Living at home or in an institution: What makes the difference for seniors?

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Abstract

Objectives

This article examines some of the health and socio-demographic factors associated with living in long-term health care facilities rather than in private households, for elderly people with various levels of disability.

Data source

The data are from the 1996/97 National Population Health Survey conducted by Statistics Canada. Data from a sample of 1,711 people aged 65 or older living in long-term health care facilities and 13,363 in private households were weighted to represent about 185,100 and 3.4 million seniors, respectively.

Analytical techniques

Descriptive data were produced using bivariate frequencies. Multiple logistic regression models were used to examine associations between living in long-term health care facilities and selected health and socio-demographic characteristics for seniors with self-reported severe, moderate or no disability.

Main results

While health status was strongly associated with residence in a long-term health care facility, the absence of a spouse, low income, low education, and advanced age were also significant.

Key words

homes for the aged, nursing homes, disability, health utilities index, socioeconomic factors

Authors

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The link between advanced age and activity limitations, and between such limitations and institutionalization, has been repeatedly demonstrated.[1,2] Consequently, as the population ages, the need for institutionalization is likely to grow and exert increasing financial pressure on the health care system.

In 1995, just 1% of the total Canadian population lived in long-term health care facilities.[3] The proportion was higher at older ages: 5% for people aged 65 or older, and 18% at age 80 or older. If these rates persist, Statistics Canada's latest population projections[4] suggest that the number of beds required in long-term health care facilities could rise from 184,300 in 1996/97 to over 565,000 in 2031. Other researchers have estimated that an even higher number of elderly people will be in institutions by 2031—746,000.[5] Earlier studies, however, have shown that the number of beds required depends not only on the absolute number of elderly persons and their health status, but also on their socio-demographic characteristics.[6-10]

Methods

Data source

This article is based on data from Statistics Canada's National Population Health Survey (NPHS). The NPHS, which began in 1994/95, collects information about the health of the Canadian population every two years.[11,12] It covers household and institutional residents in all provinces and territories, except people living on Indian reserves, on Canadian Forces bases, and in some remote areas. The NPHS has both a longitudinal and a cross-sectional component. Respondents who are part of the longitudinal component will be followed for up to 20 years.

This analysis uses cross-sectional data from cycle 2 of the NPHS, conducted in 1996/97. The data pertain to the population in households and in long-term health care facilities in the 10 provinces.

The 1996/97 cross-sectional household sample is made up of a longitudinal component and one-time respondents who were selected as part of supplemental samples, or buy-ins, in three provinces. The additional respondents for the buy-ins were chosen with the random digit dialing (RDD) technique and were included for cross-sectional purposes only.

Individual data are organized into two files: General and Health. Socio-demographic and some health information was obtained for each member of participating households. These data are found in the General file. Additional in-depth health information was collected for one randomly selected household member. The in-depth health information, as well as the information on the General file pertaining to that individual, is found in the Health file.

Among individuals belonging to the cross-sectional buy-in component, one knowledgeable person provided the socio-demographic and health information about all household members for the General file. As well, one household member, not necessarily the same person, was randomly selected to provide in-depth health information about himself or herself for the Health file.

Among individuals belonging to the longitudinal component, the person providing in-depth health information about himself or herself for the Health file was the randomly selected person for that household in cycle 1 (1994/95) and was usually the person who provided information on all household members for the General file in cycle 2.

The 1996/97 cross-sectional response rates for the Health file were 93.6% for the longitudinal component and 75.8% for the RDD component, yielding an overall response rate of 79.0%.

Data for the institutional component of the 1996/97 NPHS came from 212 institutions in the 10 provinces. To obtain the institutional sample, lists of health care facilities with long-term residents were drawn up and stratified according to geographic region and type and size of facility. Provincial ministries of health verified and updated these lists to ensure accuracy. The institutions were classified by the dominant type of care provided, and only those providing long-term care (a period of at least six months) were retained. A random sample was selected from the final list. The sample was restricted to facilities with at least four beds that provided long-term care to residents with health problems. With help from administrators in each institution, a subsample of residents was randomly selected. The administrator determined if these individuals were capable of answering the questionnaire or if a proxy respondent was required. The proxy respondent could be a relative, or a staff member or volunteer working in the institution.

Questions for the institutional component were designed to be asked through personal, on-site interviews. Telephone interviews were allowed when it was not possible to interview the respondent on site.

