DOCUMENT RESUME

ED 248 419 CG 017 691

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TITLE Adult Day Care: Its Impact on the Utilization of Other Health Care Services and on Quality of Life.
SPONS AGENCY Department of National Health and Welfare, Ottawa (Ontario).
PUB DATE Nov 83
GRANT NHRDD-6607-1261-43
NOTE 56p.; A version of this paper was presented at the Annual Scientific Meeting of the Gerontological Society (36th, San Francisco, CA, November 17-22, 1983).
PUB TYPE Reports - Research/Technical (143) -- Speeches/Conference Papers (150)

EDRS PRICE MF01/PC03 Plus Postage.
DESCRIPTORS *Adult Day Care; Community Involvement; Gerontology; *Health Services; Life Satisfaction; Longitudinal Studies; Older Adults; *Quality of Life
IDENTIFIERS Long Term Care; Manitoba (Winnipeg)

ABSTRACT

The Adult Day Care Program (ADC) in the Province of Manitoba is a health and social service program providing socialization and recreation in a supportive environment to those who, without this intervention, might deteriorate in physical or mental health function. To examine the impact of adult day care on the utilization of other health care services (including long-term institutionalization, physician visits, and hospital stays) and on quality of life (including survivorship, overall well-being, activity, and social integration), 76 randomly selected Winnipeg, Manitoba older adults were interviewed. Study participants were matched with those using no home care or home care other than ADC. Interviews were conducted in 1980 and again in 1982. Interview data contained standard demographic information, health information, and activity and social interaction information. An analysis of the results showed that the ADC, per se, was not having a unique effect on the utilization of medical claims services or inpatient hospital services. Rather, in both instances, the ADC participants tended to fall "between" the users of other home care services (the heaviest users) and the nonusers of home care services (the lightest users). Participation in the ADC resulted in a greater likelihood that the individual would be assessed for long-term institutional care and would be admitted to a personal care home. No significant differences emerged between the groups in terms of survival. Participation in ADC led to increased life satisfaction and increased participation in specific activities. Participation also led to increased social integration, a change not shared either by users of other home care services or nonusers. These findings suggest that ADC appears to be successful in fulfilling the objective of socialization. (BL)

ADULT DAY CARE: ITS IMPACT ON THE UTILIZATION OF OTHER HEALTH CARE SERVICES AND ON QUALITY OF LIFE

A version of this paper was presented at the Gerontological Society of America meetings, San Francisco, November, 1983.

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This study was funded by NHRDP of Health and Welfare Canada (#6607-1261-43). It was conducted while the first author was a National Health Scholar (#6607-1137-48).

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Executive Summary

Two previous studies have emanated from the Centre on Aging at the University of Manitoba studying the Adult Day Care Program in the Province of Manitoba. One of those was longitudinal in design and focused on the first participants of the province-wide program. The second was restricted to Manitoba Health Services Commission data, but examined many more participants after the program had been in existence for awhile. This report presents the findings from a third study which is in fact a continuation of the first one reported.

This study includes the Winnipeg participants of the first Adult Day Care study, that is, participants in Winnipeg Adult Day Care programs at the time the province-wide program was first begun. It was undertaken because of the novel opportunity to match those participants on age, sex, functional ability, and illness, with Winnipeg residents receiving other forms of home care but not Adult Day Care, and with another group of Winnipeg residents not receiving any form of home care. While the actual numbers of participants are small and refer to those participating in the program when it was first implemented, the opportunity for matched controls is relatively unique. It allows one to infer with greater confidence that the results are due to the Adult Day Care program rather than to age effects, sex differences, differences in functional ability, or illness effects.

This study, with the inclusion of the longitudinal interview data and the Health Services Commission data, allowed an assessment of the impact of the Adult Day Care program on those aged 65 and over participating in the program in terms of the utilization of other health services (including long-term

institutionalization, physician visits, and hospital stays). It also permitted an assessment of the impact of the Adult Day Care program on the elderly participants' quality of life (including survivorship, overall well-being, activity, and social integration).

Comparing the Adult Day Care participants with those living in the community, not receiving any home care services, allows an assessment of the impact of this particular program on the utilization of other health services. It does not, however, reveal if the impact is substantially different from that of other home care programs. The comparison of Adult Day Care participants with users of other home care services permits an assessment of whether or not its impact is similar to that of other services offered within the larger programs.

The total sample size for this study, from which subsamples permit relevant comparisons, totals 76. It is important to note that interviews at a second point in time do not exist for all of these individuals since some died during the time period in which the study was undertaken. These individuals are retained in the sample because survival or death is considered an "outcome" variable in later analyses.

Comparing the groups on selected sample characteristics, no age or sex differences between the groups emerge confirming that the matching was in fact conducted appropriately. There are, however, education, occupation, and ethnic differences between the Adult Day Care users and the non-users. Persons attending ADC are more likely to have less formal education, to have worked in semi-skilled occupations, not to have been housewives, and to claim allegiance to no particular ethnic group, than is true of the non-users. This is consistent with earlier findings that those attending Adult Day Care tend to have less formal education, to have worked in lower socioeconomic status

jobs, and that many of them claim no allegiance to a particular ethnic group. When comparing the ADC participants with the users of other home care services, similar but not identical results emerge. ADC participants are more likely than users of other home care services to have less formal education, to have worked in semi-skilled occupations, to claim no allegiance to any particular ethnic group, and to list their religion as something other than Protestant. The educational and occupational differences once again confirm findings reported in ADC - Phase I. There are no significant differences between the users of other home care services and the non-users on any of these dimensions, pointing to the distinctiveness of the ADC participants on the variables just noted.

The groups were compared first on their overall medical claims. Few differences emerged between the groups in terms of actual medical claims for the year prior to entering ADC or for two years after entrance, except that users of other home care services tend to have the greatest number of claims, significantly more than ADC participants in year after entry, and significantly more than non-users for each of the three years studied. This, it could be argued, is to be expected since they know what is available.

Medical claims were also examined by type of doctor, by type of visit, and by type of disease. It is clear that ADC participants and non-users do not differ significantly on any of the variables examined, suggesting no impact of the ADC program in this particular area for individuals of similar age, sex, functional ability, and illness. Furthermore, there are few differences arising between ADC participants and users of other home care services. Any instances where differences do arise, the users of other home care services tend to have more claims and to increase their claims more, and it occurs most notably when data are analyzed by morbidity code.

Most of the significant differences arise between the users of other home care services and the non-users in terms of both the number of services and the change in number of services. In most instances where significant differences emerge, the users of other home care services have more claims than the non-users and are more likely to have an increase in utilization. In other words, these data reveal users of other home care services as the heaviest users of medical claims services and the most likely to increase that usage. Remembering these individuals are matched on illness and functioning, the greater utilization cannot be explained on that basis. Nor do they tell us if it is good, bad, or simply appropriate in terms of some other factor, that they are the heaviest users. It could reflect a greater monitoring and referral from the varied services within home care, or it could reflect sufficient monitoring and attention at Adult Day Care which prevents these individuals from similar utilization.

In terms of the original question "How does the Adult Day Care program affect the utilization of such medical services, compared with non-users of similar age, sex, functional ability, and illness and how does it compare with users of other services within the home care system?", these data indicate that the ADC program is not leading to specific increased or decreased utilization. However, the differences emerging between the users of other home care services and the non-users suggest the ADC program can be viewed as in between these two extremes.

The groups were also compared on their hospital admissions. Inpatient hospital services were examined in terms of the number of admissions during the year prior to entry for ADC participants, first year after entry, second year after entry, and the change in the number of admissions from the year prior to entry to the first year after, to the second year after, and from the

first to the second year after entry. Similar computations were made for number of days stayed. All analyses take into account whether or not the stay included surgery or not. The findings for these data are relatively similar to those for medical claims. For number of hospital admissions and change in number of admissions, once again the ADC participants do not differ significantly from the non-users or from the users of other home care services.

All of the significant differences for admissions occur between the users of other home care services and the non-users, and in each case it is for number of admissions and not change in number of stays. Furthermore, in all instances the users of other home care services have more hospital admissions than do the non-users as a group.

Looking at the days stayed, ADC participants tend to have more days stayed during the second year after entry without surgery than do the non-users, the users of other home care services have more than the ADC participants for both the year prior and the second year after entry, and more than non-users for two of the three years studied in terms of both total days stayed and those stayed without surgery. That is, number of days stayed once again sees the users of other home care services having the greatest hospital utilization.

Change over time reveals few group differences but those that do appear are different from the foregoing. ADC participants are significantly more likely to increase the number of days stayed without surgery from the year prior to the second year after compared with non-users. The non-users are more likely to increase their days stayed from the first year after to the second year after, with surgery, compared with users of other home care services.

