

# Alternative Paths to Long-term Care: Nursing Home, Geriatric Day Hospital, Senior Center, and Domiciliary Care Options

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**Abstract:** This paper examines certain quality of life outcomes, as well as comparative costs of care, for selected types of persons entering three very distinct types of alternative service programs that address the long-term care needs of vulnerable elderly persons: nursing homes (NH), geriatric day hospitals (GDH), and senior center (SC) programs. For selected outcomes, based on secondary analysis of the data gathered in another study, it was possible to add to the comparison samples of similar types of persons entering small foster-type domiciliary care homes (DC).

From pools of persons entering these programs, six separate sets of comparison samples who were similar at baseline were constructed (GDH-SC, NH-SC, NH-GDH, NH-DC, SC-DC, GDH-DC). Only

analyses pertaining to institutionalization and costs were conducted for the last three sets of comparison groups. Except for the issue of institutionalization, quality of life impact analysis showed only a few more post-test differences than would be expected by chance (although the few post-test differences that were observed in each case favored less restrictive settings). This more general similarity of outcome is indeed provocative, suggesting that in many ways the applicants adapted similarly to these quite distinct programs. Cost analyses found that nursing home and geriatric day hospital care, the two most restrictive settings, were also the two most expensive interventions. (*Am J Public Health* 1986; 76:38-44.)

## Introduction

From both humanitarian and cost containment perspectives, long-term care for elderly persons suffering from chronic diseases has become a significant societal problem. The need to understand the effects both on quality of life and costs for alternative service paths is central to developing effective options in long-term care.

Our research was based on the premise that, to varying degrees, different long-term care interventions serve overlapping types of vulnerable elderly persons. Support for this assumption is found in recent projections indicating that about three-fourths of the people who could pass the criteria for admission to an intermediate care facility (ICF) or skilled nursing facility (SNF) level nursing home are living in a community setting.<sup>1</sup> It was further assumed that, to some degree, this difference is a function of the availability of the various services rather than a rational process. Thus, while distinctiveness on an aggregate basis is to be expected among the populations served by any modality, there is a potential for overlap in the types of people found in these settings. We report here on the experience of common subgroups found in these different service programs. It is important to emphasize that, since our study groups pertain only to special segments of those served, our results cannot be construed as an assessment of the comparative impact on the overall populations served by these service programs.

Based on discussions and written communications with Eleanor Cain, Director, and other professional staff of Delaware's Division on Aging, Department of Health and Social Services, cooperating in this study, a number of quality of life outcomes were identified as goals of one or more of Delaware's elderly service programs under study: Senior Centers, Geriatric Day Hospitals, and Intermediate Care Nursing Homes. These goals are: improving community integration and feelings of well-being (broadly defined to include formal activities, informal social contacts, friendship, and reducing

loneliness); improving skills promoting independent living, and minimizing time spent in an institutional setting. The assessment of relative differences in total program cost was another goal.

For the latter two goals, based on secondary analysis of data gathered in another study,<sup>2,3</sup> it was possible to compare similar types of people who used these three options with those who chose yet another option—the unique Pennsylvania Domiciliary Care Program. Bias introduced as a result of two different geographic locations can be considered minimal since the overall population of the six Pennsylvania counties did not differ from the population of Delaware.

## Senior Center Programs (SC)

The senior center programs from which individuals were selected were found throughout the State of Delaware. The size of these programs ranged from 10-12 daily participants to well over 175 participants. These programs were multi-faceted in nature, but the range and extent of their activities were related to their size. All of the senior centers had, as a nucleus, a nutritional program that provided a snack in the morning, and a hot meal at mid-day. In addition, most programs offered such activities as crafts, social events, exercise, health screening, and excursions. Through participation in center activities, individuals received information about other available programs and services, and learned that the senior center provided information and referral. Transportation to and from the center was usually provided, and some centers offered additional transportation to medical appointments and shopping centers. For regular users of the program, the center offered an informal monitoring service, following up on those who did not appear when expected. Advocacy counseling was the most time intensive service delivered by the senior centers.

