Organizing Mass Gamma Globulin Clinics In Three North Carolina Counties

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SOME 30,000 children were inoculated with gamma globulin on a mass basis in three western North Carolina counties during the period from July 6 to August 7, 1953. Inoculations were given in Caldwell County on July 6, 7, and 8, and 12,800 children were processed in the 3 days. Catawba County was the site of a 3-day inoculation program on July 15, 16, and 17, at which time 14,761 children were given gamma globulin. In Avery County, during a 2-day program on August 6–7, 3,092 children were inoculated. The pattern developed for operating the mass gamma globulin clinics in North Carolina has proved to be highly effective.

This discussion outlines the purely administrative aspects of formulating and operating a globulin mass inoculation clinic. The criteria which must be fulfilled by a county prior to receiving globulin from the Office of Defense Mobilization varied according to the amount of globulin available, and these, accordingly, are not included.

Dr. Cameron, as chief of the communicable disease control section, division of epidemiology, in the North Carolina State Board of Health, was in immediate charge of organizing the mass globulin clinics in the three North Carolina counties where poliomyelitis in epidemic form was prevalent during July and August 1953. *For a report of how Montgomery, Ala., handled a threatened epidemic, see p. 1021.*

After receiving his medical degree at Vanderbilt University Medical School in 1948, Dr. Cameron served as district health officer with the Tennessee State Health Department, from 1949 to 1951. During the next 2 years, he was assigned as a Public Health Service commissioned officer to the Branch of Health, Bureau of Indian Affairs. Dr. Cameron has been attending the School of Public Health, University of North Carolina, where he has completed work on his master's degree in public health.

A manual based on the operations described in this report has been distributed to all local health departments in the State.

Sequence of Events

The timetable of events in each of the three North Carolina programs broadly assumed the following sequence:

The county medical society unanimously asked the local health department to forward to the State health officer a request that the county be considered for the mass use of gamma globulin. On the basis of the age distribution of the poliomyelitis cases reported up to then, the society also set the age limits of children who would receive globulin—usually all children between birth and 10 years.

The local health officer forwarded the request and an estimate of the number of children in the selected age group. The estimate was ob-

tained from census reports, birth rates, and death rates. To determine a county's eligibility, it was necessary for the health officer to supply the following additional data to the State health officer: total number of cases with age distribution; onset of cases by day; number of deaths from poliomyelitis; ratio of paralytic cases to nonparalytic cases; and number of respirator cases.

The request was reviewed by the State health officer. Upon approval, it was telephoned to the Public Health Service in Washington, D. C., acting as the allocation agent for the Office of Defense Mobilization, which advised that globulin would be granted, how much would be available, and when it would reach the county. This information was immediately transmitted to the county health officer.

The North Carolina State Board of Health, either from the central office or directly from the field, contacted the New York office of the National Foundation for Infantile Paralysis and informed it of the gamma globulin grant to the county and the estimated number of children to be inoculated so that a sufficient supply of needles and syringes could be sent. The Foundation shipped by air express directly to the county these and the other supplies it provided.

The globulin was shipped directly by air from the manufacturer to the county health officer.

The local health officer then had the responsibility for determining the number and schedule of clinics necessary to cover his county. To do so, he considered the availability of physical facilities such as schools for suitable clinic sites; the population distribution within the county; routes of transportation and communication, and the general availability of transportation; and the number of local physicians, nurses, and nurses' aides available to staff the clinics.

At this point, the following necessary efforts were carried out simultaneously. The State board of health was requested to recruit any additional physicians and nurses who might be needed to staff the clinics. The organization for local lay workers was set up, and the recruiting of the volunteers was started. The supply and equipment items to be obtained locally were listed (see minimum list), and procurement was begun. Public relations outlets such as press and radio were alerted, and arrangements were made for the regular release of pertinent information, particularly within the county.