That is, ADC participants tend not to differ significantly from others of similar age, sex, functional ability, and illness in terms of inpatient hospital utilization. The few differences which do emerge reveal ADC participants more likely to increase days stayed when compared to non-users, but less likely to have as many days stayed as users of other home care services. Similar to the findings for medical claims, the main differences occur between the non-users and the users of other home care services. Again, participants of the ADC program seem to fall between these two other groups.

Unlike earlier findings (Chappell and Blandford, 1983), more of these participants show no change in their hospital utilization over time. Whether this is due to the small sample size and/or to the fact that this group refers to a time earlier in ADC's history is unknown.

Data from the personal care home files of the Manitoba Health Services Commission also permitted examination of long-term institutionalization. The data permitted examination of group differences in terms of original assessments taking place at time 1 and status at the end of the study only. Not one individual in the non-user sample was assessed or admitted. These data reveal that individuals living in the community, not receiving any home care services, but of similar age, sex, functional ability, and illness as those receiving home care services and those attending specifically ADC, are unlikely to become assessed for a personal care home. This suggests greater use of the system by those already in the system. Of those using the system, ADC participants are more likely to be assessed for, and to be admitted to, personal care homes than users of other home care services even though they are of similar age, sex, functional ability, and illness. That is, their greater tendency to be assessed and to be admitted cannot be accounted for in

terms of worse functioning or greater illness. Nor do they tend to be assessed as requiring greater care.

Another outcome measured in the study is survivorship, whether or not the individual is dead or still alive at the end of the study period. There are no significant differences between the groups on survivorship.

Adult Day Care has as one of its goals the provision of planned and supervised recreation and socialization. Indeed, it is the one program within home care in Manitoba which is designed with this as a major goal. Quality of life was measured here both subjectively and objectively. The former include measures of life satisfaction, perceptions of health, and economic security. Measures of the latter include social integration, activity level, and functional ability. Of the subjective measures, the Adult Day Care participants increased their life satisfaction, when compared with both of the other groups. Turning to the objective measures of quality of life, a similar "benefit" of the ADC program is shown in terms of increasing the participants' social integration when compared with both users of other home care services and with non-users. ADC participants also show increases in specific types of activities (indoor, outdoor, and church related) when compared with involvement in other home care program services and compared with non-users.

The major finding of this study is the strong evidence that participation in Adult Day Care does in fact leads to increased life satisfaction among its participants and to increased social integration and participation in specific activities. Adult Day Care, as the primary way in which the Manitoba home care program addresses socialization, appears to be successful in fulfilling this objective.

ADULT DAY CARE: ITS IMPACT ON THE UTILIZATION OF OTHER HEALTH CARE SERVICES AND ON QUALITY OF LIFE

Introduction

By definition, adult day care (ADC) is a health and social service program providing socialization and recreation in a supportive environment to those who, without this intervention, may deteriorate in physical or mental health function. ADC is intended to strengthen the individual's ability to function within his or her own home or community. It is designed for those persons living alone or with families. It also provides relief for the individual's family support system.

The program is not intended for persons whose needs can be met in a senior centre, for persons requiring the services of a medically supported day hospital, or whose needs can better be met through other services provided to them in their home by Home Care. It is intended for persons for whom attendance one or two days a week in an organized program is believed to maximize independent community living. At the present time the program is designed primarily as a community outreach service of Personal Care Homes although other sites are also considered.

The objectives of ADC include:

- The provision of planned and supervised recreation and socialization in a supportive environment to those who without this intervention would deteriorate in physical and mental health functioning.
- The provision of relief to the family and community support system allowing the individual to be maintained in his/her home.
- The prevention of premature institutionalization caused by the unnecessary deterioration of physical and mental functioning.
- The minimization of the incidence and severity of emotional and physical disability caused by social isolation.
- The early detection and assessment of illness.

- The reduction of the service gaps in the present care system.
- The utilization of an existing resource (personal care homes).

While some ADC programs existed in the province prior to 1979, it was fiscal year 1979/80 when the province-wide program began. Responsibility for the implementation of the program is shared by the Manitoba Health Services Commission (M.H.S.C.) and the Office of Continuing Care.

The current study evaluates various aspects of the ADC program by matching long-term ADC participants in the Winnipeg area with a group using home care services but not ADC and with a group using no home care services of any kind. All groups are matched on age, sex, functional disability, and illness so that results should not be attributable to differential age, sex, illness or functional ability. This increases confidence that the results are in fact reflecting program effects. However, other possible factors such as social support were not used for matching. However, some data are available from the interviews on this dimension and are incorporated into the multivariate analyses. The objectives of the study can be summarized as follows:

- To assess the impact of the ADC program on the elderly (age 65 and over) participants' utilization of other health services (including long-term institutionalization, physician visits, and hospital stays).
- To assess the impact of the ADC program on the elderly participants' quality of life (including survivorship, overall well-being, activity, and social integration).

Present State of Knowledge

We are currently witnessing a North American trend towards implementing alternatives to long-term institutional care for the elderly (Brody, 1980; Streib, 1980; Chappell, 1983). The introduction of alternative forms of home care, which are frequently considered less expensive than long-term

institutionalization (Hurtada et al., 1972; Morris and Harris, 1972; Lalonde, 1974; Weiner et al., 1978:199), has coincided with a period of economic constraint in both Canada and the United States. However, the proponents of non-institutional services argue for more than a fiscal advantage. Many argue that the appropriate utilization of home care will enhance the elderly's probability for living independently and reduce the need for their hospitalization or nursing home placement (Noelker and Harel, 1978; Spasoff et al., 1978). Support for this argument comes from the assessment of a significant minority of current institutional residents as capable of functioning at home with the support of home health services (see for example Kahn et al., 1977; Dulude, 1978). Such alternative services, in other words, are viewed as filling the existing gap between the extremes of hospital and nursing home care on the one hand and conventional housing with very little or no support on the other (Heumann, 1978).

The trend toward more home care services is also consistent with the prevailing view in the gerontological literature that long-term institutionalization is undesirable (Clark and Collishaw, 1975). Notwithstanding the contrary view held by some such as the proponents of the welfare model (Myles, 1978), the gerontological literature abounds with the assumption that institutions are detrimental for the elderly, except for a minority who require such total care. This assumption is tied intimately to the belief that independence is desirable and that institutions restrict autonomy while encouraging dependence. Wolk and Telleen (1976:95) claim that a necessary component for satisfaction in the later years is "an environment which at minimum offers the potential for personal autonomy ..." (also see Lopata, 1973; Stephens, 1975; Chappell and Penning, 1979).

Sentiment seems to favour the trend toward increasing the availability of diverse types of community support for the elderly, but there is by no means consensus. Some policy makers fear community programs will destroy family responsibility, although there is no evidence to support this claim (Biaggi, 1980; Kane and Kane, 1980). Studies examining the impact of various forms of home care are much more difficult to find. We do not know if participation in such forms of care in fact prolongs the elderly's stay in the community or prevents long-term institutionalization altogether; nor do we know if it helps to prevent decreases in well-being or contributes to increased well-being. Does monitoring on the part of staff at any one program lead to increased utilization of other services either through referral or increased knowledge of the system by the individual?

This issue is further confounded by the debate on utilization of health services and need. Much literature exists, demonstrating that utilization of the formal health and social service system is not necessarily based on need. The debate, however, on the extent to which those in need receive the required services is ongoing (Riley and Foner, 1968; Shanas and Maddox, 1976; Rosenstock, 1966; Cleary et al., 1982; Snider, 1981). Factors related to utilization, other than need, that have been identified include sex, health beliefs, socio-economic status, knowledge of the service, accessibility, among others.

The literature evaluating service programs is well summarized by Kelman:

> In point of fact - relative to the degree of ferment and questioning about the types, range, and quality of care and needed policy and programmatic developments and numbers of new, supposed innovative service experiments and demonstrations - the output of evaluative research has been miniscule indeed. If one imposes the additional criterion of research rigor relating to controlled studies, the resulting pool of research is diminished even further (1980:505).

This lack of rigorous evaluation research has been attributed to the difficulty in designing research capable of assessing the questions raised by policy makers (Rossi and Wright, 1977). This, however, does not obviate the need for outcome studies (Weissert, 1976).

One of the few rigorous evaluations of such a program is that reported by Weissert and associates (1980). This is an evaluation of a Day Hospital demonstration project conducted in the United States. Their design includes persons randomly assigned to an experimental and a control group to assess the impact of the program on various outcome measures including: functional disability, survivorship, and institutionaliziation. After control variables were introduced they conclude that the benefits of such a program were questionable. (See Home Health Care Services Quarterly, vol. 1, no. 3, 1980, for critiques of this study.)

