an alternative to the ideal method of listing all households in the counties and randomly selecting the desired interviews from among them. However, available source listings, such as directories and telephone books introduce biases because of selectivity in compilation. Also, time and cost requirements are extensive (1).

The major difficulty in setting up the sample in Rensselaer County was the unavailability of recently published census data on the geographic distribution of the population. The most recent census data by incorporated city or village and by township were 6 years old. While it would have been possible to obtain more recent data in the cities and villages, still left unanswered was the question of the population density of the unincorporated rural area of the county. Fortunately, however, estimated

population figures for this area, considered the most accurate for that county, are maintained by the Rensselaer County Health Department. On the basis of these figures, five subsamples were set up in Rensselaer County in order to allow for equal representation of the various types of areas. Subsample A would be Troy, the largest city in the county; subsample B, Rensselaer City; subsample C, the city of Hoosick Falls; subsample D, the four incorporated villages; and subsample E, the remaining unincorporated areas.

The total estimated population of the county was about 142,000 people, and interviews were allocated according to the proportion in each subsample universe of the total estimated population of the county (table 1). Each type of area required somewhat different procedures for selection of the actual households to be interviewed, but each procedure was based upon proportional representation within the county. When the interviewers actually visited every potential dwelling in the sample, it was found that the actual number of households and the estimates prepared by the staff were virtually the same, never varying more than 1 out of 30 households.

Table 1. Allocation of the sampling interviews in Rensselaer County

Area	Estimated population	Proportion of estimated total population	Number of interviews allocated
Unincorporated area	48,515	34.1	341
Troy	73,768	51.8	518
Rensselaer	11,262	7.9	79
Hoosick Falls	4,451	3.1	31
All other incorporated villages ¹	4,383	3.1	31
Total	142,379	100.0	1,000

¹ Castleton, Nassau, Schaghticoke, and Valley Falls.

The problem in Westchester County was dissimilar to that in Rensselaer County. In Westchester there were definite boundaries established on the basis of census tract lines. The population of these areas was available for the census of 1950, and the Westchester County Planning Commission had just completed an

estimation of the population of the county by census tracts for use in setting up new tract boundaries in the census of 1960. The most serious problem was the absence of any reasonably priced maps of recent vintage for the county. A commercial house in the county had maps which indicated every dwelling unit in the county and which were kept current for use by insurance companies and commercial consumer research groups. The cost of renting the maps for 1 week, however, was slightly more than the amount allocated for the entire project. We were fortunate in that the Westchester County Planning Commission was a subscriber to this map service and allowed the research team to use the maps in its offices. Using the maps, each census tract was delineated and the planning commission's estimated population indicated for each tract.

The total county population in the 150 tracts was estimated at 738,500 by the planning commission as compared with 625,816 enumerated in the census of 1950. Each census tract was assigned a series of consecutive numbers based on the population estimate for the tract in multiples of 1,000. Thus, a tract with 6,000 population was assigned six numbers, a tract with 4,000 population, four numbers, and so on. Multiples above 500 were counted as an additional thousand and an additional number assigned. Thus, if a tract had 5,637 people it was assigned six numbers.

By this method, a total of 417 numbers were assigned to the 92 census tracts in Westchester County exclusive of Mount Vernon, New Rochelle, and Yonkers. Since 1,000 interviews were required, and in order to have as much geographic dispersion as possible within the county, it was decided to select 25 census tracts and to sample 40 households within each of these 25 tracts. The tracts were selected by choosing a random number and then taking every 44th tract until 25 tracts were so selected.

Apartment developments were treated as units and every household within the apartment building was numbered separately. Interviewers were instructed to keep careful records of all households within their 40 household units and to indicate on the map any additional households found or any absent.

In no case was there a disparity of more than

Table 2. Household size and sex distribution of sample and 1950 census populations of Rensselaer and Westchester Counties

Characteristics	Rensselaer County		Westchester County	
	Sample population	1950 census ¹	Sample population	1950 census ¹
Household size -----	3.3	3.3	3.7	3.4
Sex distribution:				
Males -----	48.1	49.2	49.3	47.7
Females -----	51.9	50.8	50.7	52.3

¹ United States Bureau of the Census, 1950 Census of Population, Vol. II: Characteristics of the population, part 32, New York, table 42.

6 households per area, and the average disparity was plus or minus 2 households per 40 unit area.

Interviewing was conducted from April 1 through May 27, 1957, covering 930 households with 3,095 persons in Rensselaer County and 904 households with 3,305 persons in Westchester County.

Following the completion of the interviews there was an attempt to compare the sample population with the general population of the counties in respect to certain demographic characteristics. This was hampered by the lack of recent data on characteristics of the population in both counties. Table 2, however, compares household size and sex distributions of the sample population in each county with the same data for the entire county in the census of 1950, showing a close similarity between the sample population and the general population as described in that year. Other characteristics such as age structure, and occupational and educational structure were also compared. This comparison, while too lengthy for presentation here, once more indicated a close similarity in the demographic structures of the sample population and that of the entire county population.

