

# A Comparative Analysis of Costs to Government for Home Care and Long-term Residential Care Services, Standardized for Client Care Needs\*

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## RÉSUMÉ

L'article présente les résultats d'analyses de données administratives de la province de la Colombie-Britannique couvrant une décennie, de 1987-1988 à 1996-1997, dans le but de comparer les coûts pour le gouvernement des soins de longue durée, à domicile et en établissement d'hébergement. Les données administratives analysées couvrent une gamme de services de santé dont les soins hospitaliers, les soins médicaux, les médicaments et les soins de longue durée, à domicile et en établissement. Comme la province applique le même système de classification des niveaux de soins aux soins à domicile et aux soins en établissement d'hébergement, il a été possible de comparer ces soins entre eux des points de vue du coût et de l'utilisation. Étant donné que le type et le niveau de soins dispensés aux usagers changent grandement au fil du temps, les auteurs ont conçu une stratégie axée sur l'équivalent temps plein (ETP) pour garantir l'exactitude des comparaisons. En vertu des constatations, les soins à domicile en général constituent une option plus économique que les soins en établissement d'hébergement, en supposant que les besoins des usagers sont les mêmes. L'écart de coût entre les soins à domicile et les soins en établissement rétrécit beaucoup quand le type ou le niveau de soins change, et les soins à domicile sont plus coûteux que les soins de longue durée en établissement pour les usagers des soins à domicile qui décèdent. L'étude révèle que les soins à domicile sont une option plus économique que les soins de longue durée en établissement d'hébergement dans un système de soins intégrés qui englobe les deux types de services, pourvu que les services en établissement prennent le pas au moment voulu dans le cadre d'une planification rigoureuse.

## ABSTRACT

This paper reports on the results of analyses using administrative data from British Columbia for 10 years from fiscal 1987/1988 to 1996/1997, inclusive, to examine the comparative costs to government of long-term home care and residential care services. The analyses used administrative data for hospital care, physician care, drugs, and home care and residential long-term care. Direct comparisons for cost and utilization data were possible, as the same care-level classification system is used in BC for home care and residential care clients. Given significant changes in the type and/or level of care of clients over time, a full-time equivalent client strategy was used to maximize the accuracy of comparisons. The findings suggest that, in general, home care can be a lower-cost alternative to residential care for clients with similar care needs. The difference in costs between home care and residential care services narrows considerably for those who change their type and/or level of care, and home care was found to be more costly than long-term institutional care for home care clients who died. The findings from this study indicate that with the appropriate substitution for residential care services, in a planned and targeted manner, home care services can be a lower-cost alternative to residential long-term care in integrated systems of care delivery that include both sets of services.

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## Introduction

Despite the belief among many service providers and others that home care can be a lower-cost alternative to residential care, this has generally not been the finding from research conducted in this area. Indeed, research out of the United States, particularly in the 1970s and 1980s, concluded that home care was not cost-effective. This view became the dominant one, as reflected in a Robert Wood Johnson Foundation (1996, p. 4) call for research proposals on policy in aging in the United States in the mid 1990s. Their request for proposals stated, "The old rationale that increasing home care benefits pays for itself by keeping people out of nursing homes is no longer tenable, given research findings to the contrary." The lack of Canadian research on the cost-effectiveness of home care may, in large part, be attributed to acceptance of the U.S. conclusions. In the 1990s, Canadian research, however, began to emerge suggesting that home care could be a lower-cost alternative to residential care, at least within the context of the Canadian health care system (Hollander, 1994; HSURC, 1998).

The federal government was concerned with the lack of Canadian research in this area and, in the throes of health reform in the late 1990s, announced research dollars targeted to home care through the Health Transition Fund. This paper reports on the results of one of the studies funded under that program of research, which utilized administrative data from one province, British Columbia, over a 10-year period from fiscal years 1987/1988 to 1996/1997, inclusive. This was a relatively stable period in the structure and policies of the Continuing Care Division, which was responsible for home care and residential care services within the province. This paper examines the comparative costs, in costs to government, of long-term home care and residential care services.

## Review of the Literature

Much of the research that established that home care was not a lower-cost alternative to long-term facility care in the United States derived from two series of federally funded studies. In the late 1970s and early

1980s, 14 community care demonstration projects were funded. An additional 10 projects were funded from 1982 to 1985 for the American national long-term care demonstration generally referred to as channelling (Mathematica Policy Research, 1986). The channelling, and other studies, included random assignment to experimental and control groups and generally found that the experimental group (those receiving case management and enhanced home care services) had greater satisfaction and quality of life compared to those individuals in the community who received existing, or usual, home care. However, when the costs of the enhanced home care program were added in, the overall costs were generally greater for the enhanced home care recipients than for regular home care recipients, as the rates of admission to long-term care facilities were not significantly reduced for the enhanced home care group. This finding was at least partly attributable to the fact that many of the individuals receiving home care had relatively low levels of care (Hedrick & Inui, 1986; Skellie, Favor, Tudor, & Strauss, 1984). Weissert (1985) summarized many of these findings in his article on the seven reasons why it is so difficult to make community-based long-term care cost-effective. Weissert, Cready, and Pawelak (1988), in a comprehensive review of the literature, affirmed Weissert's earlier conclusion that home care is not cost-effective.

By the 1990s, a few studies, however, were suggesting the opposite. Greene, Ondrich, and Laditka (1998) re-analyzed the channelling data and found that an optimal allocation of home care services resulted in a 10 per cent reduction in overall costs rather than the 12 per cent cost increase produced by the demonstration itself. A Canadian study by Hux et al. (1998) compared community and facility costs for those with severe Alzheimer's disease and found that the costs for residential care were significantly higher than the costs of care in the community. In addition, Weissert, Lesnick, Musliner, and Foley (1997) found that the Arizona Medicaid long-term care program – which emphasized the use of home and community based services as an alternative to residential care – was operating at a substantial savings compared to

more traditional models of care delivery in the United States.

