

# A PARTIAL SURVEY OF CHILDREN TREATED FOR INFANTILE PARALYSIS AT GILLETTE STATE HOSPITAL

By Elizabeth McGregor, Superintendent Gillette State Hospital for Crippled Children

A complete survey of all former patients treated at the Hospital was started in 1922. The first part to be completed covered patients treated for tuberculosis. This report was published from the medical aspect in Minnesota Medicine; the data concerning the educational, social and occupational conditions has not yet been used and will form a part of the final report when the survey is completed.

## Purpose

The purpose, briefly stated, is to summarize in as concise and tangible a form as possible the results of the provisions for the care, treatment and education of the crippled child, as provided for in Minnesota.

## Methods of Study

The histories of all children with, in this instance, infantile paralysis, were tabulated to show, so far as possible, the conditions, the degree of handicap, the home conditions, opportunities, and physical conditions upon return to home after hospital treatment, with as much information as it was possible to get from hospital records and from statements made by the patients.

Personal letters were written, patients were asked to visit the Hospital, and in this way a check on the present physical conditions was obtained. Letters were written to the physicians who had made out the applications, to county, school, public health and industrial nurses, county welfare workers, judges of probate, county superintendents of schools, teachers, former patients and representatives from state institutions, and many others contributed in furnishing information which helped us to locate the patients and to check the information received. Reports from the missing ones come in occasionally and in time we expect to have no one unaccounted for.

## Causes of Crippling of Children Admitted to the Gillette State Hospital from October 21, 1897 to July 1, 1925

Infantile paralysis .....	1,154
Tuberculous conditions (other than pulmonary)....	820
Congenital deformities .....	530
Rickets .....	302
Spastic paralysis .....	122
Infections .....	82
All other causes .....	209

Infantile paralysis is the cause of crippling one-third of the children admitted to the hospital. During this period, 1,154 were received into the hospital as house patients;

245 were readmissions,

52 are dead,

89 unable to locate,

56 unable to engage in any occupation outside the home and without opportunities for school,

139 over 16 years of age are attending school or are taking vocational training,

123 under 16 years of age, attending school, are not considered in the occupational study.

## Age of Admission to Hospital

Under 1 year .....	11
1 year to 5 years of age .....	77
6 years to 15 years of age .....	708
16 years and over .....	53
Number of males .....	436
Number of females .....	473

## Counties Represented

Aitkin .....	10	Houston .....	2
Anoka .....	8	Hubbard .....	12
Becker .....	10	Isanti .....	3
Beltrami .....	17	Itasca .....	17
Benton .....	6	Jackson .....	0
Bigstone .....	6	Kanabec .....	2
Blue Earth .....	16	Kandiyohi .....	4
Brown .....	4	Kittson .....	8
Carlton .....	7	Koochiching .....	12
Carver .....	5	Lac qui Parle .....	3
Cass .....	8	Lake .....	6
Chippewa .....	3	Lake of the Woods .....	0
Chisago .....	3	Le Sueur .....	2
Clay .....	11	Lincoln .....	2
Clearwater .....	3	Lyon .....	5
Cook .....	0	McLeod .....	3
Cottonwood .....	3	Mahnomen .....	12
Crow Wing .....	15	Marshall .....	16
Dakota .....	11	Martin .....	4
Dodge .....	4	Meeker .....	2
Douglas .....	5	Mille Lacs .....	6
Faribault .....	8	Morrison .....	9
Fillmore .....	3	Mower .....	8
Freeborn .....	4	Murray .....	4
Goodhue .....	0	Nicollet .....	4
Grant .....	4	Nobles .....	3
Hennepin .....	87	Norman .....	9

Olmsted .....	5	Saerburne .....	8
Otter Tail .....	17	Sibley .....	4
Pennington .....	4	Stearns .....	21
Pine .....	7	Steele .....	15
Pipestone .....	3	Stevens .....	7
Polk .....	21	Swift .....	4
Pope .....	5	Todd .....	8
Ramsey .....	110	Traverse .....	3
Red Lake .....	3	Wabasha .....	5
Redwood .....	10	Wadena .....	12
Renville .....	12	Wasceca .....	4
Rice .....	10	Washington .....	6
Rock .....	2	Watsonwan .....	2
Roseau .....	5	Wilkin .....	5
St. Louis .....	127	Winona .....	14
Scott .....	7	Yellow Medicine .....	10

#### Homes Represented

Ratings of homes represented must, of necessity, be general. An effort on the part of the parents to co-operate in carrying out treatment and providing the kind of food and clothing recommended, and who make an honest effort to give the patient at least the same opportunities they would give a healthy child, would entitle them to be classed as among those furnishing a good home. Of this classification we have.....187 or 24%.