## Geriatric Day Hospitals (GDH)

While offering many of the same services as senior centers, geriatric day hospitals are designed for individuals who, because of physical or mental impairments, require support or supervision during the day. The Delaware Division of Aging supports one such hospital in each of the State's three counties with Title III and Title XX funds. The majority of sample members were drawn from these programs. The remainder came from two smaller facilities, one of which was

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privately owned and independent, the other operated by a nursing home.

Like the senior centers, the geriatric day hospitals offered counseling, as well as transportation, meals, recreational activities, information/referral, and monitoring services. However, these programs were supervised by a nurse or a social worker and provided a more complete assessment of each participant's needs. Based on this assessment, the program could provide medication monitoring, and/or arrange for various types of therapies. These programs emphasized maintenance or rehabilitation in accordance with the individual's potential.

#### **Intermediate Care Nursing Homes (NH)**

The intermediate care facilities in which sample members lived were located throughout the State of Delaware, and included private as well as state facilities. They ranged in size from relatively small (40 beds) to very large (525 beds). These facilities operated under the existing federal and state guidelines and regulations, and offered room and board, nursing care, therapies and activities. Based on data concerning daily activities of staff, personal care emerged as the most time intensive service in these facilities.

#### **Pennsylvania Domiciliary Care Program (DC)**

The Pennsylvania Domiciliary Care Program was designed to serve a target population consisting of Medicaid-eligible elderly, physically impaired younger adults, mental health and mental retardation clients. Approved domiciliary care facilities consist primarily of foster (one to three clients) homes in which personal care services, 24-hour supervision when necessary, and the normal range of meal, laundry, and other household services are offered by the proprietor. (Larger facilities housing four to 13 clients are also permitted and do exist, but they are rare, consisting (at least for the first years of program operation) almost exclusively of a number of group homes for mentally retarded/mental health clients.) The program features certification and monitoring of homes, placement and case management of clients, and a special state supplementation of SSI (supplementary security income) as a mechanism for financing costs of residency in the domiciliary care home. This program was conceived as an alternative to institutionalization.

#### **Methods**

For impact on community integration, outlook, and outcomes concerning skills, we compared three sets of matched samples:

- clients entering a geriatric day hospital program versus comparable clients entering a senior center (GDH-SC);
- clients entering nursing homes (Intermediate Care Facilities) versus comparable clients seeking care in senior centers (NH-SC);
- clients entering nursing homes versus comparable clients seeking care in a geriatric day hospital program (NH-GDH).

Three additional comparison groups were included for impact on institutionalization and costs:

- clients entering nursing homes versus comparable persons entering small foster-care type domiciliary care facilities (NH-DC);
- clients entering senior centers versus comparable people entering domiciliary care (SC-DC);
- clients entering geriatric day hospitals versus comparable persons entering domiciliary care (GDH-DC).

#### **Data Sources**

The primary method for data collection was direct interviewing. Potential sample members entering the four types of study programs were interviewed by clinically trained interviewers shortly before or on entry to each of these four programs. These interviews constituted the baseline or "pretest" data. About nine months later, those persons selected for inclusion in the final impact sample were reinterviewed, and these interviews provided a primary source of post-test data. Limited post-test proxy data were collected, primarily from family members, for those who had died or were too debilitated to respond. Information concerning use of services by study sample members, including days spent in non-community settings, both for the prospectively gathered data and the available data concerning the domiciliary care option, were collected by self-report or proxies at post-test. Independent agency record verification audits were conducted concerning hospital and institutional services for the majority of cases in Delaware and for questionable cases in Pennsylvania.

#### **Potential Sample Pools**

The goal of the sampling process was to obtain a pool of individuals who could be matched across the modalities. Potential study participants were drawn exclusively from new applicants to each program. From a clinical perspective, participants in the geriatric day hospital program represented the ideal type of individual with whom those from the other programs could be matched. Therefore, all GDH applicants were included in the potential sample pool.

Individuals recuperating from an operation, illness, or who need other forms of therapeutic intervention not appropriately provided outside of an institution, were screened out of the potential pool of NH sample members since they would not be generally matchable with individuals in the other service programs included in this study.

