

Hospital Insurance Against Poliomyelitis In Des Moines, Iowa, 1952

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THE SEVERE poliomyelitis epidemic in Des Moines, Iowa, during 1952 occasioned an evaluation of one aspect of the medical care costs of this disease—the status of hospitalization protection by various types of health insurance. The city had experienced four minor outbreaks of the disease between 1946 and the summer of 1952. The greatest number of recorded cases during these years was 90 in 1949.

The 1952 Des Moines experience of 316 poliomyelitis cases in a total population of 184,970, a rate of 170.8 per 100,000, permitted an investigation of the extent of coverage by the unique poliomyelitis insurance available since 1949, as well as that of Blue Cross and health and accident policies. Population for 1952 was estimated by projecting changes of each age group and race within each census tract from 1940 to 1950 into 1952.

The study was limited to payment of bills for hospitalization of poliomyelitis patients, exclusive of medical fees. The cost of special duty nursing, and outpatient department and rehabilitation services, if a part of the patient's hospital bill, was included. The study started June 23, 1952, and the cutoff date was April 1, 1953.

The initial cases of the epidemic occurred the week of June 23, 1952, the outbreak reaching a

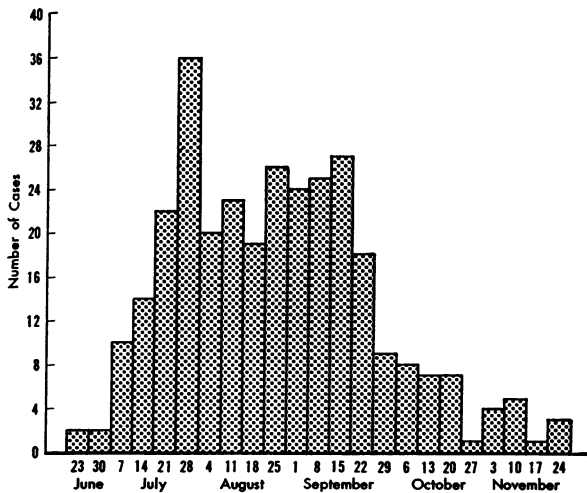
plateaulike maximum the week of July 21, and starting its decline the last of September. The onset of reported cases is shown in figure 1. The spread of the disease throughout the city lacked any pattern.

No cases of poliomyelitis occurred in the age group 60 and over; 4 cases were reported under 1 year of age. The youngest child was 6 weeks old. The Negro population of 8,786 had 3 cases of poliomyelitis in the age group 5–9 and was excluded from the study. Since the oldest patient was 54 years old, the white population through 59 years of age was utilized as the population potentially at risk. There were 313 cases in 151,972 white persons. This population includes the relative handful of persons who had had poliomyelitis, as well as the undetermined and larger group which had experienced subclinical disease.

The population was divided into 3 socioeconomic groups by utilization of the 1950 census data and by local health department information as well (1, 2). In group I, the population had annual incomes greater than \$5,000; professionals, merchants, and executives predominated. Their homes were valued at an average of over \$9,000. Group II was composed mainly of white-collar workers, skilled manual laborers, and storekeepers. Their incomes were between \$2,000 and \$5,000. Included in group III were unskilled and transient laborers, pensioners, and the bulk of the nonwhite population. Income in this group was less than \$2,000 annually, and the average value of their homes was less

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Trend of poliomyelitis epidemic by week of onset of illness, Des Moines, Iowa, 1952.



than \$5,000. Factors such as lack of adequate plumbing facilities and the ratio of persons per room were also utilized in assigning socioeconomic group.

Hospital cases were assumed to be in the income bracket typical of the census tract in which they lived. This assumption may allow a certain amount of error to enter the study.

Twenty-seven percent of the population was in group I, 57 percent in group II, and 16 percent in group III. The attack rate by group is shown in table 1.

The highest attack rate was in group I, an observation supported generally by earlier studies (3-5). There was a tendency only toward a higher incidence in males under age 10 and females aged 15 and older. The highest attack rate was in age group 5-9 for both sexes. However, 33.3 percent of the cases in group I, 26.7 percent in group II, and 17.4 percent in group III were adults (5, 6).

A summation of the total hospital service costs for 288 hospitalized patients computed to April 1, 1953, is presented in table 2. Twenty-five of the 313 patients were cared for in their own homes. The data show the total of patient hospital bills paid by each method of payment within each socioeconomic level. In all economic levels multiple sources of payment were observed. Poliomyelitis insurance was the category least involved with other forms of financial settlement.

All information concerning costs was

obtained from the bills tendered each patient by the hospital. These contained the sources and amounts of payments. Since we have no information as to the insurance holdings of each patient, the data on individuals and families utilizing any of the methods of payment are perforce minimal.