Once clinic sites were agreed upon, it was necessary to see that tables and other fixtures were available and that water, lights, refrigeration, and telephones were in operating condition.

Two nights before the opening of the clinics, a mass meeting of all volunteer workers was held at the clinic at which they would serve. At that time, job assignments were made, and the techniques of clinic operation were outlined. The National Foundation for Infantile Paralysis assisted in the orientation of lay volunteers by showing the movie "Marbles and Lollipops."

On the day before the beginning of the clinic operation, supplies were moved to the clinics from the central supply depot. The gamma globulin, however, was kept under refrigeration until the day the clinic opened. Globulin must be stored and maintained at 40°–50° F., and appropriate storage facilities in the county had to be obtained.

As they were recruited, local professional personnel were assigned to the respective clinics. As the outside professional personnel arrived, they were assigned living quarters by the health department staff member in charge of housing professional workers. They also were assigned to work in the respective clinics as they arrived. Arrangements for transportation to the clinic sites were completed with the motor pool.

Administration and Operations

The county health department was the official agency in charge of all operations within the county. The local health officer of the respective counties was in charge of the entire mass inoculation operation within the county. He worked directly under the supervision of the local board of health and was assisted by a poliomyelitis committee of the local medical society and by the chief of the communicable disease control section of the North Carolina State Board of Health's division of epidemiology. With the aid of his staff and consult-

ants, he made the decisions as to the sites, scheduling, and operation of the clinics.

The recruitment and scheduling of local professional personnel in two counties was handled directly by the health officer or by a health department staff member; in another, they were the responsibility of a member of the poliomyelitis committee of the local medical society. Both systems worked equally well. The recruitment of additional professional workers from outside the county was handled in every instance by the State board of health; and the housing and scheduling of these workers was handled by the local health department staff. The scheduling and handling of lay workers was delegated to a lay chairman and his associates.

Because of the complexity of the organizational and operational setup of the mass inoculation program, the entire time of the local health officer and of the State consultant was required to keep the clinic program operating smoothly. When actual operations began, 1 of these 2 individuals remained on duty at the command post at all times. The other circulated from clinic to clinic, generally supervising field operations.

Keeping the distribution and flow of supplies continuous was a difficulty. Because the ratio

Minimum equipment and supplies for each gamma globulin clinic, North Carolina, 1953

Equipment

- 14 30″ x 5′ x 6′ cafeteria-size tables.
- 4 3′ x 4′ tables (cafeteria tables may be used).
- 12 adult-size chairs for use at registration, and by recorders, nurses, and syringe-process workers.
- 6 large waste cans.
- 8 4′ x 4′ x 5′ screens for use in screening registration and weighing desks from injection area (sheets suspended on wires may be used).
- 10 blankets (8 for injection tables; 2 on first aid cot or table).
- 12 basins, pots, pans, etc., for syringe wash workers.
- 2 spring-type scales.
- 6 electric fans (4 for general use in clinics; 2 for drying syringes).
- 6 18″ x 24″ x 12″ wire baskets (grocery store wire basket) for packing syringes before autoclaving.
- 6 soup bowls for alcohol sponges.
- 1 public address system.
- 1 stethoscope.
- 1 blood pressure apparatus.

Supplies

- Syringes ¾ 10 cc.; ¼ 5 cc. (at least 500 total).[1]
- 1 No. 20 or No. 22 needle per child (disposable).[1]
- 12 pts. alcohol per 1,000 children.
- 4,000 cotton balls per 1,000 children.
- 1 string tag per child.
- 1 safety pin per child.
- 1 3″ x 5″ plain index card for registering each child.
- 6 packages paper towels.
- 12 sheets for gamma globulin tables.
- 100 paper cups.
- 2 pairs scissors.
- 1 6′ x 30″ width roll paper per child.[1]
- 18 yds. elastic tape per 8 injection tables.
- 100 adhesive bandage strips.
- 1,000 rubber bands.[1]
- 1,000 gauze squares.
- 6 bars soap.
- 1 gal. liquid detergent.
- 500 envelopes or syringe wraps.[1]
- 2 staplers (if envelopes used).
- Extra staples.
- 1 syringe opener.[1]
- 12 red pencils for marking tags and gamma globulin dose.