The evaluation of day hospitals in Alberta (Flathman and Larsen, 1976) conducted a few years ago, however, reports improvements in patients' health status (physical, mental and social) as a result of the day hospital program. These investigators were unable to obtain either a true experimental or a matched control group so were forced to restrict their study to a time-series quasi-experimental approach with observations of patients at three times during the course of treatment and subsequently. The task of disentangling possible age and illness effects, given such a sample, especially when studying an elderly population, are well-known (Botwinick, 1982).

The current study offers an evaluation of adult day care, using matched controls. While this strategy can be problematic if the matched controls are not randomly distributed, the current study permits an assessment of this as a confounding factor. The collection of demographic and social data (see

following section) allow an empirical test of the randomness of the groups. As elaborated below, such a test confirmed the randomness of the groups.

Design of the Study and Description of the Data

The design is longitudinal, incorporating matched controls. Participants in the three provincially funded ADC programs in Winnipeg at the time of the study are matched with two control groups. They are matched with persons not attending ADC but users of other home care services and with a second group of elderly persons living in the community and not using ADC or any other home care services. All persons are matched on age, sex, functional disability, and illness.

The matches are accomplished through an initial merging of data from two existing studies: Adult Day Care - Phase I, funded by the M.H.S.C., is a longitudinal study of all ADC participants in provincially funded programs during the first three months of 1980. All individuals were interviewed at minimum at the start of the study and one year later or when they left the program, whichever came first (N = 127). Health service utilization data were obtained for each of these individuals from the M.H.S.C.

The second study, the Peer and Intergenerational Support Network Study, was funded by the Social Sciences and Humanities Research Council of Canada. That study involved a random sample of 400 individuals aged 65 and over in the Winnipeg area, living in the community, receiving no home care services and a random sample of 400 individuals aged 65 and over in the Winnipeg area, living in the community and receiving some form of home care other than ADC. All 800 individuals were interviewed once.

That is, one study includes virtually all participants of provincially funded ADC programs. The other study includes a representative sample of those aged 65 and over, in Winnipeg, using home care other than ADC services

as well as a representative sample of those aged 65 and over, in Winnipeg, receiving no formal home care services and living in the community (not in long-term institutional care). By taking the ADC participants aged 65 and over, located in programs in Winnipeg, it is possible to match these individuals with those receiving other home care services and those not receiving any home care services, on three of the variables noted above (age, sex, and functional disability). The M.H.S.C. "claims" data is then used to match on illness. (See below for a discussion.) Matching on these factors, gives relative confidence that significant differences emerging between the groups in the utilization of medical services, in-patient hospital services, long-term institutional care, or various quality of life measures are program effects rather than group differences in age, sex, functional disability, or illness. That is, by matching on these factors one "controls" for their confounding effects.

Comparing the ADC participants with those living in the community, not receiving any home care services, allows an assessment of the impact of this particular program on the utilization of other health services. It does not, however, reveal if the impact is substantially different from that of other home care programs. The comparison of ADC participants with users of other home care services permits an assessment of whether or not its impact is similar to that of other services offered within the larger program.

All of the respondents in the current study had been interviewed in the winter/summer of 1980 for their inclusion in the original studies. Many of the interview questions are identical in each of the studies. They were then reinterviewed in the spring and early summer of 1982 for the current study. Interview data contain standard demographic information, health information, and data referring to activity and social interaction.

Health utilization data from the M.H.S.C. (which dispenses payments for the provincial health insurance scheme) were obtained in three areas: medical utilization, in-patient hospital utilization, and personal care home data for all respondents, coinciding with the year prior to entry of the ADC participant into that program and for two full years after entry into that program. The medical utilization data contain the total number of such claims, the number of claims by specialty of doctor visited, the number of claims by type of visit (tariff code), and the number of claims by disease category (morbidity code). In-patient hospital utilization data refer to the total number of admissions, the total number of days stayed, and each of these with and without surgery.

Data from the personal care home file contain the original assessment date and level of care, origir ' admission date if admitted and level of care.

ADC participants are matched with the two groups of individuals noted above, first on age, sex and functional disability, since this information was readily available. Age is coded in years. Respondents are matched accordingly. Functional disability is measured using activities of daily living and included items common to both of the original studies. Items referred to assistance required with: using the telephone, shopping, preparing meals, household tasks, finances, dressing/undressing, feeding/eating, and bathing. The internal consistency coefficient (Cronbach's alpha) for the total sample for all items equals .80. These items are summed, then collapsed into three categories: low (good functioning), medium (able to function with little help), and high (unable to do alone).

Matching on illness takes into account both the total number of medical claims for year 1 (corresponding to the year prior to entry of the ADC participants) and the total number of hospital admissions. Severity is taken

into account in the latter by examining whether or not the hospital admissions are with or without surgery. The individual from the home care user sample and the nonuser sample that most closely match the ADC participant is then selected. Categories for the morbidity codes are not used in the matching because they tend to represent parts of the body rather than severity or consequence of the illness (see Greenlick et al., 1968 for a discussion).

There were initially 34 ADC participants in Winnipeg. Four refused to sign consent forms releasing their claims data from the M.H.S.C. All but one of the remaining 30 are matched on age, sex, functional disability, and illness from the home care user sample. Only 18 of the original 30 ADC participants could be matched with the non-user sample, not surprising given the greater functional ability of the latter. That is, the total sample of ADC participants and non-users equals 36, with 18 from each group. Because the data permit, comparisons between the home care users and non-users are also reported.

That is, the total sample size from which subsamples permit the relevant comparisons, totals 76. It is important to note that interviews at a second point in time do not exist for all of these individuals, since some died during the time period in which the study was undertaken. These individuals are retained in the sample because survival (or death) is considered an "outcome" variable in later analyses. (See Table 1.)

Analyses include frequencies, cross-tabulations, and t-tests. Because the groups are matched on age, sex, functional ability, and illness, it is not necessary to control for these factors. The design itself controls for them.

Table 1
Sample Size

A) ADC Participants and Users of Other Home Care Services

	ADC		Home Care	
	N	%	N	%
two interviews	19	66	18	62
first interview only, death	7	24	9	31
first interview only, illness	3	10	2	7
	29	100	29	100

B) ADC Participants and Non-Users

	ADC		Non-Users	
	N	%	N	%
two interviews	11	61	13	72
first interview only, death	5	28	3	17
first interview only, illness	2	11	2	11
	18	100	18	100

Sample Characteristics

Selected characteristics for the sample as a whole (N = 76) are shown in Table 2. These refer to characteristics at the time of the first interview. Over a third (38%) are less than 75 with slightly more (41%) between 75 and 84 years of age. Less than a quarter (21%) are 85 or older. Fully two-thirds (67%) are female, one-third (33%) male. Over 80% of the individuals are either married (41%) or widowed (46%). Almost two-thirds (61%) had worked in semi-skilled occupations and less than one-third (27%) had been housewives. Most (81%) attained more than four years formal education, but more than half (60%) had less than grade 9. Over three-quarters of the sample (84%) spoke English as their first language and fully half (49%) named no ethnic group. Similarly, almost half (45%) were born in Canada and just under one-half (48%) said their religion was Protestant. Fully 89% of the sample had lived in Winnipeg for more than 20 years. In other words, the sample is noticeably Canadian and long-time Winnipeggers.

Group comparisons are made on each of these characteristics. Considering first the ADC users compared with nonusers, there are no significant age or sex differences between the groups, confirming that the matching was conducted appropriately. There are however, education, occupation, and ethnic differences. Persons attending ADC are more likely to have less formal education (less than nine years, gamma = .77), to have worked in semi-skilled occupations (gamma = .67), not to have been housewives (gamma = .73), and to claim allegiance to no particular ethnic group (gamma = .80) than is true of the nonusers. This is consistent with earlier findings (see final report ADC - Phase I) that those attending ADC tend to have less formal education and to have worked in lower socio-economic status jobs, and that many of them claim no allegiance to a particular ethnic group. The nonusers on the other hand

Table 2
Selected Sample Characteristics

	N	%
Age		
65 - 74	29	38
75 - 84	31	41
≥ 85	16	21
	76	100
Sex		
male	25	33
female	51	67
	76	100
Marital Status		
single/separated/divorced	10	13
married	31	41
widowed	35	46
	76	100
Major Occupation		
semi-skilled	46	61
housewife	20	27
other	9	12
	75	100
Education in Years		
0 - 4	14	19
5 - 8	30	41
≥ 9	29	40
	73	100
Language Spoken Best		
English	63	84
other	12	16
	75	100
Ethnicity		
no group	37	49
a group	39	51
	76	100
Place of Birth		
Canada	34	45
other	42	55
	76	100
Religion		
Protestant	36	48
Catholic	23	31
other	16	21
	75	100
Length of Time in Winnipeg		
< 20 years	8	11
≥ 20 years	66	89
	74	100

tend to have more formal education, to have worked in higher level socio-economic jobs or have been housewives, and to claim allegiance to an ethnic group.