The screening procedure for senior center applicants was designed to select from the broader population entering these programs only those who need supportive services to remain at an acceptable level in the community.

Among the Pennsylvania domiciliary care clients, those age 62 or older who lived in the community when they applied to the program approximated the geriatric day hospital applicants, and only such persons were included in this study.

#### **Final Sample Construction**

Six sets of comparison samples (couplets) were constructed. The analytic procedure used to identify the comparable clients in each couplet, from within the two pools of potential sample members, is a recently developed and tested simulated random group assignment computer procedure—SIMRAN®. A more detailed description illustrating the SIMRAN procedure can be found in a paper evaluating the Pennsylvania Domiciliary Care Program on quality of life goals.<sup>2</sup> To be considered acceptable by the SIMRAN procedure, for each couplet of selected cases, there must be fewer significant pretest differences between the constructed groups than the average found in a series of randomly allocated sets of comparison groups modeled from the combined sample universe. This procedure identifies sample subgroups that are comparable, although not identical, on a large array of variables. The possibility exists that other, unmeasured characteristics could be differentially distributed across the subgroups, factors that are unrelated to the extensive array of variables controlled in the SIMRAN

TABLE 1—SIMRAN<sup>o</sup> Constructed Study Samples

Sizes	Comparison Group Sets	Sample
Nursing Home vs Geriatric Day Hospital (NH-GDH)		NH = 49    GDH = 49
Died or too sick to respond by Post-test		1            5
Nursing Home vs Senior Center (NH-SC)		NH = 32    SC = 32
Died or too sick to respond by Post-test		0            1
Senior Center vs Geriatric Day Hospital (SC-GDH)		SC = 37    GDH = 37
Died or too sick to respond by Post-test		4            4
Nursing Home vs Domiciliary Care (NH-DC)*		NH = 31    DC = 31
Geriatric Day Hospital vs Domiciliary Care (GDH-DC)*		GDH = 24    DC = 24
Senior Center vs Domiciliary Care (SC-DC)*		SC = 35    DC = 35

\*No comparisons of outcomes involving these sets depend exclusively upon post-test interviews, and data were therefore available for total samples.

sample selection process. This possibility, while real, is no more or less likely than in other quasi-experimental evaluation strategies, and the reader should be sensitive to this possibility. At the same time, a wide variety of potentially confounding variables have been controlled. We are convinced that the SIMRAN procedure effectively rules out bias possibilities due to maldistribution of cases across the extensive array of variables that were actively controlled in the simulated random assignment process.

Primarily because of deterioration and mortality, there was some attrition in the number of clients able to respond to the post-test interview. Only individuals who were interviewed both at pretest and post-test were used in the impact analyses involving the two quality of life outcome goals derived from the study's prospectively gathered interviews (Table 1). While the groups are reduced somewhat, the comparison samples in each set met the impact sample acceptability criteria.

Table 2 depicts the average scores of the sample members (combining the two groups within each set) across sets with respect to selected demographic, health, and social characteristics.

#### Analytic Strategy: Impact Analysis

The presence or absence of differential quality of life (QL) outcomes, across each intermodality patient couplet, was assessed some nine months after the baseline (application) interview.

All QL scales had an alpha reliability of .50 or higher. Inter-rater reliabilities (using an analysis of variance formula) for all clinical assessment outcome variables were .85 or higher, with most over .90. The single item self-report quality of life outcome variables were among those used successfully in previous studies by the investigators.\*

Initially, the two samples within each of the couplets were evaluated as comparable across the overwhelming

majority of outcome variable premeasures. Statistical differences were within the range of what would have been expected by chance alone, and analysis of covariance procedures were used to evaluate the differential impact of the two programs. Under this procedure, post-test adjusted mean scores are compared, covarying only on the pretest measure of the outcome variable in question.

