Comparative study

Health Experiences of Elderly Persons in Public Housing Projects

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THE SPRINGBROOK Health Maintenance Unit, a medical care program for the elderly in a housing project, was established through the cooperative efforts of the Mount Sinai Hospital, the Cleveland Metropolitan Housing Authority, and the Public Health Service (*1*).

At the Springbrook Health Maintenance Unit the services of physicians, a nurse, and a social worker were given during an 8-hour day, 5 days a week, and included home visits when necessary. The nurse made house calls to care for patients recently discharged from the hospital and to ascertain if a physician were needed to diagnose or treat an illness. Her services frequently obviated physicians' visits. Among the social worker's many projects were establishing a carryout lunch program from a nearby golden age center and arranging for home aide services from community agencies for patients who could be maintained at home or those who were temporarily incapacitated.

Emergency care, at first provided by medical residents from the hospital on a 24-hour basis, was discontinued in October 1965, and patients relied on the police ambulance to take them to the emergency room for treatment. Although discontinuance of night service eliminated a desirable part of our services, it also thwarted habitual callers for unnecessary night care. Visits to the hospital's emergency room did not increase significantly after the night service stopped.

The podiatry unit, an important adjunct to the medical services, was set up in 1964 because many registrants had chronic foot problems and were reluctant to wait long periods for appointments at Mount Sinai Hospital. The podiatrist came a half day weekly.

This paper deals primarily with the work of the Springbrook Health Maintenance Unit from 1963 through 1965 and compares the beneficiaries of the unit's services with a similar group living in Wade Apartments, a similar building without a health unit.

Approximately 70 percent of the persons studied at Springbrook were women, and the number of persons in each 5-year age group remained essentially unchanged during the 3 years (table 1). Also unchanged were the percentages of persons living alone and those living with a spouse or relative. Data on enrollment at Springbrook follow.

Registrants	*1963*	*1964*	*1965*	*1963–65*
New enrollees	186	49	18	253
Dropouts	10	20	14	44
Patients died	6	8	9	23
Participants, Dec. 31	170	191	186	

Of the 44 persons who dropped out, 26 left for nonmedical reasons, and the other 18 moved

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from their apartments when they needed more extensive medical and nursing services than were available in a residential setting.

Services of the Health Maintenance Unit

During the 3-year period the medical office recorded 7,672 visits. The combined scheduled and emergency office visits amounted to some 1,800 visits per year, or three physicians' visits per patient every 4 months (table 2).

From 1963 through 1965 Mount Sinai Hospital's pharmacy filled a total of 3,148 prescriptions for Springbrook patients, and the total cost was $5,820.51. In 1963 the pharmacy filled 717 prescriptions and charged $1,166.92, in 1964 the charge was $1,897.37 for 1,080 prescriptions, and in 1965 the 1,351 prescriptions cost $2,756.22.

The number of prescriptions averaged a few more than 1,000 per year, and the average cost was approximately $1.85 each. Some prescriptions were filled in other pharmacies, but the cost data were not available.

All active registrants received a complete physical examination, including laboratory work and X-rays, every year. Visits to the health maintenance unit were the type a patient usually would make to his family physician. Visits to Mount Sinai Hospital's outpatient clinic simulated referral to a physician-specialist, a laboratory, or a radiologist. Referrals to the ophthalmology clinic were the most frequent (table 3).

Table 2. Springbrook registrants' office visits and house calls, health maintenance unit, 1963-65

Type of visit	1963	1964	1965	1963–65
Total	1, 814	2, 757	3, 101	7, 672
Office:				
Scheduled	1, 228	1, 554	1, 673	4, 455
Emergency	410	290	355	1, 055
Podiatry	-----	651	854	1, 505
House calls:				
Nurse	64	89	144	297
Physician (sometimes with nurse)	60	109	40	209
Night (physician)	52	64	35	151

Inhalation therapy was given primarily to patients with chronic pulmonary emphysema, and physical and speech therapy were given to those with severe osteoarthritis or the residuals of cerebrovascular accidents.

Although spot checks of urine for glucose and acetone were made in the unit, most urine specimens were sent to the laboratory for more detailed examination. Determining hematocrit values, hemoglobin levels, and white blood cell counts constituted the bulk of the hematology services. Ascertaining levels of blood sugar, uric acid, and blood urea nitrogen accounted for most of the work in the chemistry laboratory.