Both the differential health care systems in Canada and the United States, and recent studies suggesting that home care can be a lower-cost alternative to nursing home care, prompted the study reported here. Before discussing the study proper, a brief description of British Columbia's home care and long-term residential care delivery system is provided. This system is referred to as "continuing care" to denote that care continues over time, and across types of services. It incorporates a wide range of services for the elderly and adults with disabilities into an integrated system of care delivery.

### **An Overview of Continuing Care in BC**

Between 1978 and 1983, all continuing care services in British Columbia were integrated into one service delivery system under one branch, or division, of government, allowing system-wide planning, policy-making, administration, and care provision. This system was based on an amalgamation of assessment and treatment centres, day hospitals, and chronic care hospitals, from the acute care sector; long-term care facilities from the social service sector; home nursing care and community rehabilitation components from public health; and home support (non-professional) and other related services from the social service sector.

The British Columbia Continuing Care System, during the study period, had a single point of entry, system-wide case management, and case mix funding. The care delivery system was administered by the Continuing Care Division of the BC Ministry of Health. The system was also relatively distinct in that it used the same assessment process, and level of care categorization, for community based and residential care services. This allowed for comparisons of home care and residential clients who were at the same level of care (i.e., who had similar care needs). The levels were personal care (PC); Intermediate Care 1 (IC1); Intermediate Care 2 (IC2); Intermediate Care 3 (IC3); and Extended Care (EC). All levels of care except personal care were assessed as requiring at least some professional care. The highest level of care (EC), often referred to as chronic care, was for individuals who were assessed as requiring 24-hour-a-day professional nursing services and continuing medical supervision, but not requiring the resources of an acute care hospital, as they had limited potential for rehabilitation. Almost all residents of long-term care facilities in BC remained in facility care until death, and few, if any, returned to the community.

In assessment and care authorization, continuing care case managers conducted comprehensive assessments to determine client needs. They also developed a customized care plan for each client. Case managers could authorize needed services in the community, from the range of services available within the overall continuing care system. They could also authorize care in a long-term care facility. Unlike most other jurisdictions, the same case manager continued to assist the client, irrespective of the type(s) of care provided. Thus, the system-level case manager continued to be responsible for the client, and for future assessments and care levelling, even after the client entered a long-term care facility. For a detailed overview of the BC Continuing Care System, from the mid 1980s to mid 1990s (the period covered in this paper), see Hollander and Pallan (1995).

### **Research Methods**

#### *Data Sources*

The data used for the analyses reported here were obtained from the University of British Columbia's (UBC) linkable, longitudinal database containing British Columbia data for hospitals, physicians, drugs, continuing care, and some aspects of vital statistics (see Chamberlayne, Green, Barer, & Hertzman, 1998, for a discussion of the validity of this data set).

#### *Study Population*

The data used in this study were for three cohorts comprising people 65 years of age or older who had a new assessment for continuing care services in the 1987/1988, 1990/1991, and 1993/1994 fiscal years. An additional cohort for 1996/1997 was subsequently included in the analysis. The results were quite similar to the first three cohorts but are not presented here because of the major changes in the structure of health care delivery in BC in the late 1990s.

Data for each cohort were obtained for all new assessments for the initial fiscal year and for an additional 3 fiscal years, for each cohort. Thus, for example, data were obtained for the fiscal 1993/1994 cohort and clients continued to be tracked for the 1994/1995, 1995/1996, and 1996/1997 fiscal years. This ensured that data would be available for at least 3 years after assessment; that is, one could still have 3 years of data for people assessed on the last day of the cohort year (e.g., March 31, 1994). Cost and utilization data were collected for hospitals, fee-for-service physicians, drugs (through the BC Pharmacare Program), residential long-term care (including extended, or chronic, care beds in hospitals), direct

care (home nursing care, community physiotherapy and occupational therapy), homemaker services, and adult day care services.

A number of standard edit checks and procedures (e.g., range scores) were utilized to maximize the integrity of the administrative data sets used for the analyses and are summarized in Table 1. The final sample sizes for each of the 3 cohorts – all clients included in the analysis for this study, in fiscal 1987/1988, 1990/1991, and 1993/1994 – were 7,817, 9,023, and 9,344 respectively.

During the study period, significant numbers of persons changed their type of service or level of care: In 1987/1988, 22.05 per cent changed in the first 6 months, 16.32 per cent in the second 6 months, and 26.89 per cent in the next year. Only 34.73 per cent showed no change. The challenge was to decide how to compare home care and facility care clients at the same level of care without reducing the sample to such small numbers that comparative analyses would be meaningless.

#### *The FTE Client Methodology*

The response to this challenge was to construct full-time equivalent (FTE) clients for this study. This allowed the study team to utilize data for all clients who received care during a given period (e.g., 2 years) rather than only for clients who were at the same type and level of care for a limited time. In order to estimate service utilization across all classes of service for a given period for the FTE client, all episodes of care were divided into discrete care segments for home/community services and residential services. Each overall client care episode (the period between admission and discharge) was broken down into discrete segments (i.e., the period for each type and level of care for community or facility care). This allowed all service utilization, across all service categories, to be included for all clients. All services utilized by the client during the period for a care segment were linked to that care segment. Thus, a separate record was created for each care segment, which contained the anonymous client identifier, the duration and start and end dates of the segment, the level of care, the type of care, and all service utilization data for the time period of the segment. All segments were then grouped into 10 categories – five levels of care for home care and five levels of care for residential care. Total time for each of the 10 categories was calculated and divided by 364 days to obtain average FTEs per year for each level of care and type of care category (e.g., IC2 home care). All resources used, for each type of service, were also summed for each category. The sum was then divided