When comparing the ADC participants with users of other home care services, similar but not identical results are revealed. The ADC participants are more likely than users of other home care services to have had less formal education (gamma = .59), to have worked in semi-skilled occupations (gamma = .55), to claim no allegiance to any particular ethnic group (gamma = .52), and to list their religion as something other than Protestant (gamma = .49). Users of other home care services, on the other hand, tend to have more formal education, to have worked in occupations other than semi-skilled, to claim allegiance to an ethnic group, and to list their religion as Protestant. The educational and occupational differences once again confirm findings reported in ADC - Phase I.

There are no significant differences between the users of other home care services and the nonusers on any of these dimensions, pointing to the distinctiveness of the ADC participants on the variables just noted.

Medical Claims

Some, but little existing research focuses specifically on medical claims data for the types of comparisons being made here. Nevertheless, Brown and Watson (1980) identify some of the demographic, social and economic factors affecting the use of health care services by older people. They report increased physician utilization with age and by females compared with males. It will be recalled that both age and sex are matched in the current study so that such confounding variables will not affect the results reported here. Wan and Odell (1981) examine the use of health and social services among the non-institutionalized elderly according to a predisposing, enabling, and need

variable categorization. They generally conclude that need for service is the most important in physician utilization but that knowledge of service is the most important factor in the use of social services. This could reflect the recency of social service programs for the elderly.

Medical claims data used here refer to the number of services in the year prior to entry for the ADC participant, first year after entry, and second year after entry; change in number of services for each of these years; change by type of doctor, type of visit, and disease category. Since number of claims in the year prior is part of the illness variable used for matching, this should be taken into account in interpreting the data. However, since it is only one of three aspects taken into account, groups could differ. It is therefore shown here. The data are shown in Table 3. Data are presented in terms of the percentage of the group having claims in each of the years, the mean number of claims per group, and changes in number of claims over time.

Comparing first the ADC participants with the nonusers, no significant differences emerge between these two groups on any of these variables. The ADC participants differ significantly from users of other home care services only in terms of the number of services being received in the first year after entry. As a group, users have on average 31.1 medical claims while the ADC participants have 21.1. Otherwise the differences between these two groups are not significant. There are, however, significant differences between users of other home care services and nonusers. For each of the three years examined, users of other home care services have significantly more medical claims than the nonusers. The groups do not differ significantly however in the average amount of change in their medical claims. (Change scores shown in the table refer to incremental change. The lack of group differences at $time_1$ suggests no confounding effect of the starting point on the change score. In

Table 3

Utilization of Medical Services

A) ADC Participants and Nonusers

		ADC		Nonusers	
(i)	Total Services Received	%	$\bar{x}$	%	$\bar{x}$
	Year prior to entry	94	14.6	83	11.8
	1st year after entry	94	20.8	89	18.9
	2nd year after entry	89	23.1	89	20.1
	(ns)				

		$\bar{x}$ Change	$\bar{x}$ Change
(ii)	Change in Services Received		
	Year prior to 1st year after	6.2	7.1
	Year prior to 2nd year after	8.4	8.3
	1st year to 2nd year after	2.2	1.2
	(ns)		

B) ADC Participants and Users of Other Home Care Services

		ADC		Other Home Care	
(i)	Total Services Received	%	$\bar{x}$	%	$\bar{x}$
	Year prior to entry	97	19.2	100	24.6
	1st year after entry *	97	21.1	100	31.1
	2nd year after entry	93	26.6	100	36.1
	(ns)				
	* $t = 2.23$; $p < .05$				

		$\bar{x}$ Change	$\bar{x}$ Change
(ii)	Change in Services Received		
	Year prior to 1st year after	1.9	6.5
	Year prior to 2nd year after	7.3	11.5
	1st year to 2nd year after	5.4	5.0
	(ns)		

C) Users of Other Home Cares Services and Nonusers

		Other Home Care		Nonusers	
(i)	Total Services Received	%	$\bar{x}$	%	$\bar{x}$
	Year prior to entry *	100	24.6	83	11.8
	1st year after entry **	100	31.1	89	18.9
	2nd year after entry ***	100	36.1	89	20.1
	* $t = 3.06$; $p < .01$				
	** $t = 2.90$; $p < .01$				
	*** $t = 2.20$; $p < .05$				

		$\bar{x}$ Change	$\bar{x}$ Change
(ii)	Change in Services Received		
	Year prior to entry	6.5	7.1
	1st year after entry	11.5	8.3
	2nd year after entry	5.0	1.2
	(ns)		

those instances where there are significant group differences at $time_1$, scores for relative change are also computed. The results, however, are similar.)

In other words, few differences emerge between the groups in terms of actual medical claims in any of the three years or change in medical claims over that time period, except that users of other home care services tend to have the greatest number of claims, significantly more than ADC participants in year after entry and significantly more than nonusers for each of the three years studied. This, it could be argued, is to be expected since they know what is available. Recall that all groups are matched on age, sex, functional ability, and illness.

Utilization of medical services is also analyzed by type of doctor visited: attending and consulting physician; clinical teaching physician; other fee for service physician; diagnostic services; chiropractor; optometrist; and dentist, for the year prior to entry, the first year after entry, and the second year after entry, as well as change from year prior to first year after entry, from year prior to second year after entry, and from first to second year after entry.

There are no significant differences between the ADC participants and nonusers. There are no significant differences between the ADC participants and users of home care services on any of these indicators, except one. The users of other home care services have more visits to an attending and consulting physician in the year coinciding with the first year after entry, than do the ADC participants ($\bar{x}$ = 13.6 and 21.1 for the ADC participants and users of other home care services respectively. $t = 2.27$; $p < .05$).

Differences between the users of other home care services and nonusers do emerge. Users of other home care services have more claims for attending and consulting physician in the year prior to entry and in the first year after

entry (year prior $\bar{x}$ = 15.8 vs 7.7, t = 2.80; $p < .01$; first year after: $\bar{x}$ = 21.1 vs 11.2, t = 3.45, $p < .001$) and have more visits to the clinical teaching physician for the second year after entry ($\bar{x}$ = .6 vs .1, t = 2.00, $p < .05$) than is true of the nonusers. In terms of change in utilization, no differences in the medical claims data emerge between the groups when studied by type of doctor visited.

Where significant differences occur in the category attending and consulting physician, this category is examined further by bloc of practice codes. These include: internal medicine; surgery (including anesthesia, radiology, and pathology); psychiatry; ear, nose, and throat, dermatology; pediatrics, obstetrics, and gynaecology; physical medicine; and general practice.

These additional analyses reveal that the greater tendency of users of other home care services to have claims to attending and consulting physicians when compared with the ADC participants for the year coinciding with the first year after entry is accounted for by more visits to a general practitioner ($\bar{x}$ = 9.6 and 5.2, t = 2.17, $p < .05$). Significant differences between these two groups do not emerge for any of the other bloc of practice codes.

Differences between users of other home care services and nonusers in terms of claims to attending and consulting physicians is due to differences in claims specifically for internal medicine in the year prior to entry ($\bar{x}$ = 3.7 vs .7, t = 2.54, $p < .05$) and for claims to the general practitioner in the second year after entry ($\bar{x}$ = 11.3 vs 6.1, t = 2.17, $p < .05$). In both instances, users of other home care services tend to have more claims than do nonusers. No group differences emerge when change scores are examined.

Similarly, the data are analyzed by type of visit: consultations, office visits, hospital visits, special call, major surgery, minor surgery, surgical

assistance, obstetric services, anesthesia, diagnostic radiology, laboratory services, other diagnostic therapeutic services, and miscellaneous services. Again, analyses are performed for each of the three years and for change from year prior to first year after entry, for year prior to second year after entry, and for change from first to second year. There are no claims for the surgical assistance and obstetric services categories. Analyses therefore do not include these two categories.

There are no significant differences between the ADC participants and nonusers in any of these comparisons. Two significant differences emerge between the ADC participants and users of other home care services. ADC participants tend to have fewer claims for an office visit in the first year after entry ($\bar{x}$ = 7.9 vs 11.6, t = 2.10, $p < .05$), and fewer claims for special calls in the first year after entry ($\bar{x}$ = .1 vs 1.3, t = 2.49, $p < .05$), than do users of other home care services. In terms of change in use of services by type of visit, users of other home care services were more likely to increase their visits from year prior to first year after entry for special calls ($\bar{x}$ = 1.1 vs .1, t = 2.22, $p < .05$) and for other diagnostic and therapeutic services ($\bar{x}$ = .9 vs -.3, t = 2.20, $p < .05$) than do the ADC participants.

