Poliomyelitis Vaccination Program in Richland, Wash.

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IN RICHLAND, WASH., a community of 26,000 population, statistical evaluation of the status of poliomyelitis vaccination, followed by the education of private physicians and cooperation between these physicians and the Richland Health Department, increased the percentage of vaccinated children in the survey from about 56 percent to 80 percent. The term "vaccinated" as used in this paper refers to those children who have received at least one shot of Salk vaccine. Although we realize that one shot confers neither complete nor lasting protection, we assume that children who have received one shot will complete the series.

In the event that other communities attempt to determine their poliomyelitis vaccination status, the statistics obtained in this study may serve as a base point for comparison with their findings.

Setting the Stage

A balance in supply of and demand for the Salk vaccine was not achieved in Richland until the early spring of 1956. During 1955 the vaccine was available in adequate supply but there was no demand for it. Early in 1956, due to the change in public opinion regarding the safety and effectiveness of the vaccine, the demand was rapidly accelerated and the supply fell short. Private physicians developed waiting lists of hundreds of patients who were patiently awaiting the arrival of more vaccine.

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The situation was eased about the middle of March. Between March and October 1956 the Richland Health Department, the National Foundation for Infantile Paralysis, and private physicians recommended the Salk vaccine and gave widespread but low-pressure publicity to its safety and effectiveness. The usual methods of dissemination of information were used. Leaflets were distributed through the schools and through the Hanford Atomic Products Operation plant, the chief industry in the Richland area. Newspaper stories were released recommending vaccination and reporting the amount of vaccine available. Radio and television announcements supplemented the information program.

Between March and October 1956 vaccinations were given by private physicians in their offices. When Government-purchased vaccine became available, it, too, was distributed to private physicians for office use. During this period, no clinics were held and no vaccinations were administered by the health department.

Continuous checks showed that the demand for the vaccine exceeded the supply. However, this situation began to reverse itself during September.

Health Department Study

It was at this point that the Public Health Operation of the General Electric Company's Hanford plant (local nomenclature for the Richland Health Department), which operates all Richland municipal facilities for the Atomic Energy Commission, undertook a study to de-

termine the vaccination status of the children of the community. Children of school age and under comprise 42.2 percent of the total population of Richland.

The object of the study was to provide information on the current level of protection against poliomyelitis to help the health department decide whether a change in the vaccination program was needed. The study would also provide basic information from which to determine the effectiveness of the vaccination program and, later, the effectiveness of the vaccinations.

Study Methods

Two groups of children were studied and each group had to be treated differently. The first group was made up of school children. These children were easily reached through our regular school health program, since the public health nurses provide school health services in the community. The second group was made up of preschool children, and information on this group was more difficult to obtain.

A form which explained the advisability of vaccination against poliomyelitis and pointed out the safety and effectiveness of the Salk vaccine was prepared and was given each school child to take home. On the form parents were asked to indicate the number and approximate dates of shots of Salk vaccine received by each child and were offered the opportunity to continue the vaccination program with their private physicians. They were also requested to sign an attached slip if they were interested in administration of the vaccine by the health department.

At each school the public health nurse distributed the forms to the teachers. As is done routinely in other immunization programs, the teachers distributed the forms to the children and collected them when they were returned. The public health nurse collected the completed forms and delivered them to the health department, where the information was consolidated.

A sampling technique was used to obtain details of the vaccination histories of preschool children. In order to reduce the size of the sample, birth certificates of children born during 1952–56 were used to select the sample. To assure anonymity, only the child's address was used, and a letter was mailed to the resident at that address. The letter explained the program and the fact that in order to plan a poliomyelitis vaccination program, information was needed on the vaccination history of all children in the community. Respondents were asked to indicate on an enclosed card the ages of preschool children in the household and the approximate dates when they had received Salk vaccine shots.

The information on the sample of preschool children was combined with the information on school children.

Poliomyelitis vaccination status of children in Richland, Wash., as of October 1956

Grade	Number shots of Salk vaccine received				Total children in program
	0	1	2	3	
Preschool	1,300	150	1,700	100	3,250
Kindergarten	202	31	386	50	669
1	239	29	403	41	712
2	236	25	367	56	684
3	201	12	280	198	691
4	201	23	227	171	622
5	277	12	243	45	577
6	187	32	188	22	429
Junior high school	838	30	401	30	1,299
Senior high school	550	20	151	1	722
Total	4,231	364	4,346	714	9,655

Findings

Information was obtained on 9,655 of the 10,977 children in the preschool and school age groups. The immunization status of the children in the study is shown in the table. Figure 1 shows the percentage of children in each grade who received the designated numbers of shots of Salk vaccine.

Our chief objective was to determine which children had not been vaccinated, in order that we might take steps to achieve a higher degree of protection against poliomyelitis if the collected data indicated a need for greater protection.

The proportion of children who had not been vaccinated, that is, who had not received any shots of Salk vaccine in the poliomyelitis vac-

cination series, was 44 percent. This proportion, however, varied considerably, from a low of 29.1 percent for third grade children to a high of 76.2 percent for senior high school children. The percentage of unvaccinated children in each school grade is shown in figure 2.

Vaccination Program

When the information on the vaccination status of the school children of Richland was tallied, it was decided that, although the level of protection achieved against poliomyelitis was high, it would be desirable to increase this level considerably for two reasons: (*a*) those who by this time had not taken advantage of the opportunity to obtain this protection would not do so voluntarily or, if they did, they would do so only in small numbers; and (*b*) the level of protection in the junior and senior high schools was so inadequate that considerable emphasis needed to be placed on these groups.