**Table 1: Sample selection**

	Cohorts (fiscal year)		
	1987/ 1988	1990/ 1991	1993/ 1994
Total Client Records Received (all new assessments in the fiscal year in British Columbia)	15,259	16,990	17,862
<b>MINUS</b>			
Duplicate Records	264	248	101
No Assessment <sup>a</sup>	109	0	67
Less Than 65 Years of Age	2179	2463	2792
Clients Who Received No Care	1567	1854	2422
Clients Who Were Ineligible or Declined Care	507	287	343
Clients Who Started Too Early <sup>b</sup>	45	18	19
Clients with No Care in the First Year after Assessment	1316	1139	794
Long Hospital Stays <sup>c</sup>	84	92	47
Clients with Short Stays <sup>d</sup>	1237	1685	1708
Outliers <sup>e</sup>	134	181	225
Clients Starting Care after April 1, 1997	N/A	N/A	N/A
Total Samples for the Three Cohorts	7817	9023	9344

<sup>a</sup>In this study a year is defined as being 364 days to ensure a standard number of days for each half year period (182 days) and each quarter (91 days). These exclusions are most likely clients who were admitted on the last day or two of the year (1988 was a leap year).

<sup>b</sup>Some clients started before the completion of their formal, first assessment. Clients who started care more than 60 days prior to their first assessment were excluded from the study.

<sup>c</sup>Clients with a continuous hospital stay of over 182 days were excluded from the study, as they would no longer have been Continuing Care clients.

<sup>d</sup>Clients with 90 days or fewer of care in the year after their first care service were excluded from the study, as the definition of long-term care clients refers to persons who require care for more than 90 days.

<sup>e</sup>Outliers are clients who had values that were more than five standard deviations from the mean for the average cost of MSP services, cost of prescription drugs, number of days in hospital, direct care visits, homemaker hours, and direct care days for the 2-year period after the beginning of care. The five standard deviations criterion was used because the distributions for costs and utilization were quite skewed, with most clients having relatively low levels of service, and decreasingly small numbers having increasing amounts of service. There was a high probability that these data points were data errors, given the policies and practices of the Continuing Care Division.



**Table 2: Selected sample characteristics**

	% for 1987/1988 <sup>1</sup>	% for 1990/1991 <sup>2</sup>	% for 1993/1994 <sup>3</sup>
<b>Gender</b>			
Male	36.7	37.5	36.8
Female	63.3	62.5	63.2
<b>Age at Assessment</b>			
65–74	36.2	35.7	33.3
75–84	48.3	48.6	49.4
85+	15.5	15.7	17.3
<b>Level of Care</b>			
Personal care	51.4	50.0	40.3
IC1	27.2	27.4	29.5
IC2	11.2	12.1	16.8
IC3	3.7	5.6	7.2
EC	6.5	4.8	6.2
<b>ADL Scores (1987/1988 only)<sup>4</sup></b>			
	Community	Facility	
Personal care	1.2	1.2	
IC1	1.4	1.5	
IC2	1.9	2.0	
IC3	2.3	2.4	
EC	3.0	3.4	

<sup>1</sup>n = 7817

<sup>2</sup>n = 9023

<sup>3</sup>n = 9344

<sup>4</sup>The ADL scores are from the more extensive 1987/1988 data that were used in the analysis. These data provided information on actual ADL scores, by question. Similar, detailed data were not available for 1990/1991 and 1993/1994. The total number of individuals in the analysis of ADL scores was 5,864 community clients and 828 facility clients, for a total of 6,692 clients. This number is lower than the sample of 7,817 clients for 1987/1988, because only people who had valid scores for all ADL questions were included in the analysis.

by the number of FTE clients to obtain average service utilization, by type of service, per FTE client, over a standardized period such as a year.

Data were also partitioned into those who remained in the same status over time and those who changed their status, in order to permit a direct comparison of costs by level of care for home care services and residential services for those who remained stable, and for those who changed their status. This also allowed for a cost comparison for those who died.

*Validation of Care Level Scores*

To validate the actual comparability of clients by level of care, for home care and residential care, community and facility clients were compared by their scores for a

set of activities of daily living questions. Average scores, for the individuals in this study – for ability to transfer, bathing, dressing, grooming/hygiene, eating, and bowel and bladder control – showed very high congruence in the overall level of disability. Average scores for extended care clients in facility care were, however, slightly higher than for those in home care. Table 2 provides an overview of client characteristics and disability scores by level of care. The care needs of clients in the community and in facilities were very similar for each level of care. This confirmation of the validity of the care levels allowed comparisons of the relative utilization and costs of home and residential care clients, by standardized levels of care, based on actual care needs, across home care and residential care services.

*Cost and Utilization Data*

In order to permit analyses of utilization and costs over time, cost comparisons were computed such that a 1-year average was computed from the 2-year period after admission to care, and for four sequential 6-month periods. For the number of days in each care segment, dollars and billable units were used for physician services (through the Medical Services Plan or MSP), and dollars and the number of prescriptions were used for Pharmacare. Service utilization units and dollars were keyed to each care segment to create a record of the type of care (home care or residential care), the level of care, and the cost and volume of services for all services included in the analysis. As noted above, total costs/services for all care segments for all clients were divided by the number of FTE clients for the period in question to obtain the average services and/or dollars for community and facility FTE clients, by level of care.

In order to be able to compare costs across the three cohorts, the middle year of the study, fiscal 1991/1992, was chosen as the indicator year for costs. Table 3 shows the comparative unit costs for hospital care and continuing care for fiscal 1991/1992. Average actual costs for MSP units and prescriptions were calculated for fiscal 1991/1992 for each type and level of care, and these standardized costs were applied to the units and prescriptions for each fiscal year in the analysis. The FTE client method allows for comparisons of averages but does not permit computation of statistical tests since one cannot produce variances, as the number of FTE clients is a calculated variable and does not represent specific individuals. However, the FTE method does maximize the comparability of service utilization and costs, for a given period, by level of care.