Table 1. Age, sex, and living arrangements of Springbrook registrants, 1963–65, and Wade residents, 1963

Category	Springbrook registrants, 1963 (N=186)		Springbrook registrants, 1964 (N=235)		Springbrook registrants, 1965 (N=253)		Wade population, 1963 (N=308)		Wade control group, 1963 (N=230)	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Sex:										
Men	56	30. 1	71	30. 2	78	30. 8	73	23. 6	53	23. 0
Women	130	69. 9	164	69. 8	175	69. 2	235	76. 2	177	76. 9
Age group (years):										
59 or under	8	4. 3	8	3. 4	10	4. 0	19	6. 1	0	------
60–64	19	10. 2	24	10. 2	25	9. 9	24	7. 7	15	6. 5
65–69	47	25. 3	60	25. 5	67	26. 5	67	21. 6	54	23. 4
70–74	50	26. 9	62	26. 4	68	26. 9	84	27. 2	67	29. 1
75–79	37	19. 9	49	20. 9	51	20. 1	76	24. 6	64	27. 8
80 or over	25	13. 4	32	13. 6	32	12. 6	38	12. 3	30	13. 0
Living arrangement:										
Alone	106	57. 0	131	55. 7	138	54. 5	200	64. 9	159	69. 1
With spouse or relative	80	43. 0	104	44. 3	115	45. 5	108	35. 0	71	30. 8

Chest X-rays, barium enemas, and the gastrointestinal series were the most frequent roentgenographic services. Postoperative roentgen therapy was given to ambulatory patients discharged from the hospital after an operation for cancer.

Laboratory, X-ray, and consultation services were requested on the same basis as in the private practice of internal medicine. These services were not requested after detailed research, but their use was consistent with the competent practice of medicine.

Table 3. Visits to outpatient clinics and laboratory and X-ray procedures, Springbrook registrants, 1963–65

Clinic visits and procedures	Visits	
	3-year total	Annual average
Outpatient clinic visits	1,743	581
Allergy	8	3
Arthritis	2	1
Dental	145	49
Dermatology	92	31
Diabetes	100	33
Ear, nose, and throat	40	13
Gynecology	35	12
Hematology	6	2
Neoplastic	1	0
Neurology	4	1
Ophthalmology	490	163
Orthopedics	35	12
Podiatry (1 year only)	59	16
Proctology	3	1
Psychiatry	30	10
Pulmonary function	1	0
Surgery	69	23
Urology	57	19
Therapy:		
Inhalation	314	105
Physical	144	48
Speech	108	39
Laboratory procedures	1,787	595
Bacteriology	25	8
Chemistry	198	66
Hematology	687	229
Pathology	82	27
Serology	13	4
Urinalysis	771	257
Other	11	4
X-ray department services	758	253
Barium enema	40	13
Chest X-rays:		
Posterior, anterior, and lateral	188	63
Miniature	344	115
Gallbladder series	11	4
Gastrointestinal series	37	12
Intravenous pyelograms	18	6
Roentgen therapy	58	19
Others	62	21

Other Medical Services

Occasionally private physicians were consulted. There were nine such consultations in 1963, during 1964 there were 11, and in 1965 there were 17.

During the 3-year period 110 persons, or approximately 40 percent of the project's residents, were admitted to the hospital at least once (table 4). Most of the 247 admissions to a hospital were made directly from the patient's residence. The remainder were transfers between short-stay and chronic disease hospitals. Of the direct admissions, 179 were to short-stay hospitals, but most of the eight transfers were to chronic disease hospitals after the patient had been in a short-term hospital. Other types of hospital contacts were as follows.

Hospital utilization	*1963*	*1964*	*1965*	*1963–65*
Admitted for 8 hours or less	8	6	13	27
Treated in emergency room	15	25	30	70

Financial Analysis of Health Services

Medical Services at Springbrook usually were not free. Patients were charged according to ability to pay, since many received public assistance with no allocation for health care. A $2 registration was charged to initiate the patient's record file or other forms and administrative procedures. Each patient was classified on the basis of his net monthly income. The range was from $150 or more in the standard or S class to $55 or less in the C class (table 5).