A vaccination program was proposed by the health officer of Richland. The plan was discussed with and approved by the local physicians, and the program was undertaken in the schools. Vaccinations were scheduled to be given during the last 2 weeks in October and the last 2 weeks in November 1956. Three groups of children were to receive shots of Salk vaccine:

Figure 1. Percentage of children in Richland, Wash., who received the designated number of shots of Salk vaccine in 1956, by school group, prior to the vaccination program.

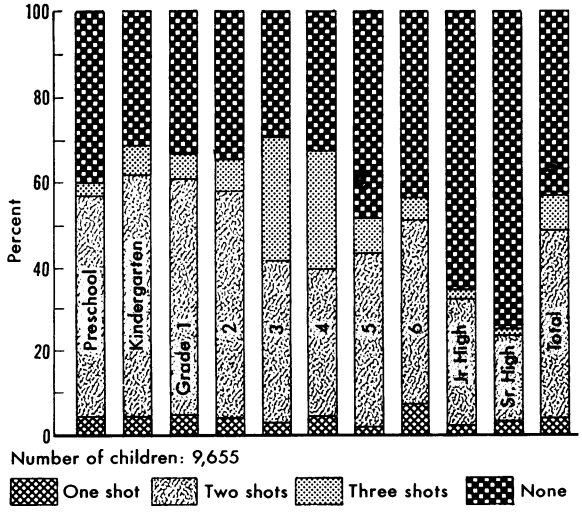
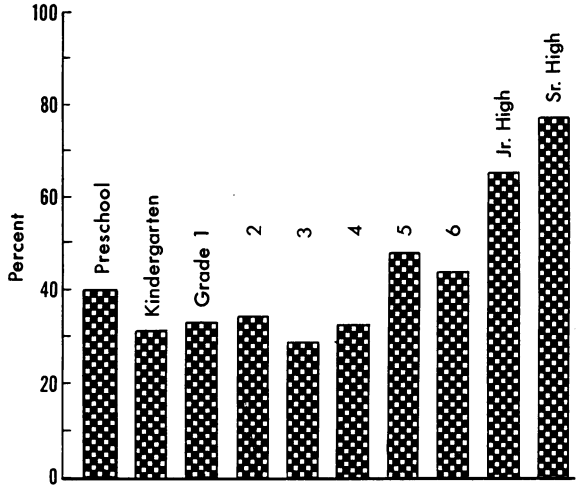


Figure 2. Percentage of children in Richland, Wash., who did not receive Salk vaccine in 1956, by school group, prior to the vaccination program.



1. Children who had received no previous shots would be given one shot in October and a second shot in November.

2. Children who had received only one shot, if it was given from 2 weeks to 6 months before either vaccination period, would be given their second shot during the October or November immunization schedule.

3. Children who had received two shots 7 months or more before October 1956 would be given their third shot during either of the vaccination periods.

In the secondary schools public health nurses discussed the safety and effectiveness of the vaccine in meetings with the students. The National Foundation for Infantile Paralysis film "Unconditional Surrender" was shown to all students, and a 15-minute television program was devoted to a discussion of the need for immunization among secondary school students.

The first half of the poliomyelitis vaccination program in the Richland schools was completed in November. Of the total population of school age and under, 80 percent have received at least one shot in the Salk vaccine series. The level of vaccinated children in the high school is 64 percent. Of the junior high school group, 80 percent have received at least one shot of vaccine; of the elementary school pupils, 87 percent.

These percentages are based on the assumption that all of those who have not responded to the questionnaire have not received any shots.

Summary

A study to determine the poliomyelitis vaccination status of all children of school age and under was carried out in 1956 in Richland, Wash., a community of 26,000 population. Through the close cooperation of private physicians and the health department, 80 percent of the children in the age groups studied received Salk vaccine.

Cost Study of Poliomyelitis Vaccine Injections

A time and cost study in the Tri-County, Colorado, District Health Department found that the average cost of administering poliomyelitis vaccine in public poliomyelitis vaccination clinics of that department in 1956 was 26.5 cents for each injection, not including vaccine cost. The study was carried out by the staff of the Region 8 office of the Public Health Service in Denver.

The Tri-County District Health Department, directed by William S. Haynes, M.D., M.P.H., has jurisdiction over the three counties surrounding Denver—Adams, Arapahoe, and Jefferson. The vaccination clinics were held principally in the department's branch health centers in each county.

There were 112 clinic sessions in which 50,585 injections were given. The total cost of the clinics in 1956 was $13,425.23, consisting of $5,856.54 direct costs, $4,037.19 nursing costs, and $3,531.50 health department general overhead costs.

Direct costs cover expenditures for specialized poliomyelitis vaccine clinic supplies and equipment, fees to physicians (on an hourly rate) for administration of the vaccine, salaries of part-time clinic nurses, and salary of a clerk working exclusively with the poliomyelitis vaccination program. The vaccine, which was furnished by the Colorado Department of Public Health, was purchased with Federal grant-in-aid funds available to Colorado under the Poliomyelitis Vaccination Assistance Act of 1955.

The nursing cost item includes the cost of nursing services furnished by the visiting nurse services of the Tri-County Department to the public clinic program. It covers a part of the health department overhead costs allocated to the nursing service and the salary value of productive work by students in the clinics.

The pro rata share of health department overhead costs covers an allocation of these costs on a dollar pro rata basis computed on direct costs against overhead costs, excluding those allocated to nursing.

The overhead costs include the salary and travel costs of the health officer, clerks, and administrative staff; capital outlay; janitor and office supplies; medical and clinical supplies; building maintenance; telephone; postage; printing; estimated rental value of space used in publicly owned buildings; per diem payments to board of health members; and attorney fees.

"Housewife" volunteers devoted about 1,000 hours of service to the program. This service, if valued at $1 per hour, would raise the cost of each injection by 2 cents.