Findings

The generally accepted belief that women are more health conscious, or at least receive medical care more consistently than men, seems

to be true of poliomyelitis vaccination (tables 3 and 4). At all ages from 10 through 39 years, in both counties, a higher percentage of males than females had failed to be vaccinated. This is true even at the younger ages, but as age increased the disparity between male and female rates of vaccination became greater in both counties, reaching a peak in the 20- to 29-year

age group. Two factors probably contribute to this increased difference in the 20- to 29-year age group. This age group contains the women of childbearing age who were given priority and encouraged to obtain vaccination in the poliomyelitis program. These data also seem to reflect a negative attitude to health safeguards on the part of men in this age group.

Table 3. Inoculation history by age and sex, Rensselaer County

Age groups	Total number		Number of doses							
			None				Three or more			
	Males	Females	Males		Females		Males		Females	
			Number	Per-cent	Number	Per-cent	Number	Per-cent	Number	Per-cent
Total.....	1, 488	1, 607	1, 064	71. 5	1, 091	67. 9	99	6. 7	113	7. 0
0-6 months.....	15	11	13	86. 7	10	90. 9	0	0. 0	0	0. 0
6 months-4 years.....	146	147	28	19. 2	36	24. 5	33	22. 6	42	28. 6
5-9 years.....	152	183	20	13. 2	27	14. 8	36	23. 7	40	21. 9
10-14 years.....	132	131	27	20. 5	26	19. 8	25	18. 9	13	9. 9
15-19 years.....	106	89	69	65. 1	51	57. 3	3	2. 8	6	6. 7
20-29 years.....	166	183	152	91. 6	128	69. 9	0	0. 0	8	4. 4
30-39 years.....	199	217	189	95. 0	176	81. 1	1	0. 5	4	1. 8
40-49 years.....	228	244	224	98. 2	238	97. 5	1	0. 4	0	0. 0
50-59 years.....	183	195	183	100. 0	195	100. 0	0	0. 0	0	0. 0
60 and over.....	149	196	149	100. 0	196	100. 0	0	0. 0	0	0. 0
Not stated.....	12	11	10	83. 3	8	72. 7	0	0. 0	0	0. 0

Table 4. Inoculation history by age and sex, Westchester County

Age groups	Total number		Number of doses							
			None				Three or more			
	Males	Females	Males		Females		Males		Females	
			Number	Per-cent	Number	Per-cent	Number	Per-cent	Number	Per-cent
Total.....	1, 630	1, 675	927	56. 8	902	53. 8	367	22. 6	382	22. 9
0-6 months.....	8	16	8	100. 0	15	93. 8	0	0. 0	0	0. 0
6 months-4 years.....	235	188	22	9. 4	15	8. 0	129	54. 9	107	56. 9
5-9 years.....	173	193	12	6. 9	8	4. 1	115	66. 5	135	69. 9
10-14 years.....	148	111	28	18. 9	14	12. 6	79	53. 4	63	56. 8
15-19 years.....	89	90	41	45. 5	35	38. 9	12	13. 6	20	22. 2
20-29 years.....	158	209	117	74. 1	95	45. 6	6	3. 8	26	12. 4
30-39 years.....	244	274	158	64. 7	159	57. 9	16	6. 6	23	8. 5
40-49 years.....	231	256	207	89. 6	232	90. 6	6	2. 6	5	2. 0
50-59 years.....	178	162	177	99. 4	161	99. 4	0	0. 0	0	0. 0
60 and over.....	138	143	136	98. 5	143	100. 0	0	0. 0	0	0. 0
Not stated.....	28	33	21	75. 0	25	75. 8	4	14. 3	3	9. 1

Table 5. Inoculation history of age groups by social position score, Rensselaer County