The sample size was 2,393 for long-term health care facilities and 81,804 for private households. This analysis of people aged 65 or older is based on 1,711 respondents in institutions and 13,363 in private households, representing about 185,100 and 3.4 million seniors, respectively.

Analytical techniques

With cross-sectional data, frequencies were used to demonstrate that the various disability levels were associated with health status, as measured by the Health Utilities Index (see *Health Utilities Index*), thereby providing evidence of construct validity. Cross-tabulations were also used to describe people aged 65 or older, according to their disability level and their place of residence.

Multiple logistic regression was used to model associations between health and socio-demographic variables and place of residence. Five separate logistic regressions were modeled. The first compares the characteristics of individuals living in long-term health care facilities with those of residents of private households. Separate regressions compare individuals according to their place of residence for each level of disability: severe, moderate and no disability. A final regression compares the characteristics of individuals with severe or moderate disability in private households with those of disability-free individuals in institutions, to reveal factors other than health status that are related to institutionalization.

The data were weighted so that the sample represents the population of Canada. Nonetheless, the complex sampling design of the NPHS presents a problem for the derivation of unbiased estimates of the variance. To partially reduce the bias, the weights were normalized (by dividing each weight by the global average weight) to average 1. In addition, tests with p-values less than 0.01 (instead of 0.05) were considered significant to partially account for the larger variance estimates that would have been obtained if full account had been taken of the survey design. Nonetheless, the odds ratios reported in this article should be viewed with caution. Their standard errors, and hence, confidence intervals, may be underestimated.

Most of these studies have not examined the factors associated with institutionalization of elderly people, while controlling for level of disability. This analysis, by contrast, uses cross-sectional data from the household and institutional components of the 1996/97 National Population Health Survey (NPHS) to identify characteristics associated with residing in long-term health care facilities among elderly people with severe, moderate or no disability (see *Methods*, *Definitions* and *Limitations*).[13]

The Health Utilities Index and disability

The Health Utilities Index (HUI) is a summary measure of health (see *Health Utilities Index*). It combines the functional aspects of health, such as mobility and cognition, with a valuation component to produce an overall score, or index, for each individual.

Given the functional components of the Health Utilities Index, HUI scores should reflect levels of disability. That is, people with severe disability

Definitions

In the National Population Health Survey (NPHS), long-term health care facilities were defined as public or private residential care facilities or hospitals with at least four beds, that provide care for periods of at least six months. Hospitals, nursing homes and residential facilities for people with disabilities are examples. Those on military bases, in correctional institutions, in religious centres, or on Indian reserves were excluded.

Questions on activity limitation and dependence were used to define *disability* levels. The questions for respondents in long-term health care facilities differed slightly from those asked of private household residents.

To determine an activity limitation, residents of institutions were asked: "Because of a long-term physical or mental condition or a health problem, are you limited in the kind or amount of activity you can do: within the residence or institution? outside the residence or institution in activities such as travel, recreation or leisure?" They were also asked: "Do you have any long-term disabilities or handicaps?" Residents of private households were asked: "Because of a long-term physical or mental condition or a health problem, are you limited in the kind or amount of activity you can do: at home? in other activities (such as leisure)?" and "Do you have any long-term disabilities or handicaps?" In each instance, respondents who replied affirmatively to at least one of these questions were categorized as persons whose activities were restricted.

To evaluate dependence, residents of institutions were asked: "Because of any condition or health problem, do you need the help of another person with: personal care such as bathing, dressing or eating? moving about inside the residence or institution?" A similar question was asked of private household residents: "Because of any condition or health problem, do you need the help of another person: in personal care such as washing, dressing or eating? in moving about inside the house?" Respondents who reported needing assistance with at least one of these activities were classified as dependent.

The responses to the activity limitation and dependence items were combined to define three levels of *disability*: severe, moderate and no disability (Appendix Table A). People classified as having severe disability had activity limitation and dependence. Those with moderate disability had activity limitation but no dependence, or dependence but no activity limitation. Those with no disability had neither activity limitation nor dependence.

For this analysis, five *age groups* were established: 65 to 69, 70 to 74, 75 to 79, 80 to 84, and 85 or older.

Marital status was defined as: married/common-law, single, widowed, or separated/divorced.