The minimal extent of poliomyelitis, health and accident, and Blue Cross insurance in the families within each socioeconomic level is shown in table 2. The figures for poliomyelitis insurance are considered the most accurate since this type of insurance gave the broadest coverage and used supplemental payment by other forms of insurance least. There was considerable overlapping between all the other sources of payment.

The financial assistance of the National Foundation for Infantile Paralysis was primarily to those families without insurance, but also supplemented health and accident and Blue Cross insurance to cover the cost of such items as special duty nursing and appliances.

The total presented for the foundation does not account for the considerable amounts spent by the foundation for such items as special equipment, supplies, medical social workers, physical therapists, and general duty nurses. These costs do not appear on the patient's hospital bill. Nor was the monetary value of the assistance of some 250 volunteer lay hospital aides trained by the foundation charged to the patients.

The important aspect, however, is the extent of health insurance coverage within the three socioeconomic groups. Only 11 families in group I (11.2 percent), 18 families in group II (13.1 percent), and 10 families in group III (25 percent) did not have some form of health insurance against poliomyelitis. Although the number of families within each socioeconomic group is small, it is considered that they may be a reasonably representative sample of families with children in respect to personal financial responsibility for illness due to poliomyelitis. Three families in group I, 9 families in group II, and 5 families in group III did not have any children in the household. Since no data were available on the ratio of childless families within the census tracts or city as a whole, and, as the sample of such families within this study

is quite small, no firm conclusions can be drawn. However, the extent of health insurance coverage found among Des Moines poliomyelitis patients during 1952 suggests a high degree of such health insurance protection against this disease in the community.

Table 3 shows the results of a survey of the

actual physical status of patients within each socioeconomic group, as of April 1, 1953. A detailed study of the pediatric aspects has been presented elsewhere (7). The mild residual category is limited to those cases with a progressively decreasing muscle weakness, without paralysis. Those in the moderate residual

Table 1. Poliomyelitis cases and attack rates among the white population, according to socioeconomic group, by sex and age group, Des Moines, Iowa

Age group (year)	Male			Female			Total		
	Popula- tion	Cases	Rate per 1,000	Popula- tion	Cases	Rate per 1,000	Popula- tion	Cases	Rate per 1,000
Group I									
0-4	2,507	15	5.98	2,257	8	3.54	4,764	23	4.83
5-9	1,891	12	6.35	1,886	14	7.42	3,777	26	6.88
10-14	1,485	10	6.73	1,432	9	6.28	2,917	19	6.51
15-19	1,102	4	3.63	1,338	6	4.48	2,440	10	4.10
20-29	2,809	6	2.14	3,391	15	4.42	6,200	21	3.39
30-59	9,783	8	.82	11,082	10	.90	20,865	18	.86
Total	19,577	55	2.81	21,386	62	2.90	40,963	117	2.86
Group II									
0-4	5,091	21	4.12	4,932	16	3.24	10,023	37	3.69
5-9	3,872	21	5.42	3,824	18	4.71	7,696	39	5.07
10-14	3,518	9	2.56	3,347	7	2.09	6,865	16	2.33
15-19	3,119	8	2.56	3,652	10	2.74	6,771	18	2.66
20-29	8,465	9	1.06	9,390	11	1.17	17,885	20	1.12
30-59	17,626	6	.34	20,154	14	.69	37,780	20	.53
Total	41,691	74	1.78	45,299	76	1.70	86,990	150	1.72
Group III									
0-4	1,182	8	6.77	1,146	4	3.49	2,328	12	5.15
5-9	822	8	9.73	817	2	2.45	1,639	10	6.10
10-14	793	2	2.52	737	4	5.43	1,530	6	3.92
15-19	761	3	3.94	1,162	7	6.02	1,923	10	5.20
20-29	2,666	2	.75	3,101	2	.65	5,767	4	.69
30-59	5,222	1	.19	5,610	3	.53	10,832	4	.37
Total	11,446	24	2.10	12,573	22	1.75	24,019	46	1.92
City									
0-4	8,780	44	5.01	8,335	28	3.36	17,115	72	4.21
5-9	6,585	41	6.23	6,527	34	5.21	13,112	75	5.72
10-14	5,796	21	3.62	5,516	20	3.63	11,312	41	3.62
15-19	4,982	15	3.01	6,152	23	3.74	11,134	38	3.41
20-29	13,940	17	1.22	15,882	28	1.76	29,882	45	1.51
30-59	32,631	15	.46	36,846	27	.73	69,477	42	.60
Total	72,714	153	2.10	79,258	160	2.02	151,972	313	2.06