In addition, in light of relatively small sample sizes and the inherent possibility of a type two error, a more qualitative methodology was also employed for formulating hypotheses concerning possible differential QL effects. The alternative methodology can be defined as a controlled "counting" procedure, under which the adjusted post-test mean scores for the two subgroups in each couplet are compared. We have followed Cohen's<sup>4</sup> approach, basing the potential effect size on the magnitude of the difference in the mean scores when displayed in standard deviation differences. Cohen defines a "small effect" as one that is equal to or exceeds 20 per cent of the pooled standard deviation value; a "medium effect" would exceed 50 per cent of the standard deviation value. For this analysis, we have chosen a value midway between these two values, or 35 per cent of a standard deviation, as indicative of a possible meaningful difference, when the difference equals or exceeds this value, a "meaningful" potential effect will be hypothesized. For example, if the standard deviation (based on the pooled average at pretest) equals .49, a difference in the means at post-test of .17 or greater would be considered as indicative of a potential effect. This latter analysis concentrates on the number of outcome variables meeting this criterion, and the consistency with which more positive potential outcomes are localized in one of the two subgroups in a couplet.

The third quality of life goal, reducing time in an institutional setting, is addressed using analysis of variance comparison procedures for all six couplets; the attainment of the goal is assessed based on the proportion of time during the nine-month impact period that the clients (applicants) resided in the community as opposed to a long-term care institution.

#### Results

We describe the impact of the alternative paths on the three goals: 1) community integration and feeling of contentment; 2) utilization of skills for independent living; and 3) minimizing time spent in an institution. The first two goals were not distinct since satisfaction and mental health components are intertwined. Each variable, however, was considered only once.

#### Quality of Life Goals

As will be seen below, the comparison of the post-test adjusted means of the outcome variables found few post-test differences, little more than would be expected by chance. However, members of the comparison groups as a whole changed over time. Not surprisingly, perhaps, during the nine months between pretest and post-test, the combined NH-GDH group, which was among the most physically debilitated of all the comparison sets, tended to deteriorate in physical functioning, declining in ability to perform personal activities of daily living (PADL), instrumental activities of daily living (IADL), and ability to act independently. They went out less frequently, with fewer having a close confidante, and more feeling lonely. At the same time, they experienced an increase in satisfaction with activities and social contacts, as well as an improved relationship with informal care network and improved feelings about their

A number of the scales as well as single item variables are derived from larger instruments in the field, as for example, the Brief Psychiatric Rating Scale (BPRS),<sup>5</sup> and the Barthel Index<sup>6</sup>; a detailed description of measures consistently used and standardized (in part) by previous studies of the Department of Social Gerontological Research, Hebrew Rehabilitation Center for Aged in Boston (HRCA), their scoring, and relevant inter-judge and alpha reliabilities can be found in a report entitled "Standardized Scales Relating to the Physical Health, Social Contacts, and Mental Status of Long-term Care Populations." For the costs of duplication and mailing, this report is available from the authors at HRCA upon request.

TABLE 2—Pretest Sample Client Characteristics (mean scores) for Pretest Comparison Samples

Variables	Code	NH-GDH	NH-SC	SC-GDH	NH-DC	SC-DC	GDH-DC
Age	1 = under 65; 2 = 65-74; 3 = 75-84; 4 = 84+	2.76	2.66	2.22	2.82	2.10	2.63
Sex	1 = male; 2 = female	1.64	1.66	1.77	1.73	1.76	1.77
Race	0 = non-White; 1 = White	0.82	0.89	0.74	N/A	N/A	N/A
General health	1 = excellent; 2 = good; 3 = fair; 4 = poor	2.52	2.50	2.68	2.51	2.39	2.50
Diabetes	1 = yes; 2 = no	1.86	1.88	1.88	1.86	1.84	1.92
Hypertension	1 = yes; 2 = no	1.53	1.59	1.49	1.51	1.54	1.45
Blood problem	1 = yes; 2 = no	1.86	1.88	1.91	1.98	1.97	1.83
Heart problem	1 = yes; 2 = no	1.66	1.59	1.54	1.65	1.77	1.67
Personal adjustment	1 = good; 2 = mild problem; 3 = problem	1.93	1.92	1.89	1.97	1.99	2.08
Use walker	1 = yes; 2 = no	1.78	1.83	1.84	1.77	1.93	1.85
Functional health scale	1 = best-5 = worst	3.67	3.52	3.39	3.39	3.11	3.56
Problem in access to medical care	1 = yes; 2 = no	1.82	1.88	1.82	1.93	1.93	1.90
Days out of house/week	0 = none; 1 = 1 day; 2 = 2 days-7 = daily	3.47	3.30	4.27	3.03	4.12	3.38
Close confidante	1 = yes; 2 = no	1.18	1.14	1.27	1.18	1.15	1.10
Neighbors a problem	1 = yes; 2 = no	1.97	1.97	1.97	1.98	1.97	2.00