Supplies—Continued

- 12 lead pencils.
- 100 yds. masking tape (¾″).
- 2 boxes syringe cleaner per day.[1]
- 4 globulin dose charts.
- 2 pairs forceps.
- 2 pairs pliers.

Emergency Tray

- 3 2 cc. syringes.
  3 No. 26 needles (¾″).
- 1 5 cc. syringe.
  3 No. 20 needles (1½″).
- 1 10 cc. syringe.
  1 No. 22 needle (3″).
- 6 ampules adrenalin.
- 6 ampules phenobarbital sodium.
- 1 bottle Benadryl.
- 1 4-oz. bottle aromatic spirits of ammonia.
- 1 doz. adhesive bandage strips.
- Alcohol sponges.
- Tourniquet.

Other

- Soft drinks for staff.
- Packaged crackers.
- Ice cream.
- Candy.
- Lollipops for children.

[1] Shipped air express by the National Foundation for Infantile Paralysis. Needles and syringes were packaged and autoclaved prior to use in clinics. The syringes, which were supplied on loan, were returned to the Foundation at the close of the program.

of children to the supply of syringes was high, it was necessary to clean, pack, and re-autoclave syringes while the operation was in progress. Local hospitals did all the autoclaving without charge. A supply depot was created at the local health department in each county. Supply transport corps were set up in two counties by the National Guard and in the third by volunteer workers.

In every county, communications between the clinic and the health center were maintained by telephone and by short-wave radio. The radio eliminated the overtaxing of telephone facilities at the health center. Radio sets and operators were volunteered by National Guard units and by other groups, and their location in the clinics and health centers greatly facilitated communications. This procedure is recommended for any operation of this type.

School lunchrooms were selected as the most suitable clinic sites. School authorities were most cooperative in making all facilities available. Usually, schools are located in centers of population, are easily reached by road, and parents were therefore asked to go to the clinic in the school nearest their home.

It was not considered feasible to attempt to assign the residents within certain geographic areas to any particular clinic, nor did it appear necessary to attempt to take various segments of the population on an alphabetical basis, chiefly because the amounts of globulin available were limited, and the supply was usually exhausted before the end of the scheduled operations.

Role of the State Board

In every county the program was recognized as one of local origin and as a local responsibility. The role of the State board of health in the clinics varied slightly from county to county. Briefly, the board:

Assisted the local health officer in the administration of the program.

Through the communicable disease control section of the division of epidemiology, supplied consultation to the local health officer in the organization, planning, and staging of the clinic.

Detailed a field epidemiologist to assist the health officer in the investigation, collection, and tabulation of epidemiological data relative to the poliomyelitis outbreak.

Recruited professional personnel, both physicians and nurses, from other local health departments and medical centers in the State.

Served as the official channel of communication with the Office of Defense Mobilization, the Public Health Service, and the National Foundation for Infantile Paralysis.

Through the public relations officer in the Raleigh office, assisted in the release of public information about the incidence of poliomyelitis and the gamma globulin program.

Provided plans, program, and personnel for the evaluation of the possible effect of gamma globulin on the incidence of poliomyelitis; on the administrative aspects of staging a mass inoculation clinic; and on the allocation and distribution of gamma globulin.

Clinic Organization

A basic clinic unit was set up for all North Carolina clinics. Each unit consisted of a professional group and a lay group. The organization of each lay group was planned so that it was possible to process patients for one or more groups of professional workers. In smaller operations, the clinic staff was composed of 1 professional group and 1 lay group. In the larger operations, as in Catawba County, each lay group served 2 or 3 professional groups with ease.