Table 2. Payment sources of poliomyelitis patients' ¹ hospital bills by socioeconomic group, Des Moines, Iowa, 1952

Payment source (all or part)	Number of patients ¹	Number of families	Total amount paid	Percent of total	Average cost per patient
Group I					
Poliomyelitis insurance.....	53	50	\$32,404.05	61.9	\$611.40
Health and accident.....	12	12	3,460.62	6.6	288.39
Blue Cross.....	34	33	10,309.14	19.7	303.21
Poliomyelitis foundation.....	15	13	4,210.21	8.0	280.68
Family.....	24	24	2,011.31	3.8	83.80
Total.....			52,395.34	100.0	(²)
Group II					
Poliomyelitis insurance.....	55	52	\$26,917.51	33.5	\$489.41
Health and accident.....	34	34	9,848.53	12.3	289.66
Blue Cross.....	44	44	13,662.08	17.0	310.50
Poliomyelitis foundation.....	50	50	26,955.93	33.5	539.12
Family.....	17	17	2,988.01	3.7	175.77
Total.....			80,372.06	100.0	(³)
Group III					
Poliomyelitis insurance.....	8	8	\$1,935.63	13.5	\$241.95
Health and accident.....	8	8	2,138.50	14.9	267.31
Blue Cross.....	21	19	5,638.96	39.3	268.52
Poliomyelitis foundation.....	16	16	3,723.62	25.9	232.73
Family.....	8	8	918.06	6.4	114.76
Total.....			14,354.77	100.0	(⁴)
Grand total					
Poliomyelitis insurance.....	116	110	\$61,257.20	41.6	\$528.08
Health and accident.....	54	54	15,447.65	10.6	286.07
Blue Cross.....	99	96	29,610.18	20.1	299.09
Poliomyelitis foundation.....	81	79	34,889.76	23.7	430.74
Family.....	49	49	5,917.38	4.0	120.76
Total.....			147,122.17	100.0	(⁵)

¹ Some patients used more than 1 type of insurance.

² Average payment of 105 hospitalized patients, \$499.

³ Average payment of 140 hospitalized patients, \$574.09.

⁴ Average payment of 43 hospitalized patients, \$333.83.

⁵ Average payment of 288 hospitalized patients, \$493.69.

group were characterized by paralysis of one limb or the equivalent. In the moderately severe residual group were those with paralysis of two limbs or the equivalent, and the severe residual category contained patients with more extensive paralytic complications than the moderately severe group.

The classification of patients cannot be absolute. The classification of each patient was

made with no knowledge of his socioeconomic status. The data in table 3 suggest that there was a less severe grade of poliomyelitis in the lowest economic group (5). This small difference cannot be related, however, to the observed incidence levels (table 1). If the home care group, which fell into the no residual or mild residual group, were added to the hospitalized cases, there would be a less than 2-

Table 3. Physical status of 288 white hospitalized patients as of April 1, 1953, by socioeconomic group, Des Moines, Iowa

Physical status	Group I		Group II		Group III	
	Number of patients	Percent	Number of patients	Percent	Number of patients	Percent
No residual.....	50	47.6	69	49.3	29	67.4
Mild residual.....	29	27.6	37	26.4	8	18.6
Moderate residual.....	10	9.5	15	10.7	2	4.7
Moderately severe residual.....	9	8.6	8	5.7	2	4.7
Severe residual.....	4	3.8	5	3.6	1	2.3
Deaths.....	3	2.9	6	4.3	1	2.3
Total.....	105	100.0	140	100.0	43	100.0

percent change in the combined no residual and mildly affected categories, as well as the combined moderately severe and severely affected categories in all 3 socioeconomic groups.

Summary

A high degree of privately purchased financial protection against poliomyelitis hospital costs was shown by a study of hospital billing to poliomyelitis patients in the Des Moines, Iowa, white population during the severe 1952 epidemic. These costs do not, however, include the considerable sums spent by voluntary and official health agencies or the assistance of volunteer lay groups and individuals. Health insurance extended throughout the 3 socioeconomic levels and covered 88.8 percent in group I, 86.9 percent in group II, and 75 percent in group III. The 288 hospitalized cases involved 275 families, of which 110 (40 percent) utilized poliomyelitis insurance, 54 (20 percent) utilized health and accident insurance, and 98 (36 percent) utilized Blue Cross coverage to pay all or part of their hospital bills. The type of insurance varied between the 3 socioeconomic levels. The highest policy holdings and utilization of poliomyelitis insurance

data are presented and briefly discussed. Cross was in group III. Pertinent morbidity data are presented and briefly discussed.

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