There are more differences between users of other home care services and nonusers, in the actual use of services by type of claim. The former are more likely to have more claims for office visits in all three years ($\bar{x}$ = 9.8 vs 5.2, t = 2.57, $p < .01$; $\bar{x}$ = 11.6 vs 6.6, t = 2.90, $p < .01$; $\bar{x}$ = 10.9 vs 6.7, t = 1.98, $p < .05$ for each year respectively) and for other diagnostic and therapeutic services in the year prior to entry and the second year after entry ($\bar{x}$ = 1.6 vs .4, t = 3.02, $p < .01$; $\bar{x}$ = 3.4 vs 1.2, t = 2.60, $p < .01$ for each year respectively) than is true of the nonusers. Users of other home

care services are also more likely to have more claims for hospital visits in both the first and second year after entry ($\bar{x}$ = 2.0 vs .4, t = 2.34, p < .05; $\bar{x}$ = 5.3 vs .5, t = 2.67, p < .01 respectively) than do the nonusers.

The former are also more likely to increase their claims for hospital visit from year prior to first year after and from first year after to second year after ($\bar{x}$ = 3.4 vs .3, t = 2.27, p < .05; $\bar{x}$ = 3.3 vs .1, t = 2.14, p < .05) when examining change in utilization by type of visit.

The data are also analyzed by type of disease: endocrine, nutritional, metabolic diseases and immunity disorders; diseases of the blood and blood forming organs; mental disorders; diseases of the circulatory system; diseases of the respiratory system; diseases of the skin and subcutaneous tissue; diseases of the musculoskeletal system and connective tissue; symptoms, signs and ill-defined conditions; injury and poisoning; diseases of the nervous system and sense organs; diseases of the digestive system; diseases of the genitourinary system; 'any not specified above'; and no disease code recorded. Once again, analyses are performed for each of the three years and for change.

Only one significant difference emerges between the ADC participants and nonusers in any of these comparisons. ADC participants tend to have more claims for the 'any not specified above' category in the year prior to entry than do the nonusers ($\bar{x}$ = 2.1 vs .4, t = -2.09, p < .05).

There are more differences between ADC participants and users of other home care services. Users of other home care services are more likely to have more claims in both the year prior to entry and the first year after entry for diseases of the digestive system (year prior: $\bar{x}$ = 2.1 vs .1, t = 2.26, p < .05; first year after: $\bar{x}$ = 1.5 vs .5, t = 2.04, p < .05) than do ADC participants. Users of home care services also have more claims in the year prior to entry for diseases of the respiratory system ($\bar{x}$ = 1.2 vs .1, t =

2.79, $p < .01$), diseases of the circulatory system ($\bar{x} = 7.6$ vs 3.2, $t = 2.24$, $p < .05$), and diseases of the skin and subcutaneous tissue ($\bar{x} = 1.1$ vs .1, $t = 2.23$, $p < .05$) than is true of the ADC participants.

However, in the second year after entry, ADC participants are more likely to have more claims for mental disorders ($\bar{x} = 3.3$ vs .4, $t = -2.06$, $p < .05$) than users of other home care services.

In terms of change in use of services, users of other home care services are more likely to increase their visits from year prior to first year after and from year prior to second year after for diseases of the nervous system and sense organs than the ADC participants ($\bar{x} = .4$ vs -1.6, $t = 2.64$, $p < .01$; $\bar{x} = .7$ vs -1.8, $t = 2.38$, $p < .05$).

When comparing users of other home care services to nonusers; the former are more likely to have claims for diseases of the skin and subcutaneous tissue both in the year prior to entry and in the first year after entry (year prior: $\bar{x} = .8$ vs .1, $t = 2.51$, $p < .05$; first year after: $\bar{x} = 1.1$ vs .1, $t = 2.44$, $p < .05$). They also tend to have more claims for the 'any not specified above' category in the year prior to entry ($\bar{x} = 3.6$ vs .4, $t = 2.90$, $p < .01$); for injury and poisoning in the first year after entry ($\bar{x} = 1.2$ vs .1, $t = 2.26$, $p < .05$); and for diseases of the nervous system and sense organs in the second year after entry ($\bar{x} = 2.0$ vs .6, $t = 2.09$, $p < .05$) than is true of the nonusers.

In terms of change in utilization, users of other home care services tend to increase their number of visits from the year prior to the first year after entry for injury and poisoning ($\bar{x} = .8$ vs -1.1, $t = 2.15$, $p < .05$) more than do the nonusers. However, it is the nonusers who increase their number of visits for diseases of the digestive system ($\bar{x} = 1.7$ vs $-.7$, $t = -1.99$, $p <$

.05) from the year prior to first year after entry than do the users of other home care services.

That is, when the medical claims data are analyzed by morbidity code, the users of home care services again emerge as the heaviest utilizers.

The data for differences between the groups in the medical claims data are summarized in Table 4. It is clear that ADC participants and nonusers do not differ significantly on any of the variables examined, suggesting no impact of the ADC program in this particular area, for individuals of similar age, sex, functioning ability, and illness. Furthermore, there are few differences arising between the ADC participants and users of other home care services. In the instances where differences do arise, the users of other home care services tend to have more claims or to increase their claims more and it occurs most notably when data are analyzed by morbidity code.

Most of the significant differences arise between the users of other home care services and the nonusers, in terms of both the number of services and the change in number of services. In most instances where significant differences emerge, the users of other home care services have more claims than the nonusers or are more likely to have an increase in utilization. In other words, these data reveal users of other home care services as the heaviest users of medical claims services and the most likely to increase that usage. Remembering these individuals are matched on illness and functioning, the greater utilization cannot be explained on that basis. Nor do they tell us if it is "good", "bad", or simply "appropriate" in terms of some other factor, that they are the heaviest users. It could reflect a greater monitoring and referral from the various services within home care or it could reflect sufficient monitoring and attention at ADC which prevents these individuals from similar utilization.

Table 4

Summary of Differences between Groups in Medical Services

	ADC & Nonusers	ADC & Home Care	Home Care & Nonusers
# of medical services	-	1st yr. after (HC)*	yr. prior (HC) 1st yr. after (HC) 2nd yr. after (HC)
Change in # of medical	-	-	-
# of medical services by type of doctor	-	1st yr. after, attending & consulting physician (HC)	yr. prior, attending & consulting physician (HC) 1st yr. after, attending & consulting physician (HC) 2nd yr. after, clinical teaching physician (HC)
Change in # of medical services, by type of doctor	-	-	-
# of visits to attending and consulting physician by bloc of practice	-	1st yr. after, general practice (HC)	year prior, internal medicine (HC) 2nd yr. after, general practice (HC)
Change in # of visits to attending and consulting physician by bloc of practice	-	-	-
# of medical services by type of visit	-	1st yr. after, office visits (HC) 1st yr. after, special call (HC)	yr. prior, office visitis (HC) 1st yr. after, office visits (HC) 2nd yr. after, office visits (HC) yr. prior, other diagnostic/therapeutic services (HC) 2nd yr. after, other diagnostic/therapeutic services (HC)

Table 4 (cont'd)

	ADC & Nonusers	ADC & Home Care	Home Care & Nonusers
# of medical services by type of visit (cont'd)			1st yr. after, hospital visits (HC)
			2nd yr. after, hospital visits (HC)
Change in # of medical services by type of visit	-	yr. prior to 1st yr. after, special call (HC)	yr. prior to 2nd yr. after, hospital visits (HC)
		yr. prior to 1st yr. after, other diagnostic/therapeutic services (HC)	1st yr. after to 2nd yr. after, hospital visits (HC)
# of claims by type of disease	yr. prior, any not specified (ADC)	yr. prior, respiratory (HC)	yr. prior, skin (HC)
		yr. prior, digestive (HC)	yr. prior, any not specified (HC)
		1st yr. after, circulatory (HC)	1st yr. after, skin (HC)
		1st yr. after, skin (HC)	1st. yr. after, injury, poisoning (HC)
		1st yr. after, digestive (HC)	2nd yr. after, nervous (HC)
		2nd yr. after, mental disorders (ADC)	
Change in # by type of visit	-	yr. prior to 1st yr. after, nervous (HC)	yr. prior to 1st yr. after, injury and poisoning (HC)
		yr. prior to 2nd yr. after, nervous (HC)	yr. prior to 1st yr. after, digestive (NON)

* Note: Initials in brackets indicate the group receiving more services or more likely to increase their utilization, where ADC - ADC, Home Care - HC, Nonusers - NON.

In terms of the original question, how does the ADC program affect the utilization of such medical services, compared with nonusers of similar age, sex, functioning ability, and illness and how does it compare with other services within the home care system, these data indicate that the ADC program is not leading to specific increased or decreased utilization. The program per se is not having an effect on such utilization, neither an increase nor decrease. However, the differences emerging between the users of other home care services and the nonusers suggest the ADC program can be viewed as in-between these two "extremes". That is, the users of other home care services use more than the ADC participants but not enough to show a significant difference, the ADC participants use more than the nonusers, but not enough to show a significant difference. However, the users of other home care services and the nonusers are far enough apart in terms of utilization for their differences to emerge as significant.