Professional Personnel

All inoculations were given by physicians to avoid any criticism which might have resulted from any immediate or delayed untoward reaction to the injections. The basic professional operational unit was composed of 2 physicians, 1 public health nurse in charge, 5 registered nurses, and 4 nurses' aides.

At times, the nurses performed the aides' duties and also rotated jobs with the other nurses in the clinic. Four of the registered nurses checked the dose of globulin, which had been calculated at the weighing table, and filled the syringe with the correct amount. One registered nurse was assigned as a relief nurse to

circulate in each clinic and to supervise the cleaning and packing of syringes and the distribution of other supplies.

The aides' duties consisted of carrying the filled syringe to the injection table without contamination and assisting the physician by cleansing the skin.

A local public health nurse was assigned to each clinic and designated as the professional worker in charge of the entire operation. It was her responsibility to see that each worker performed his prescribed tasks, that supplies were sufficient, and that the clinic operated at maximum efficiency at all times.

Local physicians worked only 4-hour shifts because of their immediate responsibilities in the community. Physicians recruited from outside sources worked 8-hour shifts. The majority of nurses and nurses' aides in the local community were also used on 4-hour shifts, but nurses recruited from other county health departments or elsewhere usually worked at least 8 hours a day. The public health nurse in charge was on duty throughout the hours of clinic operation, either 10 or 12 hours, with only short periods of relief.

The assistance of all professional workers—physicians, nurses, nurses' aides—who were county residents was enlisted. At no time was there a sufficient number of professional workers present in the county to meet the staffing requirements of the program.

In the recruiting of additional personnel, the North Carolina State Board of Health played a key role in the staging of the globulin clinics. Working through its division of epidemiology, the State board of health contacted numerous county health departments throughout the State in the search for volunteer public health nurses who could be spared to participate in the mass inoculation programs. The response from the local health officers in making personnel available was excellent and indicative of the good neighbor policy which exists among health departments in the State.

The division of epidemiology also took the lead in contacting the three medical schools in the State in requesting that resident physicians assist in the administration of gamma globulin.

Duke University School of Medicine, the University of North Carolina School of Medicine and Memorial Hospital at Chapel Hill, and the Bowman Gray Medical College and Baptist Hospital in Winston-Salem made physicians available to serve in the clinics. The globulin program would not have been possible without their assistance. In all North Carolina operations, professional workers volunteered their time.

Volunteer Workers

All volunteers needed to operate globulin clinics were recruited from the community in which the operation was staged. Persons under 16, pregnant women, and anyone suffering from acute or chronic communicable diseases were excluded from the volunteer ranks. All the workers served without reimbursement directly under the supervision of the chairman for each clinic.

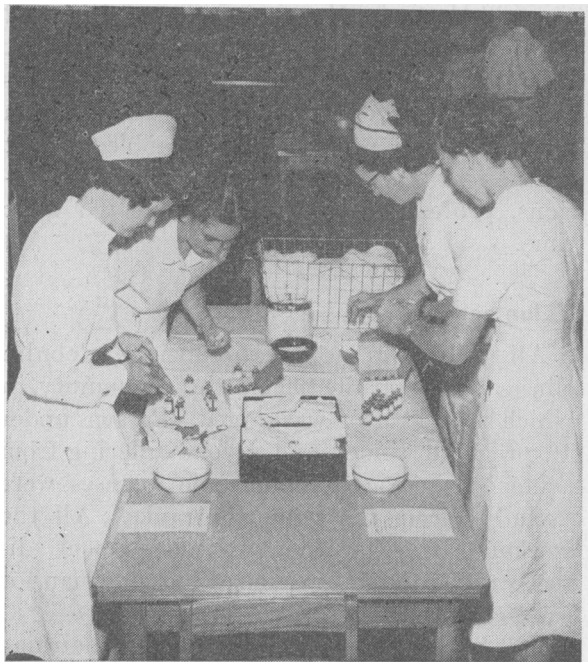
The health officer named an overall chairman in each county to head the volunteer lay workers. He, in turn, named a chairman for each of the proposed clinics. The latter was responsible for recruiting and assigning volunteer workers to the various clinic shifts.