Fees for laboratory procedures, X-rays, and other outpatient services at Mount Sinai Hospital also were assessed by financial class. For example, charges for blood chemistry studies were

Table 4. Hospital admissions and days of stay, Springbrook registrants, 1963–65

Type of admission and stay	Type of hospital		
	Short-term	Chronic disease	Mental
Admissions	187	56	4
Direct	179	19	4
Transfer	8	37	0
Total days	2,836	1,393	148
Average stay (days)	15.24	24.87	37

Table 5. Number of visits, by financial class of Springbrook registrants, 1963–65

Class and fee per visit	Visits			
	1963	1964	1965	1963–65
S–$2	44	69	28	141
D–$1	320	539	408	1, 267
A–$0.50	376	526	739	1, 641
B–$0.25	462	729	873	2, 064
C–0	294	468	516	1, 278
Aid for the aged [1]	312	423	536	1, 271
Nonregistered–$2	6	3	1	10

[1] The State of Ohio paid $7.70 per visit in 1963, $8.93 in 1964, and $8.99 in 1965.

$0.50, blood counts were $0.50, barium enemas were $6.50, chest X-rays were $3, and gallbladder examinations were $6. Classes S and D paid the full fee, class A, half the fee, and classes B and C, nothing. Springbrook patients paid for prescriptions at the hospital pharmacy at cost plus 25 percent regardless of financial class.

Over the 3-year period the total expenditures for the unit were $370,441, and the total income was $355,629 (table 6). The deficit per ambulatory patient in 1963 was $1 for 153 persons, and in 1964 it was $3 for each of 188 persons. By 1965 there was a surplus per ambulatory patient of $4 for 187 persons. For inpatients, however, there was a deficit per patient for all 3 years: $20 in 1963, $35 in 1964, and $26 in 1965.

The Control Group at Wade Apartments

The control population, which also was observed for 3 years, lived in Wade Apartments, another public housing estate managed by the Cleveland Metropolitan Housing Authority. Approximately two blocks from the Springbrook Estates, Wade Apartments is a 16-story building similar in construction to the Springbrook structure except that Wade has no medical facility.

To obtain a control group, 230 of the 308 Wade residents were interviewed. The family incomes of the respondents at Wade and those

Table 6. Summary of costs for Springbrook Health Maintenance Unit, 1963–65

Item	1963	1964	1965
Expenses			
Total expenses	$92, 321	$135, 686	$142, 434
Total cost for ambulatory patients	59, 108	64, 949	67, 446
Operating expenses	44, 094	54, 168	55, 338
Equipment purchases	6, 270	0	0
Estimated cost of rent, heat, and electricity supplied by metropolitan housing authority [1]	8, 540	8, 540	8, 540
Mount Sinai Hospital outpatient services	8, 744	10, 781	12, 108
Total cost for inpatients	33, 213	70, 737	74, 988
Mount Sinai Hospital	21, 652	48, 045	58, 972
Other hospitals	11, 561	22, 692	16, 016
Income			
Total income	$88, 734	128, 511	138, 384
Total grant and charges	58, 847	64, 242	68, 226
Public Health Service grant	56, 514	57, 986	60, 797
Fees from patients	769	1, 040	1, 015
Aid for Aged	26	2, 734	3, 076
Charges for Mount Sinai Hospital's outpatient department services and drugs	1, 538	2, 482	3, 338
Total private hospitalization insurance payments	29, 887	64, 269	70, 158
Mount Sinai Hospital	20, 907	43, 556	55, 310
Other hospitals	8, 980	20, 713	14, 848
Net program cost	3, 587	7, 175	4, 050

[1] Not actually charged and not included in total expenses.

of Springbrook registrants were roughly comparable, those at Springbrook being slightly higher.

Income range (per annum)	*Springbrook (percent)*	*Wade (percent)*
Under $1,000	11	20
1,000–1,499	43	46
1,500–1,999	20	21
2,000–2,499	15	7
2,500–2,999	6	4
3,000–3,499	3	2
3,500–3,999	2	0

To compare the health experiences of these two groups, one would have to ascertain the respective levels of their health. If one group suffered more illness than the other, there could be no valid comparison. Ideally, random alternate selection of tenants moving to either Wade or Springbrook would have been the best method of selecting both groups. However, Wade Apartments were rented before Springbrook Estates, so another method had to be evolved.

With the aid of 30 board-certified internists from Mount Sinai Hospital, a health questionnaire was devised. The questions involved certain arbitrary parameters for measuring a person's physical status and functional capabilities to ascertain his general overall state of health. These measurements (see box) were applied to the first 176 registrants at Springbrook and to 123 interviewees from Wade, all of whom were given a physical examination. The examination included blood analysis, urinalysis, miniature chest X-ray, and electrocardiogram.