Age group and social position score	Total number	Number of doses				Age group and social position score	Total number	Number of doses			
		None		Three or more				None		Three or more	
		Number	Percent	Number	Percent			Number	Percent	Number	Percent
<i>6 months-39 years</i>						<i>15-19 years</i>					
Total	1,851	929	50.3	211	11.4	Total	195	120	61.5	9	4.6
I	112	30	26.8	21	18.7	I	10	3	30.0	1	10.0
II	106	35	33.3	24	22.9	II	11	7	63.7	0	0.0
III	486	230	47.3	70	14.4	III	41	27	65.9	3	7.3
IV	717	399	55.6	67	9.3	IV	84	52	61.9	4	4.8
V	424	232	54.7	28	6.6	V	48	30	62.5	1	2.1
Not stated	8	5	62.5	1	12.5	Not stated	1	1	100.0	0	0.0
<i>6 months-4 years</i>						<i>20-29 years</i>					
Total	293	64	21.8	75	25.6	Total	349	280	80.2	8	2.3
I	25	1	4.0	9	36.0	I	26	12	46.2	0	0.0
II	20	2	10.0	9	45.0	II	19	12	63.2	1	5.3
III	86	12	14.0	27	31.4	III	79	60	75.9	4	5.1
IV	102	29	28.4	25	24.5	IV	140	121	86.4	3	2.1
V	58	19	32.8	4	6.9	V	84	74	88.1	0	0.0
Not stated	2	1	50.0	1	50.0	Not stated	1	1	100.0	0	0.0
<i>5-14 years</i>						<i>30-39 years</i>					
Total	598	100	17.0	114	19.0	Total	416	365	88.0	5	1.2
I	29	3	10.3	11	37.9	I	22	11	50.0	0	0.0
II	33	1	3.0	12	36.4	II	23	13	59.1	2	9.1
III	154	20	13.0	34	22.1	III	126	111	88.1	2	1.6
IV	236	50	21.2	34	14.4	IV	155	147	94.8	1	0.6
V	144	25	18.5	23	15.8	V	88	82	93.2	0	0.0
Not stated	2	1	50.0	0	0.0	Not stated	2	1	50.0	0	0.0

This male-female difference seems to begin as early as 10 years of age in both counties, and, for poliomyelitis vaccination at least, tends to disappear after age 50.

The children from 6 months of age through 14 years of age in both counties generally had quite high inoculation experience. About 75 percent of the children in this age group received at least one injection. As was expected, it was found that the highest level of vaccination experience was in the age group from 5 to 9 years, of which about 85 percent in Rensselaer and almost 95 percent in Westchester County obtained at least one injection.

After age 15 years, the level of injection dropped sharply and decreased consistently through the life cycle so that after age 50 vir-

tually no one had been vaccinated. In the age groups from 15 through 40, when vaccination against poliomyelitis is still a necessary precaution and was so publicized, between 60 and 80 percent in each county had not obtained any injection.

A comparison of the two counties reveals a consistently higher rate of vaccination in Westchester County throughout all age groups. This is probably explained by the fact that Westchester was in the 1954 field trial and Rensselaer was not. In the 1956 and 1957 vaccine programs, moreover, the Rensselaer County Health Department favored a single injection rather than the complete series while Westchester County encouraged the administration of three doses. This difference is re-

flected in our data where a significantly higher proportion of individuals in Westchester County had obtained three or more injections. Equally important is the semirural character of Rensselaer with its older, less educated, and generally lower socioeconomic population than that of Westchester. In fact in all of the characteristics usually associated with higher medical standards, including degree of urbanization, and proximity to metropolitan areas, Westchester is superior to Rensselaer County.

The sample populations in both counties were also classified by social class, using the Hollingshead two-factor index of social position. Each respondent had been asked to identify the chief wage earner in the household and information was obtained on his occupa-

tion and education. This information was weighed individually and then combined to give an "index of social position score." Each member of a household was then assigned to one of five indexes of social position classes, based upon the index score of the chief wage earner of that household.

Most previous studies of poliomyelitis vaccination have found that social class position is one of the most important factors affecting the decision of individuals to be vaccinated (2-6). Such studies have indicated that the higher the socioeconomic status of the individual, the more likely he is to be vaccinated. Our data, without refinement of the samples by age groups, seemed to support this general hypothesis.

Table 6. Inoculation history of age groups by social position score, Westchester County

Age group and social position score	Total number	Number of doses				Age group and social position score	Total number	Number of doses			
		None		Three or more				None		Three or more	
		Number	Per cent	Number	Per cent			Number	Per cent	Number	Per cent
<i>6 months-39 years</i>						<i>15-19 years</i>					
Total	2, 112	704	33. 3	731	34. 6	Total	179	76	42. 5	32	17. 9
I	400	94	23. 5	157	39. 3	I	10	2	20. 0	3	30. 0
II	311	55	17. 7	136	43. 7	II	32	4	12. 5	8	25. 0
III	643	189	29. 4	239	37. 2	III	54	19	35. 2	11	20. 4
IV	517	244	47. 2	149	28. 8	IV	50	29	58. 0	9	18. 0
V	200	108	54. 0	40	20. 0	V	29	21	72. 4	1	3. 4
Not stated	41	14	34. 1	10	24. 4	Not stated	4	1	25. 0	0	0. 0
<i>6 months-4 years</i>						<i>20-29 years</i>					
Total	423	37	8. 7	236	55. 8	Total	367	212	57. 7	32	8. 7
I	113	5	4. 4	65	57. 5	I	54	22	40. 7	5	9. 3
II	58	6	10. 3	35	60. 3	II	36	10	27. 8	8	22. 2
III	129	10	7. 8	80	62. 0	III	113	53	46. 9	13	11. 5
IV	94	13	13. 8	46	48. 9	IV	113	87	77. 0	4	3. 5
V	24	3	12. 5	8	33. 3	V	46	36	78. 3	1	2. 2
Not stated	5	0	0. 0	2	40. 0	Not stated	5	4	80. 0	1	20. 0
<i>5-14 years</i>						<i>30-39 years</i>					
Total	625	62	9. 9	392	62. 7	Total	518	317	61. 2	39	7. 5
I	112	9	8. 0	74	66. 1	I	111	56	50. 5	10	9. 0
II	107	6	5. 6	71	66. 4	II	78	29	37. 2	14	17. 9
III	194	16	8. 2	125	64. 4	III	153	91	59. 5	10	6. 5
IV	136	19	14. 0	87	64. 0	IV	124	96	77. 4	3	2. 4
V	57	10	17. 5	28	49. 1	V	44	38	86. 4	2	4. 5
Not stated	19	2	10. 5	7	6. 8	Not stated	8	7	87. 5	0	0. 0