Often, these chairmen recruited the entire membership of various community clubs and organizations to serve on a given shift in the clinics. In the instance of a clinic scheduled to operate in the same site for more than 1 day, the same group was asked to work the same shift each day in order to reduce the confusion and time lost in reorienting lay workers.

The usual shift of duty for the lay volunteers was from 5 to 6 hours a day, since this group assisted prior to the daily opening of the clinic in distributing supplies and materials and remained for clearing up after the clinic closed.

A minimum of 40 volunteers was needed for each shift in each basic clinic unit. However, the single basic lay unit was able to handle the patient load for as many as 6 or 8 physicians and the corresponding number of nurses and aides. This was accomplished by adding one guide for each injection table added to the clinic.

In addition to the chairman of each volunteer unit, the basic minimum of 40 to a shift consisted of 2 hostesses, 10 guides. 2 clerks at the registration table, 2 weighers at the weighing



Left: Local nurses prepare gamma globulin ampules before the opening of the Lenoir (Caldwell County, N. C.) clinic. Above: Volunteer workers from the Caldwell County area receive instructions from their chairman before the program starts.

table, 2 clerks at the weighing table, 2 lifters (male) to pick the children up from the injection tables, 2 workers at the first syringe wash table, 4 workers at the second syringe wash table, 4 workers for the syringe drying, wrapping, and packing detail, 2 janitors, 2 policemen or others for directing traffic, 2 workers for distributing candy and other treats to the children, 1 worker to distribute poliomyelitis leaflets, 1 telephone operator, 1 telephone messenger, and 1 radio messenger.

Transportation Corps

The transportation corps was an integral part of the lay organization. It was responsible for transporting to and from the clinics any parents and children when they did not have the means of reaching the clinic; professional personnel, particularly those recruited from outside the county who lacked transportation or who were unfamiliar with the county; and lay volunteers when they had no means of reaching the clinic.

Organization and operation of the transportation corps was successfully delegated to a local club or organization, which called on automobile dealers, taxi companies, and other groups to supply automobiles and drivers.

Motor pool headquarters were set up away from the health center to reduce traffic and telephone calls into the center, which usually served as a nerve center for the entire operation. The telephone number of the motor pool was widely circulated in the county.

The trucks, jeeps, and other vehicles needed to transport supplies and other materials to and from the clinic sites made up a separate unit of the motor pool. This supply transport unit usually functioned directly under the health department staff.

Public Information

Informing residents of the county about the details of the inoculative program schedule was not a problem in those counties with local radio stations and local daily newspapers. Avery County, however, does not have these outlets, and there the problem of informing the people was more difficult. For Avery County, then, these procedures were followed:

All telephone subscribers were called and advised of the clinic sites and schedules.

All persons on the tax rolls received a postcard giving the necessary information.

Posters and leaflets were prepared and distributed over the county.

All rural mail carriers were given the facts and were asked to spread the word along their routes.

Above: A busy registration area in a typical clinic setup. Right: A boy at the Lenoir clinic gets his shot of gamma globulin. The physician inoculates; the aide holds the child; and the male volunteer, a local fireman, stands by to lift the child from the table.

All ministers were asked to tell their congregations about the clinics.

The cooperation of two local political organizations representing the Democratic and Republican national parties was enlisted. They agreed to spread the word from house to house in the more isolated areas.

All volunteer clinic workers who attended the mass meeting 2 nights before the start of the program were asked to carry the word to their respective communities.

Newspapers from outside areas which circulate in the county and radio stations were asked to feature the news for Avery County residents.