Wade and Springbrook Groups Compared

The average health rating of Springbrook registrants was 7.40 and that of the Wade examinees was 7.92, which suggested that the two

Health Status Index

Observation	*Score*
Diastolic blood pressure:	
A. Under 90	0
B. 91–100	1
C. 101–110	2
D. 111 or greater	3
Urine:	
A. Microscopic abnormality—more than 4 RBC or 8 WBC/HPF or both	1
B. Albumin	2
C. Reducing substance	3
D. Combination of A and B	3
Hematocrit:	
A. Men (47.0±7.0):	
36–39	1
32–35	2
Less than 32	3
B. Women (42.0±5.0):	
33–37	1
30–32	2
Less than 30	3
Electrocardiogram:	
RBBB	0
Occasional PAB or PVC	1
Sinus tachycardia	1
Nonspecific T wave changes	2
P wave abnormalities	2
All other abnormalities	3
Apical rate and rhythm:	
Sinus bradycardia	1
RSR less than 110	0
RSR 110–129	1
RSR 130–150	2
RSR greater than 150	3
Grossly irregular rhythm	3
Gallop rhythm	3
Palpation of abdomen:	
Splenomegaly	2
Liver greater than 2.5 inches below RCM	2
Abdominal mass other than hernia	3
Ascities	3
Peripheral edema (observer's opinion)	0–3
Funduscopy:	
A. Mild narrowing or sclerosis of retinal vessels	0
B. Moderate to marked sclerosis of the retinal arterioles with exaggerated light reflex arteriovenous compression and irregular narrowing of the arterioles	2
C. Basic condition as presented in B, but with exudates, hemorrhages, and retinal edema	3
D. Basic conditions as presented in C, but with measurable edema of discs	3
Miniature chest roentgenogram:	
A. Rib anomaly	0
B. Lung anomaly	0
C. Pleural scarring	1
D. Calcified pleura	1
E. Calcified nodes	1
F. Calcified scar, lung	2
G. Abnormal aorta	2
H. Acquired bone lesion	3
I. Pleural effusion	3
J. Abnormal heart	3
K. Mediastinal mass	3
L. Pulmonary lesion	3
Functional rating:	
A. Is there any physical condition that bothers you now?	No=0; Yes=1
B. Are you able to walk up and down 1 flight of stairs?	No=2; Yes=0
C. Are you able to walk half a mile (about 8 blocks)?	No=3; Yes=0

Table 7. Health index ratings of Springbrook registrants and Wade examinees, 1963

Health index rating	Springbrook registrants		Wade examinees	
	Persons	Rating	Persons	Rating
0	5	0	1	0
1	11	11	7	7
2	16	32	4	8
3	15	45	9	27
4	14	56	14	56
5	13	65	7	35
6	16	96	8	48
7	11	77	10	70
8	10	80	10	80
9	12	108	12	108
10	9	90	7	70
11	9	99	10	110
12	6	72	7	84
13	5	65	3	39
14	5	70	3	42
15	3	45	4	60
16	4	64	2	32
17	3	51	1	17
18	5	90	0	-------
19	1	19	0	-------
20	0	---------	2	40
21	0	---------	2	42
22	2	44	0	-------
24	1	24	0	-------
Total	176	1, 303	123	975
Average health rating		7. 40		7. 92

groups had approximately the same degree of health as measured by the index (table 7).

At 3- to 4-month intervals Wade participants were visited by the research assistant, who each time documented their health experiences and expenses. More accurate information could be obtained in this relatively short period than after waiting a longer time for a recapitulation of a medical history.

The most important factors to compare in the two populations were (*a*) mortality, (*b*) hospital admissions, (*c*) length of hospital stays, (*d*) moves from the apartments, (*e*) visits to physicians or clinics, (*f*) out-of-pocket payments for medical care, and (*g*) followup of persons no longer with the program.

The percentage of residents at the end of the 3-year study in both the Wade and Springbrook groups was approximately the same (table 8). The dropout rate, for whatever reason, was also proportionately the same. The mortality of the two groups does not appear to be significantly different during the test period. However, the death rate may be more meaningful after a 5-year observation period.

Seven of the 10 persons who left Springbrook because they needed more extensive medical and nursing care died within 3 months in contrast to three of the six persons who moved from Wade for the same reason. Perhaps medical facilities such as the Springbrook Health Maintenance Unit keep the elderly independent until it is impossible for them to be maintained alone in their homes or with the aid of community resources.