The ordinary home is either too poor or indifferent to co-operate, and includes that large number who want to try everything recommended by neighbors, "quacks" and cults. They are indifferent about education, opposed to training. Of this number we have.....500 or 65%.

The third division includes children without homes or families, and of this number we have.....212 or 11%.

The number of patients reporting in person in connection with this survey was 347.

#### Health

We attempted to obtain the following information:

Health since leaving the hospital.

How are you handicapped now?

Do you wear appliances?

Have you normal use of your legs?

Have you normal use of your arms?

Have you normal use of your spine?

#### Disability of Lower Extremities

590 had involvement of lower extremities.

172 walked with some appliances.

10 are unable to walk.

325 walk unaided and are lame.

83 have no apparent disability.

Braces, canes, crutches, corrected shoes are included in "appliances."

#### Disability of Upper Extremities

Number with disability of arms.....	111 or 14%
Number wearing appliances.....	15
Number without full use of arm.....	65

#### Condition of Spine

Number with paralysis of the muscles of trunk.....	220
Of this number 180 have involvement of one or more extremities.	
Number wearing braces.....	172

#### Present Condition

Improved and improving.....	389
Improved and stationary.....	224
Stationary or questionable improvement.....	127
Unimproved or growing worse.....	28

#### Mental Development

In 1915 all children in the hospital were tested. For several years the testing was not routine. During the past two years all children are given mental test as routine as soon after admission as possible.

We find the average intelligence quotient of the 410 infantile paralysis cases examined to be.....93.4  
These children were not all tested by the same examiner and the time extended over nine years. The average intelligence quotient of 178 consecutive admissions, tested by the same examiner, is.....97.8

25.5 per cent are below .....	85
27.5 per cent are between .....	86 and 95
21 per cent are between .....	96 and 105
26 per cent are between .....	105 and 200

Of these below 85 per cent at least 10 per cent need institutional care.

Fifteen per cent may become self-supporting in occupations not requiring an educational foundation.

#### School Record

The number with sixth grade education or less.....	81
The number with seventh grade education.....	15
The number with eighth grade education.....	143
First year high school.....	42
Second year high school.....	29
Third year high school.....	9
Fourth year high school.....	35
First year college (including business college and special training)....	28
Second year college (including business college and special training)....	5
Third year college (including business college and special training)....	2
Fourth year college (including business college and special training)....	5
Number under 16 years of age and attending school:	
First, second, and third grades.....	46
Fourth, fifth, and sixth grades.....	30
Seventh and eighth grades.....	47

# Number of children over 16 years of age and attending school:

Eighth grade.....	27
First year high school.....	54
Second year high school.....	20
Third year high school.....	32
Fourth year high school.....	24
College.....	32

## Social Survey

- 11 per cent are married.
- 60 per cent over 21 years of age vote.
- 23 per cent have savings accounts.
- 15 per cent own or are paying on their homes.
- 50 per cent belong to clubs, fraternal organizations or social organizations.
- 60 per cent attend church.
- 5 per cent have held some public office.

## Vocational Survey

(Refers to those not in school)

Number who are self supporting.....	60 %
Number who are partly self-supporting.....	28 %
Number not earning.....	12 %

## Occupational Survey

Housework.....	43	Steamfitter.....	4
Farming.....	39	Newspaper employe.....	4
Dressmaker.....	34	Plumber.....	4
Teacher.....	23	Postal clerk.....	4
Clerk.....	19	Jeweler.....	3
Telephone operator.....	13	Nurse.....	3
Stenographer.....	12	Real estate dealer.....	3
Reed furniture.....	11	Plasterer.....	3
Mechanic.....	10	Photographer.....	3
Newsboy.....	10	Candy factory.....	3
Automobile business.....	10	Commercial advertising.....	3
Laborer.....	10	Baker.....	3
Bank employe.....	9	Typewriter repairer.....	2
Poultry raising.....	9	Library worker.....	2
Cook.....	9	Cigar factory.....	2
Milliner.....	7	Engraver.....	2
Express agent.....	5	Building contractor.....	2
Gardener.....	6	Lawyer.....	2
Telegraph operator.....	6	Barber.....	2
School for feeble-minded.....	6	Laboratory technician.....	2
Hairdressing and manicure.....	6	Truck driver.....	2
Bookkeeper.....	5	Draftsman.....	2
Elevator boy.....	5	Storekeeper.....	2
Salesman.....	5	Music teacher.....	2
Printer.....	5	Piano tuner.....	1
Chauffeur.....	4	Dentist.....	1
Cabinetmaker.....	4		