Education was categorized as: none, primary, some high school, high school graduation, some postsecondary, or postsecondary graduation.

Four sources of *income* were identified: retirement income (Canada/Québec Pension Plan, other private pensions), transfers (Old Age Security, Guaranteed Income Supplement), investment income (Registered Retirement Savings Plan, dividends and interest), and employment (salary, wages, income from self-employment). These sources were used to construct the variable number of sources of income.

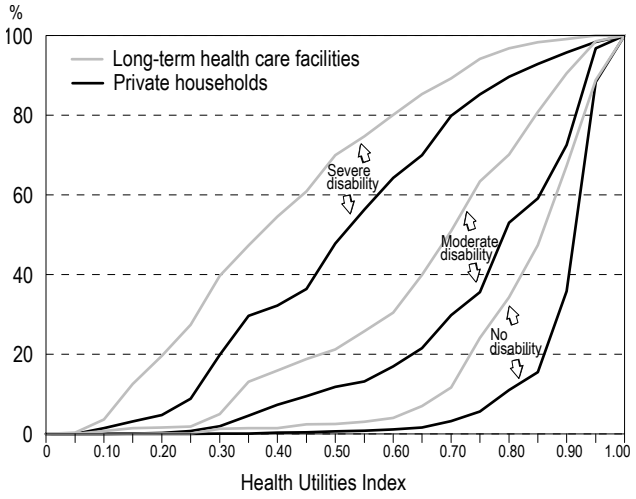
Respondents were asked if a health professional had diagnosed them as having a *chronic condition*. Based on a review of the literature and preliminary multivariate analyses, the following conditions were selected for this analysis: Alzheimer's disease or other dementia, urinary incontinence, ulcers, arthritis, effects of stroke, bowel disorders, high blood pressure, bronchitis or emphysema, epilepsy, and heart disease.

should have low scores, whereas scores among those free of disability should be relatively high. This pattern prevailed among the elderly in 1996/97 (Chart 1). The cumulative percentage curves indicate that the proportion of elderly people with low HUI scores (poor functional health) was greater among those with severe disability than among those with moderate or no disability.

In addition, at each level of disability, the proportion of elderly people with low scores tended to be higher among those in long-term health care facilities than in private households. For instance, among people with severe disability, HUI scores of 0.2 or less accounted for 20% of institutional residents, but only 5% of private household residents.

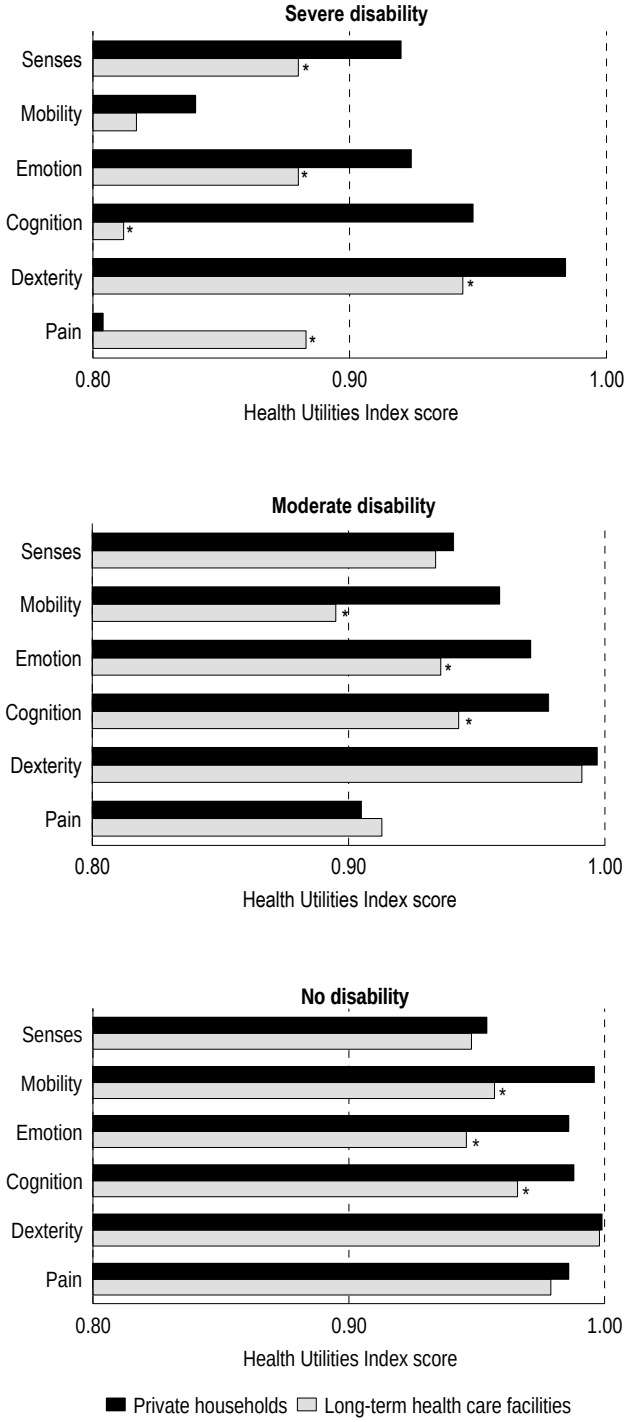
Comparisons of the various components of HUI scores (senses, dexterity, etc.) for people at the same level of disability in long-term health care facilities with those for individuals in private households reveal the components associated with being in an institution (Chart 2). Among people classified as having severe disability, the mean of the cognition