Table 7. Inoculation history of age groups by education of chief wage earner, Rensselaer County

Age group and education of chief wage earner	Total number	Number of doses				Age group and education of chief wage earner	Total number	Number of doses			
		None		Three or more				None		Three or more	
		Number	Percent	Number	Percent			Number	Percent	Number	Percent
<i>6 months-39 years</i>					<i>15-19 years</i>						
Total.....	1,851	929	50.2	211	11.4	Total.....	195	120	61.5	9	4.6
Professional.....	105	34	32.4	23	21.9	Professional.....	9	4	44.4	1	11.1
4 yrs. college....	102	31	30.4	22	21.6	4 yrs. college....	9	4	44.4	0	0.0
1-3 yrs. college..	232	94	40.5	34	14.7	1-3 yrs. college..	14	7	50.0	2	14.3
High school grad..	556	289	52.0	59	10.6	High school grad..	162	38	61.3	3	4.8
Part high school..	314	172	54.8	35	11.1	Part high school..	36	26	72.2	3	8.3
7-9 yrs. school...	440	251	57.0	32	7.3	7-9 yrs. school...	41	23	56.0	0	0.0
0-6 yrs. school...	101	57	56.4	6	5.9	0-6 yrs. school...	23	17	73.9	0	0.0
Not stated.....	1	1	100.0	0	0.0	Not stated.....	1	1	100.0	0	0.0
<i>6 months-4 years</i>					<i>20-29 years</i>						
Total.....	293	64	21.8	75	25.6	Total.....	349	280	80.2	8	2.3
Professional.....	21	3	14.3	11	52.4	Professional.....	20	14	70.0	0	0.0
4 yrs. college....	26	3	11.5	11	42.3	4 yrs. college....	20	7	35.0	1	5.0
1-3 yrs. college..	40	4	10.0	10	25.0	1-3 yrs. college..	40	30	75.0	3	7.5
High school grad..	91	18	19.8	22	24.2	High school grad..	105	81	77.1	3	2.9
Part high school..	44	10	22.7	11	25.0	Part high school..	52	43	82.7	1	1.9
7-9 yrs. school...	62	21	33.9	10	16.1	7-9 yrs. school...	100	93	93.0	0	0.0
0-6 yrs. school...	9	5	55.6	0	0.0	0-6 yrs. school...	12	12	100.0	0	0.0
<i>5-14 years</i>					<i>39-39 years</i>						
Total.....	598	100	16.7	114	19.1	Total.....	416	365	87.7	5	1.2
Professional.....	31	3	9.7	11	35.5	Professional.....	24	10	41.7	0	0.0
4 yrs. college....	28	4	14.3	8	28.6	4 yrs. college....	19	13	68.4	2	10.5
1-3 yrs. college..	83	6	7.2	19	22.9	1-3 yrs. college..	55	47	85.5	0	0.0
High school grad..	168	32	19.0	29	17.3	High school grad..	130	120	92.3	2	1.5
Part high school..	101	17	16.8	19	18.8	Part high school..	81	76	93.8	1	1.2
7-9 yrs. school...	144	28	19.4	22	15.3	7-9 yrs. school...	93	86	92.5	0	0.0
0-6 yrs. school...	43	10	23.3	6	14.0	0-6 yrs. school...	14	13	92.9	0	0.0

An examination of the demographic characteristics of the two counties suggested that more than social class position might be involved. In both counties a significant portion of the sample population was over age 40 and consequently not within the age groups given priority and most encouraged to seek vaccination. Also, social class position is partially related to age since education and occupational advancement both require time. As a result, we felt that it would be more realistic to consider only those individuals who were actively encouraged to seek vaccination. Only those age groups in the 6 months to 39 years range were considered. When the data were reex-

amined by age groups, a somewhat different picture was presented (tables 5 and 6).