TABLE 3—Selected Differences\* between Post-test Covariance Adjusted Means\*\* in One or More Couplets and the 95% Confidence Intervals\*\*\* of the Difference

Variables	Code	Comparison Samples		
		GDH (N = 44) Minus NH (N = 48)	SC (N = 31) Minus NH (N = 32)	GDH (N = 33) Minus SC (N = 33)
<b>Goal 1</b>				
Average no. of days out of house	0 = no days 7 = every day	+1.80 (1.29, 2.31)	+3.34 (2.78, 3.90)	-0.64 (-1.22, -0.06)
Attends social or recreational activities with friends and/or neighbors	Four points: 1 = very often to 4 = never	-0.11 (-0.30, 0.08)	-0.78 (-1.08, -0.48)	+0.67 (0.41, 0.93)
Wants to participate in more activities	1 = Yes 2 = No	-0.10 (-0.17, -0.03)	-0.07 (-0.13, -0.01)	-0.17 (-0.25, -0.08)
<b>Goal 2</b>				
Attends social or recreational activities independently	Four points: 1 = very often to 4 = never	-0.48 (-0.69, -0.27)	-1.00 (-1.30, -0.70)	+0.80 (0.48, 1.12)
Problems with personal activities of daily living (PADL)	1 = problem 0 = no problem	-0.14 (-0.17, 0.11)	-0.17 (-0.21, 0.13)	+0.21 (0.19, 0.23)
Ability to perform activities of daily living (PADL)	Seven-item scale 0 = Best to 21 = Worst	-2.14 (-3.57, -0.71)	-2.78 (-3.99, -1.57)	+0.77 (-0.29, 1.83)
Limitation in normal activities	Three points: 1 = completely limited to 3 = not limited	+0.30 (0.16, 0.44)	+0.21 (0.07, 0.35)	-0.14 (-0.27, -0.01)
Assessment of performance of activities of daily living	1 = good 2 = severely impaired	-0.25 (-0.44, -0.06)	-0.46 (-0.65, -0.27)	+0.33 (0.14, 0.52)

\*p ≤ .05 for difference between means in one or more of the couplets for each variable.  
 \*\*Using pretest covariance adjustments of the dependent measures.  
 \*\*\*95% confidence intervals in parentheses.

money situation. In addition, the two groups improved from pretest to post-test in emotional health; they were less anxious, less hostile, and more secure about doing things for themselves.

As compared with the other two comparison sets, the NH-SC sample was a generally healthier sample; nevertheless, this entire sample also deteriorated in physical functioning over time, declining in personal and instrumental activities of daily living. They became more limited in activities and less able to do things independently. They showed no deterioration in community integration or feelings of contentment, and both groups showed less anxiety over time, as well as improvement in satisfaction with activities and social contacts.

The SC-GDH comparison sample also deteriorated in IADL and the ability to do things independently. They showed no deterioration in the areas of community integration and feelings of contentment, and they showed improve-

ment over time in feelings of security about doing things alone.

The next section summarizes the findings for each goal for each of the three sets of comparison subgroups as displayed in Table 3. The Table reproduces only results whose means differed at a t-test p value ≤ .05.

**Goal 1: Community Integration and Feelings of Contentment**

Of 13 measures, there were no differences between samples in any of the three sets of comparison groups for 10: five separate scales concerning desire to see friends more often; to increase contact with neighbors, friends and kin; loneliness; Zung satisfaction; attitude toward own aging, and single item measures concerning whether the respondent has a close confidante; desire for social contacts; financial situation; whether there are upsetting elements in social relationships; and whether there is a problem with the network of informal supporters.