Chart 1
Cumulative percentage of Health Utilities Index, by disability level and place of residence, population aged 65 or older, Canada excluding territories, 1996/97



Data source: *1996/97 National Population Health Survey, cross-sectional sample, Health and Institutional files*
Note: *Adjusted for age and sex; standardization of curves of residents of long-term health care facilities, compared with age and sex structure of residents of private households*

Chart 2
Mean scores of components of Health Utilities Index, by disability level and place of residence, population aged 65 or older, Canada excluding territories, 1996/97



Data source: *1996/97 National Population Health Survey, cross-sectional sample, Health and Institutional files*
Note: *Adjusted for age and sex; standardization for various attributes for residents of long-term health care facilities, compared with age and sex structure of residents of private households*
** Significantly different from residents of private households, $p \leq 0.01$*

component of the HUI was much lower (designating worse health for that component) for those in institutions than for those in private households, while the pain component was lower for those in private households. Painful illnesses such as arthritis do not necessarily lead to institutionalization, but the daily dependence brought on by cognitive illnesses such as Alzheimer's disease almost always mandates it.

The presence of elderly people with no disability in long-term health care facilities cannot be primarily attributed to their health status. The average scores of this group on the various components of the HUI were relatively high, compared with people with moderate or severe disability. This suggests that, for some elderly people, factors other than health status (as measured by the HUI) are associated with institutionalization.

Health Utilities Index

The Health Utilities Index (HUI), which was developed by the Centre for Health Economics and Policy Analysis (CHEPA) at McMaster University, summarizes the quantitative and qualitative aspects of health. It is based on the Comprehensive Health Status Measurement System (CHSMS),[14] a descriptive measure of an individual's overall functional health. The functional component is determined by asking respondents about eight areas of their personal health: vision, hearing, speech, mobility (ability to get around), dexterity (use of hands and fingers), cognition (memory and thinking), emotion (feelings), and pain and discomfort. Each rating by an individual on these eight health attributes is used to create an overall index, the value of which ranges between 0 and 1. For instance, vision ranges from blindness to perfect vision; a person with myopia but no other health problems would have a HUI of 0.95.

The valuation component is derived from another survey[15] that asked respondents to rank their preferences for various health conditions. Evaluation of individual preferences is complex: an individual classifies, by order of preference, all states of health corresponding to each area of health. Cardinal utilities are given through the standard gamble method,[16] based on the theory of utility assembled by Von Newmann and Morgenstern.[17]

The standard gamble method asks subjects to choose between two options. Option 1 offers a particular possibility with certainty, while Option 2 represents a gamble with explicit probabilities that can lead to two outcomes. For instance, the choice may be between having a chronic condition for life (Option 1), and an intervention that would allow the patient to regain his or her health and live t more years (probability p), but which could also cause his or her immediate death (probability 1-p) (Option 2).

Each individual rating on each of the functional dimensions is weighted by the valuation component to yield an overall HUI for each individual. The HUI ranges from 0.00 to 1.00, with 1.00 representing perfect health.