Hospital Admissions

In a general sense, reduced hospital admissions could be considered a desirable goal. Indeed, some evidence suggests some community programs lead to fewer days stayed in hospital. For example, Nielson, et al (1972) studied recipients of an organized program of home aide services on patients discharged from a geriatric rehabilitation hospital and reported reduced days stayed in hospital as an outcome when using matched controls. This is not necessarily inconsistent with Wan and Odell's (1981) finding that need was more important in hospital service utilization than knowledge of the service or various enabling or predisposing factors. In general though, the relationship between participation in ADC and utilization of in-patient hospital services is largely unknown. A separate study, Adult Day Care and Change in the Utilization of Medical and In-patient Hospital Services,

longitudinal in nature but not including control groups (Chappell and Blandford, 1983), shows dramatic decreases in hospital admissions over time among ADC participants. The data in the current study inform us whether or not this is a situation unique to ADC participants.

The utilization of in-patient hospital services is discussed here in terms of the number of admissions during the year prior to entry for the ADC participants, the first year after entry and the second year after entry; the change in the number of admissions from the year prior to entry to the first year after, to the second year after, and from the first year to the second year after entry; the number of days stayed and the change in the number of days stayed for the same time periods. All analyses are also conducted in terms of whether or not the stay includes surgery. It should be noted here that both the number of admissions and whether or not the hospital admission includes surgery are the other two components of the illness variable used for matching. They are discussed here because they comprise only a component of that variable. Nevertheless, their role as a component of the variable used for matching can act to minimize group differences.

Looking first at the comparisons between the ADC participants and the nonusers, no significant differences emerge in terms of number of admissions or changes in the number of admissions. There is however, one difference emerging when looking at the number of days stayed: ADC participants tend to have more days stayed in hospital during the second year after entry, without surgery, than is true for the nonuser ($\bar{x}$ = 1.7 vs 0.0, t = -2.20, $p < .05$). In terms of change in the number of days stayed, one difference again emerges: ADC participants are more likely to increase the number of days stayed from the year prior to the second year after entry while the nonusers are more

likely to decrease their days stayed in hospital, without surgery only. ($\bar{x}$ = 1.4 vs -.6, t = 2.02, $p < .05$)

Comparing the ADC participants with users of other home care services, we find no significant differences between the groups in terms of number of admissions or changes in the number of admissions. Turning to the number of days stayed, ADC participants tend to have fewer days without surgery in the year prior to entry and in the second year after entry when compared with users of other home care services ($\bar{x}$ = .66 vs 9.3, t = 2.35, $p < .05$; $\bar{x}$ = 1.6 vs 19.6, t = 2.03, $p < .05$) for each of these years respectively). No other differences emerged for number of days stayed. No significant differences emerge for change in days stayed.

Consistent with findings for the medical claims data reported earlier, there are substantially more differences between the users of other home care services and nonusers. Users of other home care services are likely to have more hospital admissions for all three years studied than are the nonusers, when totals are examined ($\bar{x}$ = .66 vs .11, t = 2.41, $p < .05$; $\bar{x}$ = 1.0 vs .39, t = 2.13, $p < .05$; $\bar{x}$ = .97 vs .17, t = 2.95, $p < .01$ for each year respectively). Users of other home care services also are more likely to have more admissions without surgery in the year prior and the second year after ($\bar{x}$ = .44 vs .06, t = 2.21, $p < .05$; $\bar{x}$ = .66 vs .0, t = 2.25, $p < .05$). The groups do not differ significantly in terms of number of admissions with surgery. Nor are there differences in change in number of admissions.

Looking at number of days stayed, there are again no differences involving surgery. The users of other home care services, however, tend to have more days stayed in total, and without surgery for the first year of the study ($\bar{x}$ = 13.8 vs 2.1, t = 2.05, $p < .05$; $\bar{x}$ = 9.3 vs .56, t = 2.36, $p < .05$ respectively). They also tend to have more days stayed in total during the

first year after entry ($\bar{x}$ = 17.9 vs 5.4, t = 2.32, $p < .05$), and more days stayed without surgery in the second year after entry ($\bar{x}$ = 19.6 vs 0.0, t = 2.22, $p < .05$). There is only one significant difference in change in number of days stayed. Users of other home care services tend to decrease their days stayed in hospital with surgery from first year after to second year after while nonusers are more likely to increase days stayed with surgery during this time period ($\bar{x}$ = -6.59 vs 2.56, t = -2.07, $p < .05$).

These results are summarized in Table 5. While the pattern is not as consistent as it is for the medical claims data, it nevertheless supports those findings. For number of hospital admissions and change in number of admissions, once again, the ADC participants do not differ significantly from the nonusers or from the users of other home care services.

All of the significant differences for admissions occur between the users of other home care services and the nonusers and in each case it is for number of admissions and not change in number of stays. Furthermore, in all instances the users of other home care services have more hospital admissions than do the nonusers as a group.

Looking next at the number of days stayed, ADC participants tend to have more days stayed during the second year after entry, without surgery than do the nonusers, the users of other home care services have more than the ADC participants for both the year prior and the second year after entry, and more than nonusers for two of the three years studied in terms of both total days stayed and those stayed without surgery. That is, number of days stayed once again sees the users of other home care services, having the greatest hospital utilization.

The change scores reveal few group differences, those that do appear are different from the foregoing. ADC participants are significantly more likely

Table 5

Summary of Differences between Groups
in In-patient Hospital Utilization

	ADC & Nonuser	ADC & Home Care	Home Care & Nonusers
# of stays	-	-	yr. prior, total (HC) 1st yr. after, total (HC) 2nd yr. after, total (HC) yr. prior, without surgery (HC) 2nd yr. after, without surgery (HC)
Change in # of stays	-	-	-
# of days stayed	2nd yr. after, without surgery (ADC)	yr. prior, without surgery (HC) 2nd yr. after, without surgery (HC)	yr. prior, total (HC) 1st yr. after, total (HC) yr. prior, without surgery (HC) 2nd yr. after, without surgery (HC)
Change in # of days stayed	yr. prior to 2nd yr. after, without surgery (ADC)	-	1st yr. after to 2nd yr. after, with surgery (NON)

Note: See note at bottom of Table 4.

to increase the number of days stayed, without surgery, from the year prior to the second year after, compared with the nonusers. The nonusers are more likely to increase their days stayed from the first year after to the second year after, with surgery, compared with users of other home care services.

That is, ADC participants tend not to differ significantly from others of similar age, sex, functioning ability, and illness in terms of in-patient hospital utilization. The few differences which do emerge, reveal ADC participants more likely to increase days stayed when compared to nonusers but less likely to have as many days stayed as users of other home care services. Similar to the findings for medical claims, the main differences occur between the nonusers and the users of other home care services, again participants of the ADC program seem to fall between users of other home care services, and the non-users.

Unlike earlier findings (Chappell and Blandford, 1983), more of these participants show no change in their hospital utilization over time. Whether this is due to the small sample size and/or to the fact that this group refers to a time earlier in ADC's history is unknown. That is, the reasons for these differences are unknown.

Institutionalization

An explicit goal of the ADC program is the prevention and/or postponement of long-term institutional care (Rapelje, 1980; Rhodes, 1982). Data regarding the effect of the program in this regard are largely unavailable. Flatham and Larsen's (1976) study of day hospitals in Edmonton, Alberta fail to show evidence that this program prevented or retarded long-term institutional care. However, Nielsen et al's matched comparisons of those in an organized program of home aide services for patients discharged from a geriatric rehabilitation

hospital show that those receiving the service are significantly less likely to be admitted to long-stay institutions.

Data to assess this outcome come from the personal care home files from the MHSC. Data in this study contain only the original assessment for personal care homes and information for those actually admitted. Change in level of assessment was not obtained. The data do permit an examination of group differences in terms of original assessments taking place in $time_1$ and status at the end of the study.

Not one individual in the nonuser sample is assessed or admitted. Therefore, group comparisons reveal these individuals as much more likely not to have been assessed or admitted when compared with the ADC participants and when compared with the users of other home care services. This finding is discussed further after a presentation of the differences between the ADC participants and users of other home care services.

Comparing the ADC participants and users of other home care services, Table 6 shows that the latter are most likely not to have been assessed at all, individuals in both groups are just as likely to have been assessed at $time_1$ and the ADC participants are more likely to have been assessed after entry into the program. At the end of the study, ADC participants are more likely to have been assessed and admitted to a personal care home. Among those assessed, however, there is no significant difference in the level of care assessed and among those admitted there is no significant difference in the level of care to which they are admitted.