**Table 3: Estimated comparative unit costs to government for hospital care and continuing care**

Cost Category	Fiscal 1991/1992 (\$)
Hospital Per Diem (average per diem for community hospitals) <sup>a</sup>	425.00
Long-term Care Facilities (per diem costs) <sup>b</sup>	
PC	27.69
IC1	43.85
IC2	53.60
IC3	69.20
EC	108.21
Homemakers (per hour) <sup>b, c</sup>	17.18
Adult Day Care (per day) <sup>b, c</sup>	55.11
Direct Care (per visit) <sup>b, c</sup>	55.00

<sup>a</sup>In the late 1980s and early 1990s, Case Mix Groups (CMGs) and Resources Intensity Weight (RIWs) methodologies were still evolving. Different versions of RIWs were used over the study period, and it was not possible to standardize the approaches over a 10-year period. Thus, the average community hospital per diem was used in this analysis. Sensitivity analysis was also conducted to determine what impacts there would be on results if different hospital per diems were used.

<sup>b</sup>Based on expenditures data for the BC Ministry of Health and reported in Hollander, 1994.

<sup>c</sup>Includes an additional 10 per cent over the base unit cost to cover the costs of assessors/case managers.

## Results

Sample characteristics are provided for the first cohort (1987/1988) in Table 2. As shown in Table 2, just over a third (36.7%) of clients were males and 63.3 per cent were females. Just over a third (36.2%) were age 65 to 74, 48.3 per cent were between 75 and 84, and 15.5 per cent were 85 and more. Over half the sample (51.4%) were at the Personal Care level of care. Some 27.2 per cent of the sample were at IC1, 11.2 per cent were at IC2, 3.7 per cent were at IC3, and 6.5 per cent were at Extended Care.

Tables 4 and 5 show utilization and cost data by level of care for FTE clients for each of the three cohorts for an average year. Table 4 shows a pattern of increasing service utilization (in MSP service units) across cohorts for MSP services (e.g., for community IC3 clients the figures were 50.03, 53.73, and 55.34 units for fiscal 1987/1988, 1990/1991, and 1993/1994). For facility clients the comparable MSP numbers were 40.33, 43.85, and 44.30. A decreasing pattern of hospital utilization (days in hospital per year) for both community and facility clients was also noted (e.g., for community IC3 clients the figures were 27.76, 26.28, and 24.25, and for facility clients they were 7.48, 5.81, and 4.07, respectively).

Overall, costs for home care clients, by level of care, were some 40 to 75 per cent of the costs of facility care, with PC and IC1 at about 40 per cent, IC2 and IC3 at about two-thirds, and EC at about three-quarters of the costs for comparable facility clients (see Table 5). As can also be seen in Table 5, the costs for home and community based continuing care services only (that is, direct care, homemakers, adult day care, and assessors) are about 20 to 30 per cent of the costs of residential long-term care across levels of care. Hospital costs accounted for 50 to 60 per cent of the overall health costs for home care clients and medical services for 5 to 10 per cent for a total of up to 70 per cent, or just over two-thirds, of health care costs for home care clients. Hospital and medical costs accounted for approximately 15 per cent of the costs for clients in facilities, while long-term care facility care accounted for about 80 per cent of the health care costs for clients in facilities.

Table 6 presents the average annual costs for different types of clients. The costs were calculated on the basis of 6-month periods. The data show that for home care clients who remain at the same type and level of care, the costs were about half or less of the average costs of facility care, for comparable clients. For clients who change their type and/or level of care in one or more 6-month periods (and did not die) the costs were about 70 per cent of the costs of facility clients for those at PC and IC1 levels, about 80 to 90 per cent for IC2 and IC3 clients, and about 90 per cent or more for EC clients. In contrast to the above, the costs for home care clients who died in a given 6-month period were higher for all levels of care than for facility clients who died.

### Sensitivity Analysis

Sensitivity analyses were conducted to determine if the method of using FTE clients may have produced artificial results that cannot be generalized to the real world. An analysis of utilization and costs was conducted for individual clients based only on their type and level of care at the start of care. Thus, this analysis included people who started out as home care clients but were later admitted to a facility. While the average annual cost differentials for the initial designation method were somewhat narrower, the overall pattern of home care clients having a lower cost of care, by level of care, compared to facility clients, was still quite consistent with the FTE method. Table 7 presents data for this cohort of clients and for FTE clients. As can be seen, the results are similar for clients using the FTE client approach and the designation at the start of care approach. The costs are somewhat higher for individuals at the PC to IC2