In Rensselaer County, where the numbers in the upper two social classes were quite small, the inverse relationship between social class and failure to be vaccinated continued, although the pattern was not so consistent as when viewed apart from age. In Westchester, where the numbers of social classes I and II were considerably larger than in Rensselaer County, class II had a higher rate of vaccination than did class I. In class II, in every age group but the 15 to 19 year category the vaccination process had more often been carried to three or more injections than in class I.

These same age groups had been stratified by the education of the chief wage earner and each grouping compared in terms of vaccination status (tables 7 and 8). Again we found that, in general, as has usually been found in similar studies, the level of vaccination tended to increase with increase in education. In both counties, however, the 4-year college graduates had a generally higher rate of vaccination than did the "professional" individuals, with some postgraduate college education.

Our data appear to show, then, that there is no simple relationship between readiness to obtain vaccination and social class and educa-

tion, that perhaps more than just education and class position are factors in the generally observed improvement in vaccination experience as education and class position increase. One explanation may be that we are dealing with essentially the same people in social class II and education class II since education is an important component in computing social class. Perhaps in both cases we are describing the younger, community-centered college graduate and his family of the upper middle class who have been described by sociologists as "hyperactive in community affairs" and holding "three-fourths of all positions of leadership in

Table 8. Inoculation history of age groups by education of chief wage earner, Westchester County

Age group and education of chief wage earner	Total number	Number of doses				Age group and education of chief wage earner	Total number	Number of doses			
		None		Three or more				None		Three or more	
		Number	Percent	Number	Percent			Number	Percent	Number	Percent
<i>6 months-39 years</i>					<i>15-19 years</i>						
Total	2, 112	704	33. 3	731	34. 6	Total	179	76	42. 5	32	17. 9
Professional	428	89	20. 8	162	37. 9	Professional	22	3	13. 6	4	18. 2
4 yrs. college	301	62	20. 6	131	43. 5	4 yrs. college	22	3	13. 6	5	22. 7
1-3 yrs. college	253	84	33. 2	88	34. 8	1-3 yrs. college	22	12	54. 5	3	13. 6
High school grad	631	217	34. 4	230	36. 5	High school grad	43	15	34. 9	10	23. 3
Part high school	162	67	41. 4	50	30. 9	Part high school	13	7	53. 8	4	30. 8
7-9 yrs. school	227	120	52. 9	51	22. 5	7-9 yrs. school	34	22	64. 7	5	14. 7
0-6 yrs. school	87	53	60. 9	19	21. 8	0-6 yrs. school	19	13	68. 4	1	5. 3
Not stated	23	12	52. 2	0	0. 0	Not stated	4	1	25. 0	0	0. 0
<i>6 months-4 years</i>					<i>20-29 years</i>						
Total	423	37	8. 7	236	55. 8	Total	367	212	57. 8	32	8. 7
Professional	114	8	7. 0	71	62. 3	Professional	70	23	32. 9	9	12. 9
4 yrs. college	65	2	3. 1	37	56. 9	4 yrs. college	35	14	40. 0	8	22. 9
1-3 yrs. college	43	5	11. 6	22	51. 2	1-3 yrs. college	45	22	48. 9	4	8. 9
High school grad	134	14	10. 4	82	61. 2	High school grad	106	68	64. 2	6	5. 7
Part high school	30	2	6. 7	11	36. 7	Part high school	31	17	54. 8	3	9. 7
7-9 yrs. school	30	5	16. 7	10	33. 3	7-9 yrs. school	59	47	79. 7	2	3. 4
0-6 yrs. school	5	1	20. 0	3	60. 0	0-6 yrs. school	18	18	100. 0	0	0. 0
Not stated	2	0	0. 0	0	0. 0	Not stated	3	3	100. 0	0	0. 0
<i>5-14 years</i>					<i>30-39 years</i>						
Total	625	62	9. 9	392	62. 7	Total	518	317	61. 2	39	7. 5
Professional	110	7	6. 4	71	64. 5	Professional	112	48	42. 9	7	6. 2
4 yrs. college	103	4	3. 9	67	65. 0	4 yrs. college	76	39	51. 3	14	18. 4
1-3 yrs. college	79	6	7. 6	52	65. 8	1-3 yrs. college	64	39	60. 9	7	10. 9
High school grad	187	17	9. 1	124	66. 3	High school grad	161	103	64. 0	8	5. 0
Part high school	46	7	15. 2	31	67. 4	Part high school	42	34	81. 0	1	2. 4
7-9 yrs. school	67	15	22. 4	33	49. 3	7-9 yrs. school	37	31	83. 8	1	2. 7
0-6 yrs. school	25	4	16. 0	14	56. 0	0-6 yrs. school	20	17	85. 0	1	5. 0
Not stated	8	2	25. 0	0	0. 0	Not stated	6	6	100. 0	0	0. 0