*NH-GDH:* Of the 13 measures, the only substantial difference between the two groups was in the variable involving the number of days out, with GDH clients going out more often than NH clients.

*NH-SC:* The two substantial differences, both to the benefit of the senior center, involved having more days out of the house and attending social events with friends and neighbors.

*SC-GDH:* There were two substantial differences, the senior center group being more likely to go to events with friends and neighbors and less likely to want to participate in even more activities.

#### Goal 2: Promoting Utilization of Skills for Independent Living

Of 20 measures, there were no differences between samples in any of the sets of comparison groups for 15: eight scales concerning mobility; ability to perform IADL; Kahana Dependency Scale; Reality/Distortion; Withdrawal; Anxiety; Hostility; and Health—and seven single item measures, concerning clinical judgments of mental/emotional health; physical functioning other than PADL; physical health assessment; performance of activities of daily living assessment; personal adjustment assessment; number of days in past three months when sickness prevented normal activities; and insecurity about abilities to do things for self.

*NH-GDH:* Of the 20 measures pertaining to skills for independent living, there were two post-test differences, both to the benefit of the GDH group.

*NH-SC:* There were three differences between the groups, in each instance to the benefit of the senior center sample. One difference relates to the likelihood of attending recreational and social activities independently, the other two relate to the performance of activities of daily living.

*SC-GDH:* There were two differences between the two groups at post-test, both to the benefit of the senior centers. The SC group has fewer problems with personal activities of daily living and were more likely to go to activities independently.

#### Results of the Controlled Counting Procedure

As indicated earlier, we believe there is a need to go beyond the normal "significance-based" comparison. The samples are relatively small, and potential effects could be obscured (a type II error situation may exist). To test for this possibility, the mean scores of each set of samples were compared. If the scores were within 35 per cent of the pretest "pooled standard deviation" of one another, we assumed almost "identity" in the score distribution. If the means were more disparate, we assumed that a potentially meaningful difference might exist.

For goal one, community integration and feelings of contentment, even applying this more liberal approach, for two of the comparisons (NH vs GDH and SC vs GDH, only one potential difference was observed. For the NH vs SC comparisons, however, five of 13 variables (38 per cent) pass the quarter or greater than the pretest "pooled standard deviation" criterion. In this instance, there is no clear reason to hypothesize that one sample is any more likely than the other to have benefited from program exposure: the SC group appeared to have the more positive outcomes in three instances, the NH group in two instances. Thus, for all three couplets, there is no reason to hypothesize differential outcome in the area of community integration and feelings of well-being.

The provisional "counting based" findings for goal 2 (utilization of skills for independent living) are suggestive of

the potential benefits of receiving services in a less restrictive environment. Between 20 per cent and 45 per cent of the variables, depending upon the couplet, pass the criterion, providing reason for us to further evaluate whether there might be a consistent direction in these possible effects.

In all three comparison couplets, those in the less dependent service situation were more likely to have positive outcomes in utilizing skills for independent living—in four of four NH vs GDH comparisons that exceed the criterion value, six of seven NH vs SC comparisons, and eight of nine SC vs GDH comparisons. The data suggest that SC clients are more likely than comparable clients in either of the other two subgroups to be able to perform instrumental activities without difficulty. SC clients are also less likely than GDH clients to be withdrawn. The data also suggest that GDH clients can outperform NH clients in a number of these same functional areas, but not with respect to withdrawal.

At the same time, the data would suggest that there are no differences across these three couplets in the following skills or areas relative to promoting independent living: psychological dependency, overall mental/emotional health, reality orientation, hostility, anxiety, personal adjustment, stamina, and sick days.

#### Goal 3—Minimizing Time Spent in an Institutional Setting

Differential impact in this domain was analyzed for all six sets of comparison groups, using all of the subjects in the SIMRAN constructed samples (Table 1). Based on clinical assessments and the screening procedures, presumably all the persons in these samples who enter an ICF nursing home could have had their service needs attended to by an alternative program. While not all individuals entering nursing homes stay indefinitely,<sup>7</sup> substantial numbers of those entering such facilities, particularly ICFs, do stay for years, and many until they die. Therefore, even without testing, it can perhaps be assumed that the alternative programs will surpass the nursing home in achieving this goal. Answers to questions concerning differential impact among the three remaining alternatives are less obvious.