**Table 4: Comparison of average annual service utilization, for FTE clients, by level of care**

		Average Service Utilization for 1 Year					
		1987/1988		1990/1991		1993/1994	
		Community	Facility	Community	Facility	Community	Facility
FTE Clients (N)	Personal Care	3004.34	98.12	3609.54	30.52	2814.30	3.60
	IC1	1381.67	273.14	1727.44	159.87	1920.02	85.09
	IC2	499.28	278.15	689.73	300.91	966.27	430.16
	IC3	131.27	250.73	210.02	293.11	290.61	376.87
	Extended Care	101.15	362.31	94.84	352.58	127.29	469.39
MSP Units	Personal Care	40.03	33.48	42.85	38.86	47.31	35.12
	IC1	47.34	40.63	49.10	45.05	53.56	46.16
	IC2	49.58	44.73	51.61	44.13	53.73	45.02
	IC3	50.03	40.33	53.73	43.85	55.34	44.30
	Extended Care	60.49	34.96	68.68	31.94	69.09	32.27
Pharmacare Prescriptions	Personal Care	17.11	36.90	19.42	41.34	17.80	21.80
	IC1	20.80	39.84	22.54	51.38	21.40	45.68
	IC2	20.09	39.69	23.57	48.54	22.44	49.85
	IC3	17.19	35.10	23.23	42.51	21.75	43.29
	Extended Care	22.56	10.55	27.85	11.09	24.81	11.98
Acute Hospital Days	Personal Care	5.89	4.36	5.11	2.31	4.63	2.22
	IC1	13.11	7.14	12.11	6.02	9.37	6.09
	IC2	22.63	7.48	19.90	5.89	15.98	4.77
	IC3	27.76	7.48	26.28	5.81	24.25	4.07
	Extended Care	40.83	2.99	44.76	1.96	31.57	2.00
Direct Care Visits	Personal Care	2.75	0.00	2.39	0.00	2.08	0.00
	IC1	7.60	0.00	7.34	0.00	5.27	0.00
	IC2	12.20	0.00	10.08	0.00	9.29	0.00
	IC3	13.55	0.00	15.48	0.00	13.94	0.00
	Extended Care	26.92	0.00	29.75	0.00	30.16	0.00
Homemaker Hours	Personal Care	72.37	0.00	78.91	0.00	75.69	0.00
	IC1	122.19	0.00	138.33	0.00	122.66	0.00
	IC2	216.21	0.00	247.31	0.00	227.98	0.00
	IC3	328.45	0.00	396.49	0.00	408.41	0.00
	Extended Care	413.04	0.00	576.80	0.00	604.26	0.00
Adult Day Care Days	Personal Care	1.15	0.00	1.11	0.00	1.13	0.00
	IC1	7.21	0.00	7.30	0.00	7.16	0.00
	IC2	12.09	0.00	15.45	0.00	17.67	0.00
	IC3	15.89	0.00	17.94	0.00	18.92	0.00
	Extended Care	8.34	0.00	9.27	0.00	7.03	0.00
Long-term Care Facility Days	Personal Care	0.00	363.47	0.00	363.56	0.00	363.86
	IC1	0.00	362.39	0.00	362.98	0.00	362.72
	IC2	0.00	361.17	0.00	362.14	0.00	362.66
	IC3	0.00	361.69	0.00	360.70	0.00	362.29
	Extended Care	0.00	362.86	0.00	363.18	0.00	363.58

levels, and the costs are the same or lower for IC3 and EC clients. This sensitivity analysis was conducted to assess the real world accuracy of our results using the FTE method.

We would argue, however, that the FTE analysis is more precise because the analysis using actual people incorporates different patterns of care trajectories over time (e.g., some people who started in the

community moved into a facility fairly soon after entry into the program). Thus, the community group would be contaminated to the extent that it contained not only people who were in the community during the study period, but also people who spent time in both home care and residential care during the study period. The FTE approach avoids this type of contamination and maximizes pure comparisons across types of care, for each level of care.

**Table 5: Comparison of average annual costs, for FTE clients, by level of care in 1991/1992 dollars**

		Average Costs for 1 Year					
		1987/1988		1990/1991		1993/1994	
		Community	Facility	Community	Facility	Community	Facility
FTE Clients (N)	Personal Care	3004.34	98.12	3609.54	30.52	2814.30	3.60
	IC1	1381.67	273.14	1727.44	159.87	1920.02	85.09
	IC2	499.28	278.15	689.73	300.91	966.27	430.16
	IC3	131.27	250.73	210.02	293.11	290.61	376.87
	Extended Care	101.15	362.31	94.84	352.58	127.29	469.39
All Costs (\$)	Personal Care	5505.89	13186.73	5413.16	12504.54	5190.72	12137.07
	IC1	10303.09	20375.47	10241.82	20185.97	8762.18	20150.58
	IC2	16481.89	24109.59	16081.34	23597.33	14176.47	23189.19
	IC3	20759.61	29598.94	21786.06	29000.83	21091.78	28395.42
	Extended Care	28529.36	41483.97	33579.41	41022.56	28258.70	41102.53
MSP (\$)	Personal Care	974.64	801.12	1043.30	929.95	1151.85	840.47
	IC1	1164.35	887.34	1207.58	983.83	1317.48	1008.05
	IC2	1186.56	1016.62	1234.95	1003.00	1285.73	1023.16
	IC3	1187.52	911.82	1275.30	991.38	1313.64	1001.49
	Extended Care	1444.88	794.05	1640.46	725.41	1650.17	732.94
Pharmacare (\$)	Personal Care	572.15	469.48	649.09	525.88	595.02	277.28
	IC1	652.18	564.53	706.61	728.14	670.78	647.32
	IC2	625.29	556.66	733.37	680.81	698.29	699.17
	IC3	511.12	479.79	690.62	580.98	646.61	591.71
	Extended Care	695.95	154.91	859.26	162.85	765.41	175.91
Acute Hospitals (\$)	Personal Care	2501.61	1851.64	2172.60	981.80	1967.19	944.01
	IC1	5572.00	3032.60	5145.31	2557.46	3982.68	2589.74
	IC2	9618.47	3177.38	8458.38	2502.70	6790.59	2028.36
	IC3	11797.64	3178.19	11168.30	2467.86	10305.97	1731.58
	Extended Care	17352.52	1269.80	19023.52	834.73	13415.73	850.20
Direct Care (\$)	Personal Care	151.05	0.00	131.35	0.00	114.37	0.00
	IC1	418.18	0.00	403.55	0.00	289.61	0.00
	IC2	670.93	0.00	554.53	0.00	511.16	0.00
	IC3	744.98	0.00	851.60	0.00	766.67	0.00
	Extended Care	1480.39	0.00	1636.09	0.00	1658.79	0.00
Homemakers (\$)	Personal Care	1243.28	0.00	1355.76	0.00	1300.29	0.00
	IC1	2099.23	0.00	2376.53	0.00	2107.22	0.00
	IC2	3714.43	0.00	4248.87	0.00	3916.64	0.00
	IC3	5642.82	0.00	6811.76	0.00	7016.47	0.00
	Extended Care	7096.06	0.00	9909.40	0.00	10381.18	0.00
Adult Day Care (\$)	Personal Care	63.16	0.00	61.06	0.00	62.00	0.00
	IC1	397.17	0.00	402.24	0.00	394.41	0.00
	IC2	666.22	0.00	851.23	0.00	974.06	0.00
	IC3	875.52	0.00	988.47	0.00	1042.43	0.00
	Extended Care	459.56	0.00	510.69	0.00	387.43	0.00
Long-term Care Facilities (\$)	Personal Care	0.00	10064.48	0.00	10066.91	0.00	10075.31
	IC1	0.00	15891.00	0.00	15916.55	0.00	15905.48
	IC2	0.00	19358.92	0.00	19410.83	0.00	19438.50
	IC3	0.00	25029.13	0.00	24960.61	0.00	25070.64
	Extended Care	0.00	39265.22	0.00	39299.56	0.00	39343.40