Table 9. Reasons for failure to obtain inoculation, by age, Rensselaer County

Age group	Total number	Too old		Too young		Neglect		Immune		Not necessary for adults		Too expensive	
		Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Total	2,155	690	32.0	34	1.6	682	31.6	17	0.8	262	12.2	97	4.5
Under 6 months	23	0	0.0	18	78.3	4	17.4	0	0.0	0	0.0	0	0.0
6 months-4 years	64	0	0.0	16	25.0	28	43.8	0	0.0	0	0.0	10	15.6
5-9 years	47	0	0.0	0	0.0	14	29.8	1	2.1	0	0.0	14	29.8
10-14 years	53	0	0.0	0	0.0	17	32.1	3	5.7	0	0.0	10	18.9
15-19 years	120	0	0.0	0	0.0	61	50.8	3	2.5	4	3.3	10	8.3
20-29 years	280	10	3.6	0	0.0	189	67.5	1	0.4	29	10.4	13	4.6
30-39 years	365	25	6.8	0	0.0	177	48.5	5	1.4	54	14.8	26	7.1
40-49 years	462	195	42.2	0	0.0	104	22.5	1	0.2	68	14.7	11	2.4
50-59 years	378	222	58.7	0	0.0	47	12.4	1	0.3	58	15.3	3	0.8
60 and over	345	229	66.4	0	0.0	37	10.7	2	0.6	48	13.9	0	0.0
Not stated	18	9	50.0	0	0.0	4	22.2	0	0.0	1	5.6	0	0.0

Age group	Total number	Cutter incident program problems		Vaccine shortage		Don't believe in shots, afraid of needles		Didn't know they were available		Conflicts with other medication		Not stated	
		Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Total	2,155	53	2.5	39	1.8	92	4.3	142	6.6	25	1.2	22	1.0
Under 6 months	23	0	0.0	0	0.0	0	0.0	0	0.0	1	4.3	0	0.0
6 months-4 years	64	1	1.6	0	0.0	4	6.3	1	1.6	3	4.7	1	1.6
5-9 years	47	7	14.9	0	0.0	7	14.9	1	2.1	3	6.4	0	0.0
10-14 years	53	11	20.8	1	1.9	6	11.3	2	3.8	3	5.7	0	0.0
15-19 years	120	7	5.8	3	2.5	19	15.8	7	5.8	2	1.7	4	3.3
20-29 years	280	4	1.4	4	1.4	9	3.2	13	4.6	2	0.7	6	2.1
30-39 years	365	8	2.2	17	4.7	9	2.5	35	9.6	4	1.1	5	1.4
40-49 years	462	9	1.9	8	1.7	20	4.3	41	8.9	1	0.2	4	0.9
50-59 years	378	4	1.1	6	1.6	10	2.6	23	6.1	4	1.1	0	0.0
60 and over	345	0	0.0	0	0.0	8	2.3	17	4.9	2	0.6	2	0.6
Not stated	18	2	11.1	0	0.0	0	0.0	2	11.1	0	0.0	0	0.0

civic organizations" (7). There is considerable evidence among sociologists that it is the "next to the highest" or "striving" social class which becomes involved in community-centered programs rather than the highest social class (8-10).

Another possible explanation is that education beyond a certain point operates to reduce readiness to accept health improvement programs. College graduates and the "striving" upper middle class may not be marked with the cynicism which often seems a part of the value orientation of the highest educational and occupational strata. Whatever the reasons for this difference, the data do seem to suggest that it is the value orientation of a particular

educational or occupational stratum which figures in its readiness to accept vaccination, rather than social class or education alone.

We were also interested in determining why people had failed to receive vaccinations, and so we asked the respondent why each nonvaccinated member of the household had not been vaccinated. Reasons most commonly given were those reported in similar studies (11); advanced age, neglect, forgetfulness, and procrastination (tables 9 and 10). The most frequent reason was "too old" which, if combined with the similar response of "vaccination is not necessary for adults," accounted for about 45 percent of all reasons given in both counties. Here again we wanted to see if certain re-

sponses were more frequent in particular age groups. For example, were those who said they were "too old" actually in the over-age-40 group? Our data show that while "too old" as a reason for failure to obtain vaccination is most commonly given after age 40, a large proportion of the age group from 20 to 39 years of age gave this response again despite the fact that they were the target of vaccination programs.

The reasons centering around apathy or neglect were most frequently given in the 15-29 year age group. In most cases the response was meant to convey the idea that the individual had nevertheless realized he should be vac-

inated. In a separate question we asked the respondent's opinion as to why most teenagers had not been vaccinated. Here the laxity was assigned to the parents; in about 25 percent of the cases in both counties the response was that parents were too lax or disinterested. A later analysis indicated that this reason was given as often by respondents who had teenagers in the household as by those who did not.

The economic and educational differences between the two counties also are reflected in some of the reasons given for nonvaccination. "Too expensive" was given as a reason three times oftener in the less economically developed county of Rensselaer than in Westchester.