Relations with the press proved to be an important phase of the operation. In two counties, all press contacts were made by the local health officer. In a third county, a lay worker with a newspaper background was placed in charge of the press releases. The former method was more effective inasmuch as it is sometimes difficult for a layman to interpret and translate medical concepts and ideas as effectively as a physician. In addition, it permitted the health officer to maintain the close supervision over the content of the press releases which is not possible with the latter method.

News Releases

Press and radio releases featured these ideas:

Clinics would remain in operation at all times during the scheduled hours and would continue operating until the inoculation of all specified children had been completed or until the supply of globulin had been exhausted.

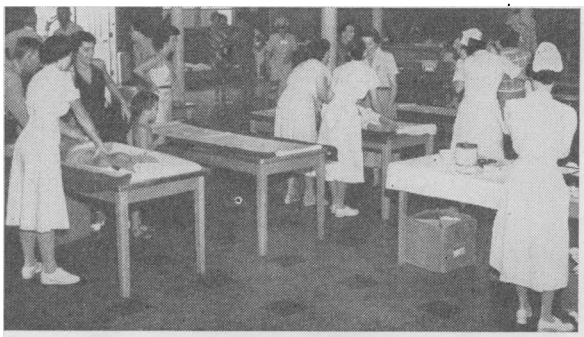
Only children who were regular residents of the county or children of transients who would remain in the county for at least 21 days would be eligible to receive the inoculations. Injections would be limited to the stipulated age groups.

Globulin would be given to noncontacts of cases only at the mass inoculation clinics. None would be available for administering in the private physician's office.

Inoculations would be given on a first-come, first-served basis. Wherever possible, parents should take children to the clinic nearest their homes.

Contacts of poliomyelitis cases should go to the family physician to receive globulin from the local health department's supply which was earmarked for administration to contacts.

Every effort would be made to avoid crowding at the clinics. Children with communicable diseases should not be brought to the clinics.



Left: A lull during the clinic procedure at the East Harper School, Caldwell County. Only 2 of the 4 injection tables are in use. Right: Peak of the rush period at the Harper School clinic. On the facing page at the left: Workers in the back of this cafeteria—school lunchrooms were used for gamma globulin administration in North Carolina—are wrapping syringes before autoclaving. The nurses in the foreground are filling syringes with immune serum globulin on the basis of weight-

One parent could accompany each child through the clinic.

Children should be dressed as simply as possible to facilitate undressing on the injection tables.

All inoculations would be given in the right hip.

As to the question of exceptional children or those with chronic illness, crippling, or other conditions, the parent should consult the family physician if there were any doubt as to the desirability of having the child inoculated.

Gamma globulin is harmless in most cases. However, some few children might experience headache, fever, chills, pain, or swelling about the inoculation site. If these reactions occurred, the parent should consult the family physician.

Clinic Procedures

The North Carolina clinics were scheduled to operate for either 10 or 12 hours a day. Caldwell and Catawba County clinics inoculated from 9 a. m. to 9 p. m., requiring 3 shifts of workers each day. Avery County clinics were open from 10 a. m. to 8 p. m., and 2 shifts a day were used.

A hostess met the parent and child at the entrance of the building. She assigned each child a number in the order of arrival at the clinic. The number was written on a small tag, which was pinned to the child's back so that it would be seen when the child lay on the injection table. If the group waiting was a large one, the parent was asked to wait either outside the building or in the auditorium. When this procedure was necessary, the children were called back to the clinic, over a public address system, in groups of 20. When the waiting line was small, the parent and child were sent immediately in to the clinic. There each child was met by a guide who escorted both child and parent through the complete clinic procedure.