The numbers of patients admitted to the hospital at least once over the 3-year period was 9 percent higher in the Springbrook group than in the Wade group. This difference probably is based on (*a*) the existence of the medical unit with its diagnostic orientation and capability of frequent observation and (*b*) the ease of admission to the hospital from the health unit. The availability of professional care also is reflected in the total number of hospital admissions (247 for the Springbrook group compared with 130 for the Wade group), partic-

Table 8. Status of persons no longer with the program, December 1965

Status	Springbrook	Wade control group
Total	253	230
Still in the program	186	159
No longer under investigation	67	71
Died	23	31
Moved for medical reasons	18	12
Later died	[1] 10	[2] 6
Living in a nursing home	8	6
Moved for nonmedical reasons	11	8
Living	6	5
Unable to contact	3	2
Later died	1	1
Living in a nursing home	1	0
Dropped out, but stayed in building	15	20
Still living in building	12	14
Later died	1	4
Later moved for medical reasons	1	1
Later moved for nonmedical reasons	1	1

[1] Seven died within 3 months after moving, 3 within 1 year.

[2] Three died within 3 months after moving, 2 within 1 year, 1 after 2½ years.

ularly to the short-stay hospitals (table 9). It was impossible to differentiate between the numbers of days Wade patients were hospitalized for chronic diseases or acute, short-term illnesses. No persons from Wade were admitted to a mental hospital.

The total number of hospital-days reflect many diverse factors, not the least of which is the prompt discharge of patients who have attained maximum benefits from hospitalization. Lack of aftercare is a major factor in long, expensive hospital stays, and for Springbrook patients such stays were an average of 4.5 hospital-days less than for Wade patients. This statistically significant difference probably was due in part to the existence of the health unit. Just as the health unit facilitated early and frequent admissions to the hospital, it also encouraged early discharges from the hospital.

Only 11 persons, or 10 percent of Springbrook's hospitalized patients, spent additional convalescent days at the homes of relatives or friends or in nursing homes in contrast to the 29, or 37 percent, of Wade residents who were hospitalized.

Table 9. Comparison of health experiences of Springbrook registrants and Wade control group, 1963–65

Variable	Springbrook	Wade
Persons admitted to the hospital at least once	110	79
Number of admissions to a hospital	247	130
Total number of hospital days	4, 377	2, 893
Average stay per admission (days)	17. 7	22. 2
Persons who stayed at the homes of relatives or friends or at nursing homes[1]	11	29
Visits to physicians or clinics	[2] 8, 849	3, 843
Visits to physicians or clinics not made because of cost or inconvenience	0	620
Medications not taken because of cost	0	126
Out-of-pocket payments	$10, 182	$32, 706
Physicians' or clinic fees	4, 361	14, 620
Medications	5, 821	16, 369
Transportation	0	1, 717

[1] Springbrook patients spent 295 nonhospital days away from home. The number of nonhospital days Wade patients were away from home was not available.
[2] Excludes 566 visits for inhalation, physical, or speech therapy during which the patient saw only the therapist.

Conclusions

The 8,849 visits of Springbrook enrollees to the health unit and specialty clinics compared with the 3,843 medical visits by Wade residents indicates the willingness of patients to seek medical advice and treatment when it is readily available and is of a quality to inspire confidence and satisfaction. Visits to physicians were not inconvenient because a visit was only an elevator ride away, and inclement weather or transportation problems were never a reason for missing an appointment. Fees were based on the ability to pay, so cost was not a deterrent. Compared with the control group in Wade, Springbrook patients spent less than one-third as much money for more than twice as much medical care.

Projection of the results of this evaluation to other elderly populations throughout the country must take into consideration their geographic location, socioeconomic status, and age. Similar comparative studies of groups who do not live in a metropolitan area or close to large medical centers may evoke observations which differ significantly from these.

Perhaps certain factors in this study are valid, and impressions and data obtained have general application to the health experiences of the aged population as a whole. Also, these data may have some bearing in planning when the questions arise about the needs of the aged and which medical care services they will use.

Results of this study suggest that the availability of a health unit is a factor in shortening hospital stays, but the services of the unit do not appear to have affected mortality in the time studied. Medical and paramedical personnel in attendance promoted psychological well-being for the patients, and the practical help and advice given by the unit's staff and community agencies cannot be measured in concrete terms. Perhaps health units can become a commonplace facility in housing developments for the elderly.

REFERENCE

(1) Epstein, B. D.: Medical care program for the elderly in a housing project. Public Health Rep 79: 1005–1014, November 1964.