Remembering that the groups are matched, these data reveal that individuals living in the community, not receiving any home care services, but of similar age, sex, functioning ability, and illness as those receiving home care services and those attending specifically ADC, are unlikely to become

Table 6

Long-term Institutionalization

	ADC		Other Home Care	
A) Original Assessment	N	%	N	%
Not assessed	12	41	21	72
Assessed, year prior	5	17	5	17
Assessed, after entry	12	41	3	10
	29	99	29	99
$t = -2.88$; $p < .01$				
B) Institutional Status at End of Study				
Not assessed/not admitted	12	41	20	69
Assessed/not admitted	5	17	4	14
Assessed/admitted	12	41	5	17
	29	99	29	100
$t = -2.30$; $p < .05$				
C) Among those Assessed, Level of Care Assessed				
Minimal care	7	41	4	44
Average care	8	47	4	44
Above average/intense care	2	12	1	11
	17	101	9	99
(ns)				
D) Among those Admitted, Level of Care Admitted To				
Minimal	5	42	2	40
Average/above average care	6	50	3	60
Respite care	1	8	0	0
	12	100	5	100
(ns)				

assessed for a personal care home. This suggests greater use of the system by those already in the system. Of those using the system, ADC participants are more likely to be assessed for and to be admitted to personal care homes than users of other home care services, even though they are of similar age, sex, functioning ability, and illness. That is, their greater tendency to be assessed and to be admitted cannot be accounted for in terms of worse functioning or greater illness. Nor, as noted above, do they tend to be assessed as requiring greater care.

Survivorship

One of the outcomes measured in the study is survivorship, i.e., whether the individual is dead or still alive at the end of the study period. Nielsen and associates' study of the home aide service for patients discharged from a geriatric rehabilitation hospital finds no significant differences in survival. While in some senses, being still alive can be considered the preferable outcome, nevertheless an argument can be made that in old age, given certain disabilities and illnesses, it might not be the preferred status. Either way, the groups are compared and as shown in Table 7, there are no significant differences between ADC participants and nonusers, ADC participants and users of other home care services, or between nonusers and users of other home care services. That is, the data reveal no significant differences between the groups for survivorship.

Quality of Life

ADC has as one of its goals, the provision of planned and supervised recreation and socialization, and the minimization of the incidence and severity of emotional and physical disability caused by social isolation. It is not unreasonable to translate these goals into a concern with the quality

Table 7

Survivorship

Status at end of study	ADC N	ADC %	Other Home Care N	Other Home Care %
Living	22	76	21	72
Dead	7	24	8	28
	29	100	29	100

(ns)

Status at end of study	ADC N	ADC %	Nonuser N	Nonuser %
Living	13	72	15	83
Dead	5	28	3	17
	18	100	18	100

(ns)

Status at end of study	Other Home Care N	Other Home Care %	Nonuser N	Nonuser %
Living	21	72	15	83
Dead	8	28	3	17
	29	100	18	100

(ns)

of life of the participants. In this study quality of life is measured with both subjective and objective measures: life satisfaction, perceptions of health, and economic security; social integration, activity level, and functional ability. All of these measures come from the interview data. The analyses reported here refer to group comparisons at time of the first interview and the time of the second interview, a period two years apart. Change scores from $time_1$ to $time_2$ are also analyzed. In some instances, the sample size is reduced since some individuals are not interviewed at $time_2$ due to death or illness.

Quality of life indicators, especially life satisfaction and morale are major foci within the gerontological literature (Chappell and Havens, 1980; Kozma and Stones, 1978; Larson, 1978). The effect of programs on quality of life, however, is more often assumed than validated through rigorous research designs. Nevertheless, existing research on program effectiveness suggests this may be one area of particular effectiveness of community programs. The first phase of the ADC evaluation (Chappell, 1982) points to subjective indicators of quality of life, particularly life satisfaction, as an area in which many of the ADC participants are showing improvements. Similarly, Nielson and associates' (1972) study of home aide services for patients discharged from a geriatric rehabilitation hospital reports significant and favourable effects on contentment among arthritis or fracture patients receiving the service. Weiler and associates' (1976) comparison of adult day care participants with a group of community living elderly reports no significant differences between the groups in satisfaction with life styles but does report improvement among the ADC participants in the areas of emotional functioning and interpersonal relationships.

Looking first at subjective measures of quality of life, Table 8 shows the results for life satisfaction. At $time_1$ the ADC participants show significantly lower life satisfaction than do the nonusers. By $time_2$ however, the ADC participants have increased their life satisfaction while the nonusers have worsened. The ADC participants at this time have improved sufficiently that there is no longer a significant difference between the two groups. The change scores also show no significant differences between the groups. In other words, these results confirm the findings reported earlier (see Chappell, 1982), showing increased satisfaction among ADC participants. These data reveal that those increases bring their level of satisfaction, as a group, up to that of the nonusers.

Comparing the ADC participants with users of other home care services, ADC participants as a group are significantly lower on life satisfaction than users of other home care services, again at $time_1$. By $time_2$ they have improved while the users of other home care services have decreased their satisfaction such that there are no longer significant differences between the two groups. Their change scores are significantly different from one another.

Comparing users of other home care services with nonusers, the groups start out at $time_1$ approximately the same. By $time_2$ however, the users of other home care services have decreased sufficiently that they are significantly worse in terms of life satisfaction than is true of the nonusers. There is no significant difference in the change scores.

The ADC participants do not differ significantly from the nonusers or the users of other home care services for the perceived health variable. The users of other home care services differ significantly from nonusers at $time_1$ and $time_2$. At $time_1$ they have significantly worse perceptions of their health ($\bar{x}$ = 3.1 vs 2.5, $t = 2.38$, $p < .05$). There is virtually no change two years

Table 8

Life Satisfaction

(means)	ADC	Nonuser	ADC	Other Home Care	Other Home Care	Nonuser
$time_1$	9.9	12.9	8.8	11.6	11.6	12.9
	$t = 2.53$, $p < .01$		$t = 2.49$, $p < .01$		(ns)	
$time_2$	11.4	12.7	9.7	9.4	9.4	12.7
	(ns)		(ns)		$t = -2.13$, $p < .05$	
change ($time_1$ to $time_2$)	.44	-1.15	.25	-2.55	-2.55	-1.15
	(ns)		$t = -2.12$, $p < .05$		(ns)	

later and the difference remains ($\bar{x}$ = 3.2 vs 2.3, t = 2.63, p < .01). None of the groups differ significantly from one another on their subjective feeling of economic security.

That is, the ADC program leads to increased life satisfaction among its participants, an effect contrary to that evident among users of other home care services who are not attending ADC.

Leaving the subjective measures of quality of life, results for social integration are shown in Table 9. The index of overall social integration shows significant differences between the ADC participants and nonusers, with the former less socially integrated at $time_1$, increasing significantly by $time_2$, but still significantly less socially integrated at that time than the nonusers. Looking at the specific items, the overall trend is confirmed although differences do emerge within specific categories. The number of relatives more or less follows this trend although there are no significant group differences at $time_2$. In terms of the persons seen for specific purposes, the ADC participants start out with fewer than the nonusers but their instrumental contacts increase significantly while those of the nonusers decrease so that by $time_2$ they have significantly more of such people in their lives.

The trends are identical when comparing the ADC participants with users of other home care services, except that, for people seen for specific purposes, the ADC participants improve to the point at $time_2$ where there are no longer significant differences with the users of other home care services, rather than surpassing this group.

Unlike the health service utilization data, the quality of life indicators do not reveal major differences between the users of other home care services and nonusers. In fact, these two groups do not differ

Table 9

Social Integration

		ADC	Nonuser	ADC	Other Home Care	Other Home Care	Nonuser
Social Integration Index	1)*	6.3	9.3	6.4	8.5	(ns)	
		t = 6.27, p < .001		t = 5.39, p < .001			
	2)**	7.3	8.2	7.2	8.2	(ns)	
		t = 2.06, p < .05		t = 3.17, p < .01			
	3)***	1.2	-1.3	1.1	-.6	(ns)	
		t = -4.23, p < .001		t = -3.72, p < .001			
# in Household	1)	(ns)		(ns)		(ns)	
	2)	(ns)		(ns)		(ns)	
	3)	(ns)		(ns)		(ns)	
# of Relatives	1)	3.2	12.6	2.8	8.0	(ns)	
		t = 2.75, p < .01		t = 4.63, p < .001			
	2)	(ns)		(ns)		(ns)	
	3)	3.45	-7.1	3.5	-1.7	(ns)	
		t = -2.58, p < .05		t = -2.99, p < .01			
# People Seen for Specific Purposes	1)	.9	3.7	1.0	3.6	(ns)	
		t = 3.96, p < .01		t = 4.38, p < .001			
	2)	3.9	1.3	(ns)		2.8	1.3
		t = -2.62, p < .01				t = 2.12, p < .05	
	3)	3.4	-2.85	3.5	-1.2	(ns)	
		t = -4.86, p < .001		t = -3.93, p < .001			
# of Friends	1)	.3	4.1	.6	2.9	(ns)	
		t = 5.85, p < .001		t = 3.50, p < .01			
	2)	1.5	6.7	1.2	3.1	(ns)	
		t = 2.81, p < .01		t = 2.07, p < .05			
	3)	(ns)		(ns)		(ns)	
# of Siblings Seen	1)	2.7	1.3	(ns)		(ns)	
		t = -2.43, p < .05					
	2)	(ns)		(ns)		(ns)	
	3)	(ns)		(ns)		(ns)	
# of Children Seen	1)	(ns)		(ns)		(ns)	
	2)	(ns)		(ns)		(ns)	
	3)	(ns)		(ns)		(ns)	
Frequency Contacted Relatives	1)	(ns)		(ns)		(ns)	
	2)	(ns)		(ns)		(ns)	
	3)	(ns)		(ns)		(ns)	
Frequency Contacted Friends	1)	1.4	5.7	2.0	4.2	4.2	5.7
		t = 6.01, p < .001		t = 2.96, p < .01		t = -2.82, p < .01	
	2)	1.8	4.4	(ns)		(ns)	
		t = 3.57, p < .01					
	3)	(ns)		(ns)		(ns)	
Frequency Contacted Neighbours	1)	(ns)		(ns)		(ns)	
	2)	(ns)		(ns)		(ns)	
	3)	(ns)		(ns)		(ns)	