Table 10. Reasons for failure to obtain inoculation, by age, Westchester County

Age	Total number	Too old		Too young		Neglect		Not necessary for adults		Too expensive	
		Number	Per-cent	Number	Per-cent	Number	Per-cent	Number	Per-cent	Number	Per-cent
Total.....	1, 829	676	36. 5	37	2. 1	695	38. 1	167	9. 2	25	1. 3
Under 6 months.....	23	0	0. 0	23	100. 0	0	0	0	0. 0	0	0. 0
6 months-4 years.....	37	0	0. 0	14	39. 5	11	28. 9	0	0. 0	0	0. 0
5-9 years.....	20	0	0. 0	0	0. 0	8	42. 9	0	0. 0	1	4. 8
10-14 years.....	42	1	2. 3	0	0. 0	17	39. 5	0	0. 0	0	0. 0
15-19 years.....	76	1	1. 3	0	0. 0	55	72. 4	2	2. 6	3	3. 9
20-29 years.....	212	4	1. 4	0	0. 0	164	77. 6	15	7. 1	4	1. 9
30-39 years.....	317	25	6. 4	0	0. 0	197	63. 0	35	11. 3	7	2. 3
40-49 years.....	439	221	50. 5	0	0. 0	122	27. 9	46	10. 5	7	1. 4
50-59 years.....	338	214	63. 0	0	0. 0	67	20. 0	35	10. 4	0	0. 0
60 and over.....	279	195	69. 6	0	0. 0	38	13. 8	28	10. 1	2	0. 7
Not stated.....	46	15	30. 0	0	0. 0	16	32. 0	6	12. 0	1	2. 0

Age	Total number	Cutter incident program problems		Vaccine shortage		Don't believe in shots, afraid of needles		Didn't know they were available		Conflicts with other medication		Not stated	
		Number	Per-cent	Number	Per-cent	Number	Per-cent	Number	Per-cent	Number	Per-cent	Number	Per-cent
Total.....	1, 829	7	0. 4	41	2. 3	76	4. 2	37	2. 0	26	1. 4	42	2. 6
Under 6 months.....	23	0	0. 0	0	0. 0	0	0. 0	0	0. 0	0	0. 0	0	0. 0
6 months-4 years.....	37	1	2. 6	1	2. 6	0	0. 0	0	0. 0	5	13. 2	5	13. 2
5-9 years.....	20	0	0. 0	0	0. 0	4	19. 0	2	9. 5	4	19. 0	1	4. 8
10-14 years.....	42	2	4. 7	1	2. 3	14	32. 6	2	4. 7	3	7. 0	2	7. 0
15-19 years.....	76	1	1. 3	1	1. 3	7	9. 2	0	0. 0	2	2. 6	4	5. 3
20-29 years.....	212	1	0. 5	2	1. 0	7	3. 3	5	2. 4	3	1. 4	7	3. 3
30-39 years.....	317	0	0. 0	18	5. 8	18	5. 8	5	1. 6	6	1. 9	6	1. 9
40-49 years.....	439	2	0. 5	13	3. 0	14	3. 2	6	1. 4	3	0. 7	5	1. 1
50-59 years.....	338	0	0. 0	3	0. 9	6	1. 8	8	2. 4	0	0. 0	5	1. 5
60 and over.....	279	0	0. 0	0	0. 0	5	1. 8	7	2. 5	0	0. 0	4	1. 4
Not stated.....	46	0	0. 0	2	4. 0	1	2. 0	2	4. 0	0	0. 0	3	14. 0

Rensselaer County also had a much higher rate of response for "didn't know they were available" and for reasons associated with the safety of the vaccine such as the Cutter incident. Once again the generally lower educational and cultural level of this county would seem to explain these differences.

Summary and Conclusions

After assigning individuals drawn from two counties by area probability sampling techniques into various age, sex, socioeconomic, and educational strata, we have attempted to find out if there are any differences in poliomyelitis vaccination status which might be related to these characteristics.

Females, even at the younger ages, had a higher rate of vaccination than males, the greatest difference occurring in the age group from 20 to 29 years of age. Our interpretation is that, while it probably reflects the emphasis and priority placed upon the importance of pregnant women being vaccinated, it also represents a masculine resistance to health safeguards, particularly in this age range. This suggests that other health improvement programs must overcome the cultural value which results in the virile young male not seeking health safeguards to the same extent as children or females.

The common belief that poliomyelitis is essentially a children's disease is also reflected in our data, for there is a definite, observable drop in the level of vaccination after age 15 and up to age 40 despite the advertised susceptibility of this age group. Evidently the posters showing child victims and the name "infantile paralysis" have been more effective in establishing attitudes toward contracting the disease than have been the health education techniques designed to encourage vaccination of teenagers and adults to age 40. These findings indicate that it is not enough to tell people that they are in danger of contracting a specific disease. Public health efforts should consider specific motivational factors and the unlearning of established attitudes.