The costs for MSP and Pharmacare are believed to be accurate, as they are based on actual payment systems, so there was little need to conduct sensitivity analysis on these unit costs per se. If one varies the unit cost estimate of drugs, physicians, direct care, and adult day care significantly (by 20%, or even 50%)

there is no noticeable effect on the relative cost of home care services compared with residential care. Next to hospital care, the largest cost component of home care was homemaker services. A 20 per cent increase in the unit cost, or in the volume of services provided, increased the overall health care costs of



**Table 6: Comparisons of the average annual costs, for different types of FTE clients, by level of care, in one or more 6-month periods, in 1991/1992 dollars**

		Same Type and Level of Care		Changed Care Type and/or Level of Care		Changed Type and/or Level of Care But Did Not Die		Home Care Clients Who Died*	
		Community	Facility	Community	Facility	Community	Facility	Community	Facility
All Costs 1987/ 1988 Cohort (\$)	Personal Care	4352.90	11194.14	12681.66	16267.61	11145.85	15957.16	28579.61	23984.59
	IC1	7234.32	17199.64	19505.80	24145.08	16769.03	23117.98	41393.38	37668.72
	IC2	11139.77	20904.00	25524.73	27465.03	21773.14	26410.47	50057.34	41105.06
	IC3	13058.92	26359.59	28745.23	33408.84	23776.27	32344.09	56522.28	43018.34
	Extended Care	16254.73	40730.63	41163.53	43358.09	37399.41	42826.06	51542.34	45050.34
All Costs 1990/ 1991 Cohort (\$)	Personal Care	4524.91	11476.88	13284.21	14538.64	11143.73	14227.93	31672.83	20524.14
	IC1	7714.59	17901.81	19484.17	22755.39	16001.34	22358.42	41435.72	28566.97
	IC2	10603.89	20913.81	26785.22	26328.36	22803.13	25163.14	48935.84	38187.94
	IC3	13936.41	26723.47	30775.28	31731.97	25996.13	31084.45	50114.88	32276.00
	Extended Care	19538.94	40541.28	46690.59	42166.06	43725.50	41876.34	54287.22	42839.88
All Costs 1993/ 1994 Cohort (\$)	Personal Care	4299.60	10911.05	11424.63	13297.55	9888.07	13297.55	28394.88	0.00
	IC1	6506.41	17165.52	17853.30	24267.44	14936.35	22245.58	38012.69	44946.25
	IC2	9580.36	21047.14	23348.81	25671.56	20567.66	25255.28	44034.19	30569.77
	IC3	12727.87	26513.69	30841.44	30637.33	27461.75	30015.08	47148.97	34566.63
	Extended Care	16203.60	40443.16	41899.09	42412.66	39483.34	41736.72	46995.19	44295.53

\* It was not possible to separate out clients who received palliative care per se. This column simply refers to people who were in home care or residential care and died. Thus, this column should not be taken to reflect costs related to home and facility based palliative care.

home care clients by 10 per cent. The findings for home care clients are somewhat sensitive to the hospital per diem rate, and the average number of days home care clients spend in the hospital, particularly for clients at the higher levels of care. A 50 per cent increase in hospital unit costs or in utilization would increase the overall costs of home care clients by about 25 per cent. In terms of facility care, the results are fairly sensitive to the per diem rates of facilities, as they account for most of the cost for facility clients. Any increases to facility per diems would, in turn, increase the cost differential between home care and residential care services.

### Substituting Home Care for Residential Care Services

A key question related to this analysis is whether one can actually substitute home care services for residential care services and, thus, derive cost savings in the real world. If there is no substitution, home care is likely to constitute an add-on cost. There is evidence from the Continuing Care System in British Columbia that one can indeed successfully substitute home care services for residential care services.

Figure 1 presents utilization data framed into four major periods in the history of continuing care services in British Columbia. The first period was