* $time_1$
** $time_2$
*** Change from $time_1$ to $time_2$

significantly on the overall index nor on any of the single items except two: the users of other home care services see significantly more individuals for specific purposes than do the nonusers (at $time_2$, but not at $time_1$), , they have significantly fewer contacts with their friends than do the nonusers (at $time_1$, but not at $time_2$).

In sum, the ADC program shows a significant effect in terms of increasing the participants' social integration, when compared with both users of other home care services and with nonusers.

The activities index, however, reveals something quite different (see Table 10). None of the groups differ significantly from one another on the overall index, or on the single items referring to organized activities for all ages, organized activities for seniors only, or for community and volunteer activity. The users of other home care services do not differ significantly from the nonusers on any of the items.

However, ADC participants are significantly less involved in indoor activities at $time_1$ than either the nonusers or the users of other home care services. They increase significantly by $time_2$ while the other two groups decrease slightly such that there are no significant differences between the groups by $time_2$. Similarly, the ADC participants are significantly less involved in outdoor activities at $time_1$ but there is no difference by $time_2$. They are also significantly less involved in church related activities at $time_1$ than either of the other two groups. They change significantly by $time_2$ when compared with users of other home care services who tend to decrease their involvement such that these two groups are similar by $time_2$. By this time, however, they are still less involved in church related activities than are the nonusers.

Table 10

Activities

		ADC	Nonusers	ADC	Other Home Care	Other Home Care	Nonusers
Combined Activity Score	1)*		(ns)		(ns)		(ns)
	2)**		(ns)		(ns)		(ns)
	3)***		(ns)		(ns)		(ns)
Indoor Activities	1)	2.1	2.9	2.0	2.9		(ns)
		t = 4.95, p < .001		t = 6.21, p < .001			
	2)		(ns)		(ns)		(ns)
	3)	.6	-.1	.7	-.		(ns)
		t = -3.23, p < .01		t = -4.01, p < .001			
Outdoor Activities	1)	1.8	2.6	1.8	2.2		(ns)
		t = 3.27, p < .01		t = 2.41, p < .05			
	2)		(ns)		(ns)		(ns)
	3)		(ns)		(ns)		(ns)
Church Related	1)	1.2	2.1	1.3	1.6		(ns)
		t = 3.43, p < .01		t = 1.98, p < .05			
	2)	1.2	1.8		(ns)		(ns)
		t = 2.25, p < .05					
	3)		(ns)	.3	-.3		(ns)
				t = -2.48, p < .05			
Organized - All Ages	1)		(ns)		(ns)		(ns)
	2)		(ns)		(ns)		(ns)
	3)		(ns)		(ns)		(ns)
Organized - Seniors	1)		(ns)		(ns)		(ns)
	2)		(ns)		(ns)		(ns)
	3)		(ns)		(ns)		(ns)
Community/Volunteer	1)		(ns)		(ns)		(ns)
	2)		(ns)		(ns)		(ns)
	3)		(ns)		(ns)		(ns)

* $time_1$
** $time_2$
*** Change from $time_1$ to $time_2$

In sum, participation in ADC also seems to lead to increases in specific types of activities (indoor, outdoor, and church related), compared with involvement in other home care program services or compared with the nonusers.

Lastly, we turn to functional disability, a health measure which is also an indicator of quality of life. All groups, it will be recalled are matched on this variable. As a check, comparisons between groups are made for functioning at $time_1$. No between group differences emerge, confirming the matching is done correctly.

Table 11 presents the comparisons between the groups on functional disability at $time_2$, for the overall score and the individual items and in terms of change from $time_1$ to $time_2$. Most striking is the fact that only one significant difference appears between the ADC participants and users of other home care services. At $time_2$ the ADC participants are more likely to require help with bathing than is true of the users of other home care services. However, both the ADC participants and the users of other home care services have significantly worse functioning ability at $time_2$ than do the nonusers, that is, members of both groups deteriorate significantly over the two year period compared with the nonusers. This general trend is confirmed for all individual items except using the telephone, dressing and undressing, and feeding and eating. For these three items no significant group differences emerge. That is, participants of ADC and other home care programs deteriorate in functioning over time and more so than the nonusers. Recall that the groups were matched on functioning at $time_1$.

Conclusions

This study assesses the adult day care program, in Winnipeg, Manitoba, in terms of its impact on the utilization of other health services and on the participants' quality of life. To assess these aspects of the program,

Table 11

Functional Disability

		ADC	Nonusers	ADC	Other Home Care	Other Home Care	Nonusers
ADL	1)*	2.8	1.8		(ns)	2.7	1.8
		t = -3.55, p < .01				t = 3.85, p < .01	
	2)**	-.3	.1		(ns)	-.2	.1
		t = 3.65, p < .001				t = -3.17, p < .01	
Using Telephone	1)		(ns)		(ns)		(ns)
	2)		(ns)		(ns)		(ns)
Shopping	1)	1.9	1.4		(ns)	1.8	1.4
		t = -3.24, p < .01				t = 2.57, p < .05	
	2)	-.5	.4		(ns)		(ns)
		t = 3.68, p < .001					
Preparing Meals	1)	1.7	1.1		(ns)	1.5	1.1
		t = -3.52, p < .01				t = 2.20, p < .05	
	2)	-.4	.1		(ns)	-.3	.1
		t = 2.59, p < .05				t = -2.08, p < .05	
Housekeeping Tasks	1)	1.9	1.3		(ns)	$\bar{x}$ = 2.0	$\bar{x}$ = 1.3
		t = -3.82, p < .001				t = 6.50, p < .001	
	2)	-.4	.3		(ns)		(ns)
		t = 2.84, p < .01					
Managing Finances	1)	1.7	1.1		(ns)	$\bar{x}$ = 1.5	$\bar{x}$ = 1.1
		t = -3.52, p < .01				t = 2.20, p < .05	
	2)		(ns)		(ns)		(ns)
Dressing/Undressing	1)		(ns)		(ns)		(ns)
	2)		(ns)		(ns)		(ns)
Feeding/Eating	1)		(ns)		(ns)		(ns)
	2)		(ns)		(ns)		(ns)
Bathing	1)	1.8	1.3	1.9	1.6		(ns)
		t = -2.99, p < .01		t = -2.07, p < .05			
	2)	-.6	-.1		(ns)		(ns)
		t = 2.37, p < .05					

* $time_2$

** Change from $time_1$ to $time_2$

longitudinal data for matched samples is obtained and includes: interview data, medical claims data, hospital claims data, and data on personal care home admissions. Because the groups are matched on age, sex, functional disability and illness, the results should not be attributed to these factors.

- The results indicate that the adult day care program per se is not having a unique effect on the utilization of medical claims services or of in-patient hospital services. Rather, in both instances the adult day care participants tend to fall "between" the users of other home care services (the heaviest users) and the nonusers of home care services (the lightest users).

- Participation in the adult day care program results in a greater likelihood that the individual will be assessed for long-term institutional care and will be admitted to a personal care home. If a personal care home offers the most appropriate service, this could be considered desirable. Whether or not it represents premature admission cannot be determined from these data.

- No significant differences emerge between the groups in terms of survival.

- It is in terms of the quality of life measures where the effectiveness of adult day care emerges. Participation in adult day care leads to increased life satisfaction among its participants and increased participation in specific activities. It also leads to increased social integration for its participants, a change not shared by either users of other home care services or nonusers. ADC, as the primary way in which home care addresses socialization, appears to be successful in fulfilling this objective.

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