As expected, large differences were found in all of the comparisons involving nursing home study samples with those served by other programs (NH-GDH, NH-SC, NH-DC). However, no important difference in time spent in an institutional setting emerged between the study samples in any of the remaining sets of comparisons (SC-GDH, SC-DC, GDH-DC). Considering the experience of all the study groups in the six comparison samples, the following composite profile emerges: on average, nursing home applicants spent 80 per cent or more of their time in an institution; geriatric day hospital applicants spent about 16 per cent of their time in an institution; while both domiciliary care and senior center applicants spent 8 per cent of their time in an institutional setting (further details available on request to author).

#### Potential Cost Differences

A small proportion of the vulnerable elderly have been shown consistently to use high levels of service; many others use no service at all. Thus, the cost analysis is intended as a vehicle for formulating hypotheses concerning key differences in the cost of caring for comparable patients across service modalities. In light of the limited sample sizes, and the possibility for maldistributed outlier cases, we are applying a somewhat conservative 20 per cent standard to these data—if the provisional cost values differ by 20 per cent or more on the matched couplet, we would hypothesize that a meaningful difference might exist.

TABLE 4—Cost Profiles for Study Subsamples (in dollars)

	NH (based on an N of 48 in each group)	GDH	NH (based on an N of 32 in each group)	SC	SC (based on an N of 33 in each group)	GDH	NH (based on an N of 30 in each group)	DC	SC (based on an N of 35 in each group)	DC	GDH (based on an N of 24 in each group)	DC
Average placement cost*	\$10,091	\$7,915	\$10,279	\$5,890	\$5,738	\$6,079	\$11,054	\$5,339	\$7,489	\$5,634	\$7,299	\$5,830
Average cost of community services (\$)	88	4,192	403	1,838	1,766	4,667	105	3,165	1,805	3,254	4,495	3,036
Subtotal hours of informal care† (\$)	10,179	12,107	10,682	7,728	7,504	10,746	11,159	8,504	9,294	8,888	11,794	8,866
Average cost of informal care (\$)	138	1,584	80	1,740	1,566	1,848	187	24	2,038	77	2,439	93
Average total cost	\$10,317	\$13,691	\$10,762	\$9,468	\$9,070	\$12,594	\$11,346	\$8,528	\$11,332	\$8,965	\$14,233	\$8,959

\*Including the cost of community living.

†Including hours spent in the intervention (i.e., GDH, SC, and DC) setting.

The long-term care programs analyzed here vary in the extent to which they encompass the full cost of daily living and community support service use. Thus, the first step in this preliminary cost analysis was to inventory all pertinent resources used by clients in each modality, whether the service is provided by the modality, another program, or purchased by the client. Statistical adjustments were made to ensure that the utilization profiles reflect equal sample sizes and exposure periods. Service utilization was disaggregated into three categories: placement, formal community support services, and informal care. *Placement* reflects clients' use of acute hospital, nursing home, and chronic care hospital days; and days of community living. *Community support services* include counseling, meal preparation, homemaking, special transportation, personal care, medical care, nursing care, therapies, geriatric day hospital care, senior center care, and domiciliary care. *Informal care* includes meal preparation, homemaking, transportation, personal care, and nursing care.

Utilization profiles were converted into cost profiles by multiplying each type of placement and formal service by its modal third party reimbursement rate. The federal minimum wage was used to value the time of informal care providers. The cost of community living was estimated from Bureau of Labor Statistics data on an intermediate budget for a retired couple. In all cases, 1981 data were used to generate aggregate cost profiles. (A more detailed description of the cost methodology and cost analysis is available from the authors upon request.)

Table 4 presents cost profiles for each of the six sets of comparison samples. The data presented in the first three rows of this Table summarize costs other than informal care; row 4 reflects informal care; and row 5 presents an estimate of total cost of care (formal and informal services) and residency. From a total societal perspective, GDH care appears to be more expensive than any of the three remaining modalities. Excluding the attributed values of informal care yields similar results. Nursing home care appears to be more expensive than GDH care, when the attributed average placement cost is the only component considered. DC appears to be universally less expensive than SC, especially when attributed costs of informal care are considered.