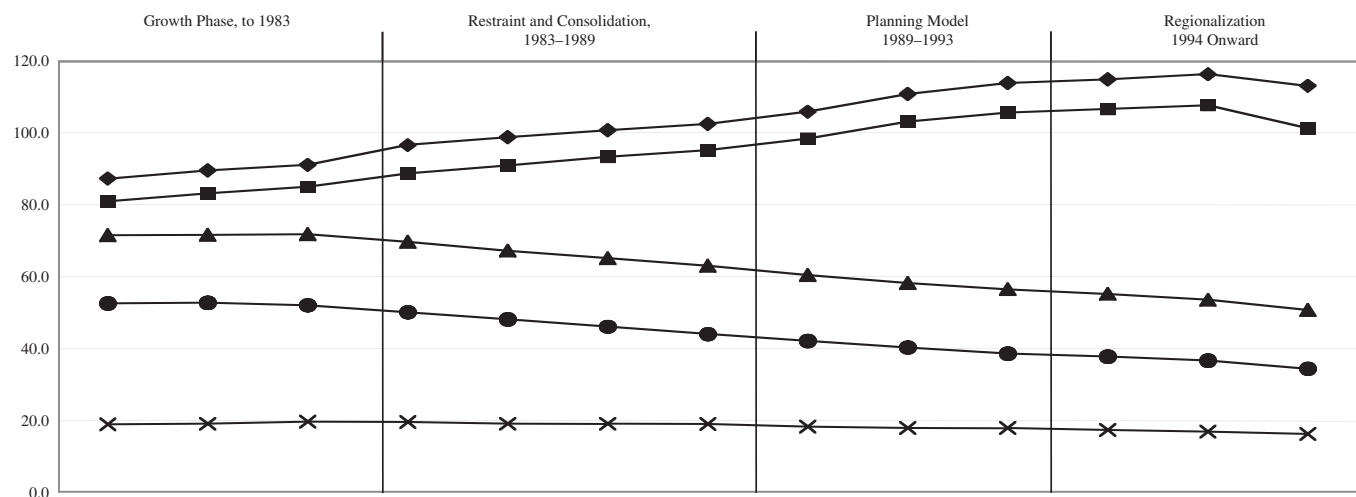
the growth phase of facility construction that started in the 1970s and came to an end in the 1983/1994 fiscal year. There was a period of fiscal restraint in the mid 1980s in which, by policy, further bed construction was frozen and there was a focus on home and community care. A planning and resource allocation model (Hollander and Pallan, 1995) – the third phase – came into play in the 1989/1990 fiscal year and lasted for an additional 3 years. A termination of service for many lower care needs homemaker clients came into effect in the 1994/1995 fiscal year. Regionalization of health services also started in the mid 1990s.

It can be seen from Figure 1 that the effects of the policy that was in place during the mid 1980s not to increase facility beds had reached a plateau in 1987 to 1989, with annual utilization increases averaging about two clients per 1,000 population 65 years of age or older during this period. The policy of not increasing beds did provide for a substitution of services as new resources were moved to home care while bed growth was frozen.

The growth rate of community services in 1989/1990 to 1993/1994 shows that further efficiencies were obtained, particularly in the early years of the planning model. While total utilization remained the same, for the 1985 to 1995 period, there was a

**Table 7: Comparison of average annual costs, for FTE clients and for individual clients based on their initial type and level of care at the start of care, by level of care, in 1991/1992 dollars**

		All FTE Clients		Individual Clients	
		Community	Facility	Community	Facility
All Costs 1987/1988 Cohort (\$)	Personal Care	5505.89	13186.73	7031.27	14396.84
	IC1	10303.09	20375.47	13206.72	24040.33
	IC2	16481.89	24109.59	19179.52	27896.03
	IC3	20759.61	29598.94	23346.59	30013.72
	Extended Care	28529.36	41483.97	26579.56	39995.25
All Costs 1990/1991 Cohort (\$)	Personal Care	5413.16	12504.54	6643.68	13869.85
	IC1	10241.82	20185.97	12875.95	22882.30
	IC2	16081.34	23597.33	18737.67	27217.61
	IC3	21786.06	29000.83	21902.50	30897.03
	Extended Care	33579.41	41022.56	29370.45	38743.97
All Costs 1993/1994 Cohort (\$)	Personal Care	5190.72	12137.07	6294.80	14252.32
	IC1	8762.18	20150.58	11521.31	23934.41
	IC2	14176.47	23189.19	18337.36	24730.48
	IC3	21091.78	28395.42	19810.73	29379.63
	Extended Care	28258.70	41102.53	24378.69	39060.66



	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
◆ Community	87.2	89.5	91.0	96.5	98.7	100.7	102.4	105.8	110.8	113.8	114.8	116.2	113.0
■ Homemakers	80.9	83.1	84.9	88.7	90.9	93.3	95.1	98.4	103.0	105.5	106.5	107.6	101.2
▲ Residential	71.5	71.6	71.7	69.7	67.2	65.1	63.0	60.4	58.2	56.5	55.2	53.5	50.7
● LTC Facilities	52.5	52.7	52.0	50.1	48.1	46.1	44.0	42.1	40.3	38.6	37.8	36.7	34.4
★ EC Hospital	18.9	19.1	19.7	19.6	19.1	19.1	19.0	18.3	17.9	17.9	17.4	16.9	16.3

Utilization rates per 1,000 population aged 65 and over by fiscal year, and type of care.

Fiscal year 1982 is for the period April 1, 1982 to March 31, 1983.

**Figure 1: Major phases in the utilization of home care and residential care services**

significant decrease in long-term care bed utilization (from 71.7 beds per 1,000 65 years of age or older to 50.7) and an increase in home care utilization (from 92 to 113).

Figure 1 demonstrates that, at a systems level, it appears to be possible to substitute home care services

for residential care services over time. This shift should, in turn, result in reduced overall costs for the system of care, given the cost differentials in home care compared to residential care noted in Table 5. Increases in the utilization of home care were offset by decreases in the utilization of residential care services. It should be noted that the data presented here deal

with average annual costs. Analysis of utilization patterns indicates that one of the factors contributing to the lower costs is that home care may not be provided daily, while at least some facility care is provided daily (Hollander, 1994). In fact, home care may cost more, less, or the same, as residential care, for the days in which home care is actually provided. Given that the analysis presented here included home care for individuals with higher care needs, the actual pattern of service provision between home care and residential care would be an important area for further research, particularly for clients with high care needs.

A related issue is outcomes. If the volume and pattern of service provision is different between home care and residential care, with the result that home care is less costly, for individuals with comparable care needs, what about outcomes? Given that this study dealt with administrative data sets, outcome data were not available and, thus, this analysis focuses on the comparative costs to government of home care and residential care. However, other studies indicate that client satisfaction and outcomes, for home care clients, are as good as, or better, than for residential care clients. For example, a related study conducted in Victoria, BC, and Winnipeg, MB, found that client satisfaction and quality of life were the same, or slightly better, in home care compared to residential care (Chappell, Havens, Hollander, Miller, & McWilliam, 2004).