From the experiences of each one, we gather that the ultimate success or failure depends upon the morale of the individual. The wide range of results of the intelligence tests indicates the necessity for a flexible educational and vocational program. We also gather that there is no set line of "jobs" suitable for stated disabilities. The physically handicapped differ from one another in mental and temperamental characteristics. "It is not so much what one loses, but what one retains, that counts."

Mental ability and determination to win rise above apparent physical handicaps. One person overcoming what seems to be impossible will blaze the way for ten. Nowhere else is the value of example so apparent. Time determines to what extent these children have profited by their opportunities and with what intelligence, skill and understanding the work has been carried on thus far. We may estimate the money value of the treatment, the educational foundation, the incentive for vocational training, even the desire to become a live part of the social structure in which the cripple finds himself. Can we put down in figures or percentages the value of regaining the joy of living to which every child is entitled? Can we estimate the value of creating a desire for usefulness, a desire to compete, to create something of value, to get a view of life above and beyond the physical?

P. M. Hall, M. D., State Sanatorium: I should like to ask a question, although it is not exactly pertinent to the main body of the paper. Is the number of crippled children admitted to the institution with tuberculosis other than pulmonary, increasing or decreasing?

Miss McGregor: Decreasing, Dr. Hall. In 1914 there were from 40 to 50 children with the diagnosis of tuberculosis. Today the number is about the same. In 1914 there were from 60 to 70 children at the hospital. Now there are 242.

C. J. Swendsen, State Board of Control: Mr. Chairman—It would seem that Miss McGregor has followed the example set by Mr. Merrill in connection with the survey of the school at Owatonna. A few years ago, Mr. Merrill came out with a remarkably fine survey of the children at Owatonna. I think there were between four and five thousand children. As I recall it, 70 per cent had made good, 20 per cent had done fairly well, and 10 per cent were failures.

Miss McGregor made the statement that 60 per cent of the children are self-supporting, 28 per cent partly supporting, and 12 per cent dependent. That is a wonderful record, although not quite so strong as the record of the children at the state school; but when we take into consideration the handicap the crippled children have and always will have, I think it is marvelous.

I don't know of anything more valuable to the state and to all who are interested in this work than a survey of this kind. It shows results. The great question which will come to us and to citizens of the state and to members of the legislature is, Does it pay? It pays with a tremendous percentage. Sixty per cent of 3,500 children self-supporting? If they hadn't come to the institution they would, of course, have been dependent. Now they go out and not only make their own living but contribute to the welfare of the state; so, if you set aside the humane part of it—which is, of course, most important, for miracles are performed at the hospital—from a cold-

blooded, economic point of view, it is a wonderful investment. We are glad we have that hospital. Minnesota certainly ought to feel proud of it.

The only objection that might be made to the hospital for crippled children is that the family with an average income can not send children to the institution. The law specifically states that the hospital is for indigent cases only. The family who could afford to pay from \$25.00 to \$30.00 a month has no chance. I wish, with the enlargement of the hospital, the law might be amended so that those who are willing to pay a small amount, who can not afford to pay a large hospital bill and a doctor's bill, might have a chance. I hope in time that will come.

I enjoyed Miss McGregor's paper very much. I think it is valuable and should be spread throughout the state.

I wish a survey could be made of the children at Red Wing and Sauk Centre. The great question is, What becomes of these children? We say 75 per cent make good and become good citizens, but we have no definite way to prove the assertion.

**Florence Monahan, State Reformatory for Women:** May I ask Miss McGregor if anything is done at her institution along the line of vocational guidance?

**Miss McGregor:** The children who are able to do anything are encouraged to do that one thing. They may be in bed two or three years, and during that time not have very many opportunities to show what they are able to do.

We checked up a patient who had had one year's work in high school, and secured for him a scholarship at the Federal School of Commercial Design in Minneapolis. He took about two years of that work while he was flat on his back in bed with tuberculosis of the spine. He is ready to take a job now and is well qualified to earn his living.