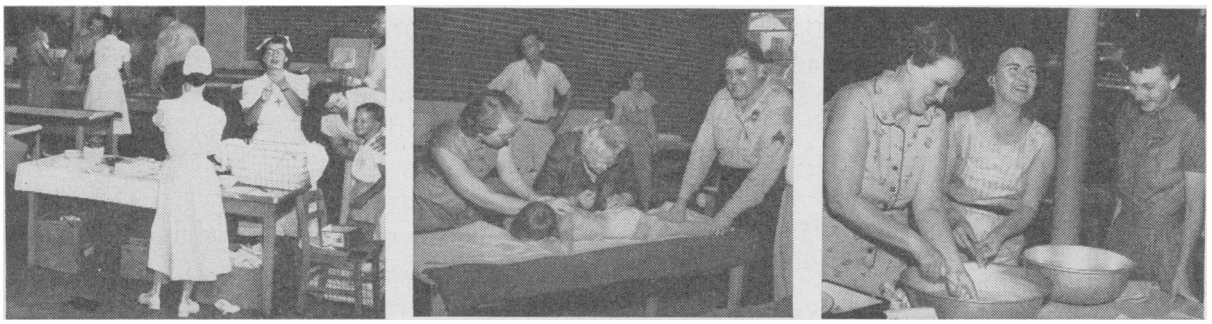
The first stop for parent, child, and guide in going through the clinic was at the registration desk where a 3- x 5-inch index registration card was filled in with the child's name, age, sex, and race and with the parent's name and address. (Documentary evidence of age or place of residence was not required.) The number on the child's tag was recorded on the card.

The second stop was at the weighing table where the child was weighed, and the globulin dose was calculated from a weight-dose chart. The amount was entered on the registration card.

The card was then left at the nurses' table. Next, the child was taken to the injection table, placed on it, and undressed as much as necessary.

The nurse checked the calculated dose using a weight-dose chart, filled a syringe with the correct amount, and handed both the syringe and registration card to an aide who took them to the injection table where the child had been placed. By assigning each physician four injection tables, almost no physician-time was lost in getting children on and off the tables.

The syringe was handed to the physician by the aide who then returned to the nurses' table. After the physician had inoculated the child,



dosage data. Center: Another view of a boy receiving a shot of gamma globulin. The police sergeant standing at the foot of the injection table was one of the volunteer male lifters at the Lenoir clinic. Right: Volunteer aides in the Lenoir clinic wash syringes before they are repacked and autoclaved for the next day's operation.

he handed the syringe to the guide who gave it to the worker at the first syringe wash table. The guide then helped the mother dress the child and escorted them to the exit where the child was given candy and ice cream and the mother received a leaflet, supplied by the National Foundation for Infantile Paralysis, which explained gamma globulin.

The guide then returned to the entrance to meet another parent and child.

At the first syringe wash table, the syringe and needle were flushed with washing solution, the needle was removed, and the two parts of the syringe were dismantled and fastened together with rubber bands. After the syringes were soaked for 20 minutes in a cleaning solution, they were taken to the second wash table, where they were cleaned with a bottle brush, rinsed, and placed on a clean sheet to dry. Drying was hastened by having electric fans blow over the area. When dry, syringes were not reassembled but were either wrapped in a special wrapper or in a paper towel, or they were dropped into a small envelope. They were then packed in wire baskets and returned to the hospital for autoclaving.

The programs in each of the three counties worked smoothly and efficiently, without congestion at the clinic sites, and with highest praise from parents whose children were brought to the clinics for gamma globulin administration.

Poliomyelitis Distribution In the United States, 1952

A record number of poliomyelitis cases were reported in the United States in 1952. The final figures show a total of 57,879 cases. This total is almost 38 percent higher than the previous high year of 1949, when a total of 42,033 cases was reported. The incidence rate in 1952 was 37.2 cases per 100,000 population, and the estimated death rate, based on a 10-percent sample of deaths registered, was 2.1. The estimated case fatality rate for the country as a whole was approximately 5 percent. Since 1916, when the rate was about 25 percent, the case fatality of the disease has declined grad-

Dr. C. C. Dauer, medical adviser of the National Office of Vital Statistics, Public Health Service, continues here the annual report series on poliomyelitis in the United States.