An important methodological issue that relates to the findings in this paper is that of the "woodwork" effect: More individuals than anticipated may take advantage of a new program, for several reasons. Individuals may not have found any of the previously existing sets of services suitable, and/or may simply have suffered without receiving care, for lack of services. When a desirable new program is introduced, many more people than anticipated may take advantage of the new program. For example, if a new and/or enhanced home care program is introduced and cost estimates are based on admissions to previously existing programs, residential waiting lists, and/or other such factors, the original cost estimates may be too modest. Thus, while there may be some lower-cost substitution effect of home care for residential care, at a broader systems level, the new program may be more costly as many more people than anticipated may take advantage of the program. The net effect is that the new program actually increases overall health care costs as a result of the unanticipated number of people who come out of the "woodwork" to seek care.

While it is important to compare unit costs for home care and residential care, as is done in this paper, these cost comparisons must be considered in a broader context, as it could be that even though the comparative costs of home care are less, the overall system costs could be greater if there is a "woodwork" effect. While the "woodwork" effect needs to be considered for newly instituted programs, we would argue that to the extent that there may have been such an effect in regard to the BC Continuing Care System it would have dissipated by the time our study was conducted. The BC Home Care/Long-term Care Program was introduced in 1978 and professional home care services were integrated into this program in 1983. Thus, there was considerable time for people to learn about the program before the study reported here was conducted. There was also considerable stability in the BC Continuing Care Program from the mid 1980s to the mid 1990s – the period of our analysis. In addition, examination of service utilization patterns for continuing care services does not show the type of new admission spikes that would have occurred if there had been a "woodwork" effect during the study period.

A substitution effect similar to the one found in this study was also found in Denmark during the same period as in British Columbia. Stuart and Weinrich (2001) conducted a broad systems level analysis of the costs of continuing care services in Denmark by comparing the cost trends in Denmark and the United States. Denmark has for many years had an integrated system of care delivery for the elderly and persons with disabilities that puts a priority on home and community care. The authors found that, over the 12-year period after this integrated system was put in place, Danish long-term care expenditures levelled off, while expenditures in the United States continued to increase over the same period. More specifically, they found that, for the period 1985 to 1997, per capita expenditures on continuing care services per persons 65 years of age or older increased by 8 per cent in Denmark and 67 per cent in the United States. For persons 80 years of age or older, costs actually decreased by 12 per cent in Denmark while they increased 68 per cent in the United States. It appears that the savings in Denmark were the result of reducing nursing home beds by 30 per cent. In the United States, over the same period of time (1985 to 1997) there was a 12 per cent increase in nursing home beds. This finding further corroborates the findings from British Columbia that it is possible, in the real world and on a system-wide basis, to make actual substitutions of lower cost home care services

for residential care services, in integrated systems of care delivery.

## Discussion and Conclusions

Using a strategy of full-time equivalent clients, this paper has provided costing data from British Columbia, comparing the public costs of long-term home care with facility care for clients at the same level of care, using provincial administrative data. This was possible because the province utilizes the same assessment and classification system for long-term care clients, irrespective of whether they are in the community or in long-term care facilities. The findings suggest that home care has the potential to be a lower-cost alternative to residential care for government funders if one can appropriately substitute home care services for residential care services at a system-wide level. In addition to this overall finding, a number of particular points have arisen from these analyses. For example, the significant costs of hospital care for home care clients is a critical new finding with major policy and program implications. Home care services per se were found to be of relatively modest cost. If means can be found to reduce hospital care for those on home care without sacrificing the quality of care, considerable savings might be achieved.

Another issue is that of stability – home care may not be a particularly lower-cost alternative for those who change their type and/or level of care and, according to these findings, is more costly for those who are in home care and who die. (i.e., for home care the costs are in the transitions). Thus, there appear to be potential cost savings if one can find ways to re-stabilize clients as quickly as possible. Also, given that overall costs appear to be higher for home care clients than residential care clients who die, and that much of this is due to costs associated with stays in hospital, there appears to be considerable potential for cost savings through new and innovative programs for home based palliative care and hospice care.

It should be noted that other costs such as ambulance services, hospital emergency, outpatient services, as well as those of alternative health providers such as acupuncturists, herbalists, and a range of other such practitioners, and over-the-counter drugs and prescription drugs not covered by Pharamacare, are not included in this study. Informal caregiving as well as out-of-pocket expenses for clients have also not been considered here. However, a related study (Chappell et al., 2004) found that there are also potential cost savings even if one uses a broader societal perspective and includes out-of-pocket

expenses for clients and family caregivers, and the time of caregivers, in the analysis.

Finally, the differences between this study and the early American literature warrant comment. American nursing homes provide a variety of services including post-acute and/or other short-term services, while in Canada residential care is typically provided on a long-term basis. Thus, there is a high degree of targeting in the selection of residential care clients in Canada. The American research of the 1980s essentially evaluated a policy choice of bringing about efficiencies by expanding funding for enhanced home care programs in a market/insurance based service delivery model. The study reported here has looked at comparative costs of home care and residential care services in a government-managed system of care. It is important to note that, in the 1990s, managed care models became more popular in the United States and that Arizona implemented a continuing care system that had many features similar to the British Columbia model. It was this system that Weissert et al., (1997) found was, in fact, cost-effective.

Overall, the results presented here lend strong support to the argument that home care can be a lower-cost alternative to residential services, to the extent that actual substitutions can be made. This does not mean that home care is automatically a lower-cost alternative. If monies are not redistributed from long-term institutional care to home care, or if more money is not put into home care while long-term care beds remain constant, that is, if there is no actual substitution then home care will generally not be a lower-cost substitute for residential care.

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