Many of the children are too young for vocational training. They need the educational foundation first, but we try to find out what they will be prepared for and what they would like to do, and we advise them as to what they are physically able to do. They do not stop when they leave the hospital. Next year we will have seven scholarships at the University; in chemical engineering, in a technician's course, and in the department of music. There are a number who are taking a business course.

**Bianche L. La Du, State Board of Control:** I have listened with much pleasure and interest to Miss McGregor's paper. I wish to endorse all that Mr. Swendsen has said relative to the importance of such surveys. It is the only accurate way by which we can determine the value of our work; that is, by the results obtained.

As Mr. Swendsen said, there is great need of hospitalization for crippled children from the homes of those of small means. Whether or not they should be hospitalized at the place where we have indigent children, I am not prepared to say. We have the services of some 20 to 25 of the best physicians and surgeons of the Twin Cities. If any were pay patients, the question might come up as to whether or not the physicians should be paid. Perhaps some law to the effect that a moderate price be paid by those who can afford to pay, should be encouraged in the near future.

The board does take into consideration the fact that children of the family of small means need the treatment, and we give a very broad inter-

pretation to the term "indigent." We receive applications from many people who could afford to pay a small amount every month, and if we can possibly classify them as admissible cases, we do so. I think it was the intent of the legislature that we should take all we possibly could, but we aim not to take such cases to the exclusion of those who have no means whatever.

**Jos. E. Vance, School for the Blind:** I am very much interested in this survey, prepared by Miss McGregor. I am interested in any survey dealing with children of school age. I was also very glad to hear Mr. Swendsen refer to Mr. Merrill's survey. These surveys furnish valuable information.

It would be a fine thing if the results of these surveys could get into the hands of people who are constantly criticising the training which children in state institutions receive. They say they do not get enough opportunity to assert themselves, to show their initiative, to be independent, and all that sort of thing. These two surveys show conclusively, it seems to me, that the training which the children get in institutions is perhaps far above that which those same children would receive in their own homes.

I speak of this particularly because there is a certain crowd who are criticising the institutional training of the blind. They say children should be trained outside and have a chance to assert themselves and become independent. Nobody knows yet what results that thing is going to show. They have tried it for some time in the East, and in some cases, after they have finished the public school work, they have come back to the institution to finish training in the things which they really need and which schools for the blind are prepared to teach.

I should like to be able to make a survey of the blind of the state, to see how many of them have failed, how many have done fairly well and how many have made good. Of course, they do not make good in the same way that Mr. Merrill's children make good. We can not expect or hope to show such splendid results. This is all very interesting, and it is a very good thing to get before the people who are criticising institutional training.

**Mr. Swendsen:** They intend to build a hospital for crippled children in connection with the University. Will there be any charge at that hospital?

**Miss McGregor:** The University now charges \$3.00 a day for every patient admitted. I believe they charge \$7.50 for the operating room and \$2.00 for an X-ray.

Whether the policy of the University will be to charge the crippled children the same rate, I do not know. It will be a number of years before this hospital will be ready.

Admission to the Shriners Hospital is practically the same as at the state hospital. The cases are acted upon by the Shriners of each Temple instead of by the State Board of Control. They admit pro rata from each Temple. I think nine Temples are represented. They have a very large territory to serve. Their age limit is 15 years. They have 65 patients. I think they provide for admission from ten states.

**Galen A. Merrill, State Public School:** There is no question in relation to the work of the Hospital for Crippled Children, or for the State School for that matter, that interests us more than the question of results, how the children turn out. I think that question is asked much more often than any other by people who visit the institution.

Miss McGregor's survey, showing the results of the work at the insti-

tution, is certainly a very fine thing and will be a very valuable record for our library. I am very much interested in it.

Mrs. La Du: Do you find, that, under present treatment, the cases of infantile paralysis admitted to the hospital since the recent epidemic make a more rapid recovery than those admitted in 1916?

Miss McGregor: Under present treatment the recovery has been quite remarkable. We have sent children home in a year with no deformity and with all muscles acting, wearing some support for protection. Ten years from now we expect to have very different results from the cases receiving early treatment instead of waiting until after deformity had taken place.

Mrs. La Du: Last September the State Board of Health reported to our office almost 900 cases of infantile paralysis during the recent epidemic of 1924-1925. There were so many cases reported and the need was so urgent that we tried to have a state-wide clinic in order to find these cases and prescribe immediate treatment and get them into hospitals as soon as possible. The State Board reported later, however, that there were not so many serious cases in this recent epidemic as in 1916; that there were more recoveries; but at the same time there must be at least 500 or 600 cases in the state that are still in need of treatment because of the recent epidemic.