Westchester County, which is socially, economically, and culturally superior to the more rural county of Rensselaer, also had a higher

rate of vaccination at all age levels. This is true not only of first injections but is even more evident in the proportion of individuals who receive three or more injections. Some of this difference is undoubtedly due to the emphasis in the Westchester County program on the necessity of three injections for immunization as contrasted with the single-injection immunity approach in Rensselaer, but the socioeconomic and educational differences between the two counties are also factors.

These differences in participation by members of various social strata are also apparent within each of the two counties. As had been found in most similar studies, the higher the social class position and education, the higher the level of vaccination experience. Our data also indicate, however, that among individuals in the susceptible age range who were encouraged to seek vaccination, it is not the highest social class but rather the second highest which generally showed the highest level of vaccination. Similarly, it was the 4-year college graduate rather than the postcollege graduate group which had the highest vaccination level.

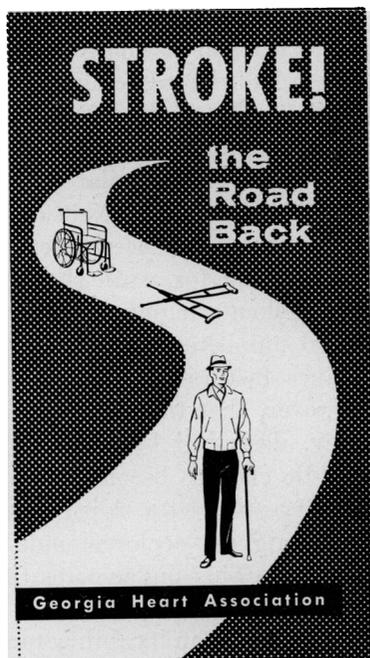
We cannot state definitely that these differences are universal for, while they appeared in both of these dissimilar counties, they may not be true elsewhere. Neither can we be certain that these differences reflect actual differences in behavior, for, while they appear consistently throughout our data, we are dealing with such small numbers in the two highest groups that chance factors may be involved. We believe, however, that they are indicative of the tendency, described by sociologists, of the upper middle class to become more involved in community-centered activities than the less "striving" highest socioeconomic and educational groups. This underscores the hypothesis that it is the value orientation of a particular stratum rather than its ability to pay or educational competence which underlies differences in readiness to participate in health improvement programs.

REFERENCES

- (1) Ianni, F. A. J.: Occupational and residential mobility as indices of the acculturation of an ethnic group. *Social Forces* 36: 65-72, October 1957.

- (2) Glasser, M. A. : A study of the public's acceptance of the Salk vaccine program. *Am. J. Pub. Health* 48: 141-146, February 1958.
- (3) Clausen, J. A., Seidenfeld, M. A., and Deasey, L. C. : Parent attitudes toward participation of their children in polio vaccine trials. *Am. J. Pub. Health* 44: 1526-1536, December 1954.
- (4) Deasey, L. C. : Socio-economic status and participation in the poliomyelitis vaccine trials. *Am. Social Rev.* 21: 185-191, April 1956.
- (5) Merrill, M. H., Hollister, A. C., Gibbens, S. F., and Haynes, A. W. : Attitudes of Californians toward poliomyelitis vaccination. *Am. J. Pub. Health* 48: 146-152, February 1958.
- (6) Weiss, R. S. : Factors affecting participation in the polio vaccine evaluation experiment. Presented at the annual meeting of the American Sociological Society, 1955. (Hectographed.)
- (7) Green, A. W. : *Sociology*. New York, McGraw-Hill, 1956 (revised), p. 187.
- (8) Hollingshead, A. B. : *Elmtown's youth*. New York, John Wiley & Sons, Inc., 1949, 480 pp.
- (9) Reissman, L. : Levels of aspiration and social class. *Am. Social Rev.* 18: 233-242 (1953).
- (10) Reissman, L. : Class, leisure, and social participation. *Am. Social Rev.* 19: 76-84 (1954).
- (11) Rosenstock, I. M., Derryberry, M., and Carriger, B. : Why people fail to seek poliomyelitis vaccination. *Pub. Health Rep.* 74: 98-103, February 1959.

Stroke Information In Georgia Leaflet



HEALTH
EDUCATION
CASE
HISTORY

"Strike Back at Stroke," the Public Health Service publication used by physicians for prescribing exercises for stroke patients, is featured in a folder published by the Georgia Heart Association in a campaign for assisting stroke victims. Several medical students, engaged by the association to interview physicians about their experience with stroke patients, reported a large proportion, if not a majority, of the physicians were familiar with the publication, "Strike Back at Stroke," and many were enthusiastic about it. They reported no information, however, on the physician's experience with the use of the publication.