#### Discussion

Except for the issue of institutionalization, and variables related to the restrictive lifestyle associated with institutional care, no overwhelming differential quality of life effects emerged for the nursing home, geriatric day hospital, and

senior center options when viewed after nine months of placement. The more qualitative analyses suggest that there may be some differences in certain QL areas: clients served by less restrictive modalities appear to do better with skills that promote independent living.

At the same time, there are many areas where there do not appear to be differences, including the areas of satisfaction with life, personal adjustment, psychological dependency, reality orientation, anxiety and hostility. These findings suggest that the initially similar groups found in three Delaware long-term care service systems adapted similarly to these different programs. Whatever option they chose, they tended either to remain the same or deteriorate in a wide variety of adjustment and intra-psychological dimensions.

These findings point to the extensive adaptability of elderly persons. In terms of life satisfaction and other psychological variables, at least, elderly persons in long-term care institutions seem to do as well as similar persons served in community settings.

Since ours is a culture that values independence, institutionalization would be the option of choice only if it could be shown either to have important positive impacts on skills or other quality of life domains, or if institutionalization could be shown to be comparable in quality and yet less costly to society than other, less restrictive long-term care alternatives. In fact, the data presented suggest that both the nursing home and geriatric day hospital interventions, the two most restrictive settings, are more costly than the senior center and domiciliary care options.

It was not possible to compare the domiciliary care samples with common subgroups in the three Delaware options. Should quality of life outcomes be found to be similar when such comparisons are made, one might argue that policy makers should promote domiciliary care rather than senior centers for these target populations. Our findings from the previous study, comparing elderly community applicants to the Pennsylvania Domiciliary Care Program with similar persons in counties where the Program had not yet been initiated, revealed beneficial impact in a number of quality of life areas.<sup>2</sup>

Senior centers are primarily social organizations. Many of those who use these centers do not need care and do not fit the vulnerability criteria usually required for long-term care community-based services. Consequently, a policy that supported increased senior center care could lead to an expansion of resources that would be predominantly used by a non-vulnerable population group. Conversely, domiciliary care attracts a vulnerable population group, and expanded

resources of this type would be less likely to be used by non-vulnerable segments of the aged population.

On the other hand, senior centers do not require a restrictive living situation and serve a useful social purpose. They will continue to be established and utilized even in the absence of any efforts to avoid or minimize the use of long-term care institutional placements. Thus, adopting a marginal cost perspective, one may be able to "buy in" to this social program at relatively low cost and steer the vulnerable elderly to it. Domiciliary care is a less widespread intervention that would have to be newly established in many locations. Therefore, even though from a social cost perspective domiciliary care may appear to be a less expensive intervention, it may be more expensive from a marginal cost perspective.

It is important to recognize that the sample sizes generated for this study were relatively small. In such cases, very high utilization by a small number of individuals can have a profound effect on overall sample profiles.

One must further recognize that this study selected only particular segments of the applicants to each of the alternatives and thus should not be construed as a "complete" assessment of the four service programs; the findings should not be seen as suggesting the "final" word on the effectiveness of the *total* program efforts.

One final and important point should be made. While these elderly people were similar in many ways, there was one obvious difference. They did not choose the same long-term care alternative. The question of why vulnerable elderly choose one long-term care option over another has not yet been satisfactorily addressed. The assumption being made in this analysis is that, whatever the reasons for choosing alternative paths, these reasons are not related to quality of life outcome (other than institutionalization).

Factors such as knowledge and availability of certain long-term care options may enter into the decision. Or, in the case of a person forced to give up his/her house while hospitalized, a more restrictive residential setting may be the only possible choice. Whatever the motivations, once such a decision has been made, there is reason to believe that it is hard to divert the individual or his or her family from their choice. Indeed, there is some evidence for this hypothesis from the larger study which also investigated the decision-making process of the applicants and their families.<sup>8</sup>

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