We were unable to secure the means by which we could finance a clinic of that kind, although we attempted to make it an emergency matter and have the State Board of Health and the Gillette hospital staff arrange clinics in various parts of the state in order to reach these cases and provide for proper treatment at as early a date as possible. I thought you might be interested to know that we did try to meet the situation but were unable to do so.

G. C. Hanna, School for Feeble-Minded: I should like to ask Miss McGregor whether or not anyone knows what percentage of infantile paralysis cases suffer physical handicaps as a result of disease. Not all, surely?

Miss McGregor: I should not be able to give any percentage on that, but I think there were 83 in this lot that did not have any disability; the paralysis apparently entirely cleared up.

Of the 900 cases mentioned by Mrs. La Du, which later came closer to 1,100, all were not reported. The Board of Health's report would indicate that perhaps 600 of that number did not have a complete recovery.

Mr. Hanna: What part suffered mental handicaps?

Miss McGregor: I think Dr. Hall and some of the other doctors would tell you that less than one per cent with infantile paralysis have any mental handicap.

Mr. Hanna: That would correspond with our record. We get a great many children, of course, who have had infantile paralysis whose mental condition is attributed to that.

Miss McGregor: I think we have never had a case of infantile paralysis where it involved the mind. Cerebral spastic is another story.

Mr. Hanna: I think Miss McGregor's paper was a very splendid one, ably prepared, and representative of a great work, and she is entitled to much credit for giving us such a paper. I agree with Mr. Swendsen and Mrs. La Du that it is information which the public should have because it is very creditable to the institutional system of Minnesota.

Mrs. La Du: I should like to ask Miss McGregor, or some of the physicians here, as to whether there are any recent opinions with regard to the contagious nature of infantile paralysis. We know many consider it very contagious; others believe it is not. There are families where they have had several cases, but in many families only one case.

Miss McGregor: Last fall, after the School for the Deaf had started its year's work, Mr. Stevenson discovered that Bert Rand had had infantile paralysis during vacation, and he sent him to us. We learned that ten of the family had had infantile paralysis, two with very bad results.

During the last year and a half, especially, reports of two, sometimes three, sometimes four and five cases, in the same family have reached us.

Arthur F. Kilbourne, M. D., Rochester State Hospital: I was very much interested in Miss McGregor's paper. The state is certainly to be congratulated upon having an institution of this kind and under such splendid management. It is unfortunate that the hospital is not large enough to take in all of those on the waiting list, because their only hope is training and long continued treatment.

It is to be regretted that the onset of this disease is so often unrecognized. Information regarding the initial symptoms should be widely disseminated. Where you have a case of vomiting, headache, stiffness of the neck, fever, twitching of the muscles, and a spinal puncture shows an increased cell count and globulin content, then the serum should be administered, especially in an existing epidemic. This serum can be obtained from Dr. Rosenow, of the Mayo Clinic.

Dr. Rosenow reports that, of 60 patients treated in the early stages by the serum, none died and all recovered without residual paralysis. In 61 patients who were treated after a slight paralysis had set in, all but one recovered; of 123 patients with advanced paralysis, 18 died, 30 had residual paralysis. The first group was treated in one and one-half days; the second group, in slightly over two days; and the third group was treated in five and one half days.

In the Rochester State Hospital we reserve two positions for crippled young men and we generally have two or three occupying these positions.

Dr. Hall: I don't think that the medical profession have learned more about contagion of infantile paralysis than they knew ten or twelve years ago. They still carry on isolation and segregation to prevent its possible spread, but they do not know anything about it.

Miss McGregor: The Minnesota Public Health Association arranges for clinics in different parts of the state where there is a county nurse (one of our requirements), and the doctor who is assigned to each clinic is a member of the Orthopedic Club, which is made up of men who are limited to orthopedic practice. At present, I think clinics are being held in Tracy, Winona, Moorhead, Morris and Brainerd, usually on Saturday. The county nurse notifies the possible patient—it does not matter whether they are poor or not—to come to the clinic. We are sending a nurse from the hospital who is familiar with the records, in order to keep the records as they should be kept. One copy of that report comes to us, one to Dr. Chatterton, one to the Minnesota Public Health Association and one goes back to the county. This is the third year for this work.