The HUI is one of the variables available from the National Population Health Survey (NPHS). The NPHS index consists of six, rather than eight, areas of health: vision, hearing and speech are grouped into "senses." Based on the questions on vision, hearing, speech, mobility, emotion, cognition, dexterity and pain, a value was assigned to each HUI component on a scale of 0.51 to 1.00, ranging from severe disability (0.51) to perfect health (1.00).

Health Utilities Index (HUI) components and values attributed to each component based on responses to questionnaire

SENSES U1	MOBILITY U2	EMOTION U3	COGNITION U4	DEXTERITY U5	PAIN U6
1.00	1.00	1.00	1.00	1.00	1.00
0.95	0.97	0.93	0.95	0.97	0.97
0.90	0.84	0.81	0.88	0.91	0.85
0.86	0.78	0.53	0.65	0.80	0.51
0.74	0.73				
0.67					
0.61					

HUI = 1.06 ((U1*U2*U3*U4*U5*U6)-0.06)

The resulting HUI transposes a vector resulting from the multiplication of the values attributed to each of the components, then a correction factor that takes social preferences into account is added. With the minimum value of each attribute, the resulting HUI is 0; that is, 1.06*((0.61*0.73*0.53*0.65*0.80*0.51)-0.06) = 0. On the other hand, the maximum value for each attribute yields a HUI of 1; that is, 1.06*((1*1*1*1*1*1)-0.06) = 1.

Analysts at Statistics Canada have subjected the HUI to coherence tests and consider that it provides a realistic evaluation of the functional health status of the population. A detailed explanation of the calculation of the HUI is available in another report.[18]

Characteristics differ

Predictably, the characteristics of residents of long-term health care facilities differed from those of seniors in private households.

At each level of disability, residents of long-term health care facilities had a lower average Health Utilities Index score than did their counterparts in private households (Table 1). As well, the average age of institutional residents was higher than that of people in private households. The gap, however, was widest—about 10 years—among those reporting no disability.

At older ages, women account for a progressively larger share of the population. Even so, the female majority was much more pronounced in institutions than in private households. To a large extent, this

Table 1
Socio-demographic and health characteristics of population aged 65 or older, by disability level and place of residence, Canada excluding territories, 1996/97

	Residents of long-term health care facilities			Residents of private households		
	Total	Men	Women	Total	Men	Women
Severe disability						
Average Health Utilities Index	0.40*	0.41*	0.40*	0.52	0.55	0.50
Average age (years)	84.0*	81.1*	85.1*	79.1	77.7	80.2
Sex distribution (%)						
Men	26.3*	...	...	42.2	...	...
Women	73.7*	...	...	57.8	...	...
Marital status distribution (%)						
Married/Common-law	18.4*	38.9*	11.1*	50.2	73.5	33.3
Widowed	64.3*	36.4*	74.2*	39.3	16.4	55.9
Separated/Divorced	2.6	4.9	1.8	4.1	3.0	5.0
Single	14.1*	18.6*	12.5*	6.2	7.1	5.5
Missing	0.6	1.2	0.4	0.2	–	0.3
Moderate disability						
Average Health Utilities Index	0.64*	0.66*	0.64*	0.77	0.77	0.76
Average age (years)	82.8*	78.4*	84.5*	74.6	74.4	74.8
Sex distribution (%)						
Men	28.2*	...	...	43.9	...	...
Women	71.8*	...	...	56.1	...	...
Marital status distribution (%)						
Married/Common-law	10.3*	24.1*	4.9*	56.7	77.7	40.3
Widowed	67.4*	43.1*	76.9*	33.1	13.7	48.2
Separated/Divorced	7.9	16.2	4.6	5.1	4.4	5.7
Single	13.5*	14.9	13.0	5.0	4.2	5.7
Missing	0.9	1.7	0.6	0.1	–	0.1
No disability						
Average Health Utilities Index	0.80*	0.84*	0.78*	0.91	0.91	0.91
Average age (years)	82.2*	79.3*	83.5*	72.6	72.5	72.6
Sex distribution (%)						
Men	31.1*	...	...	43.0	...	...
Women	68.9*	...	...	57.0	...	...
Marital status distribution (%)						
Married/Common-law	10.2*	15.6*	7.8*	60.1	74.8	48.9
Widowed	65.7*	41.1*	76.8*	27.7	13.6	38.3
Separated/Divorced	6.4	13.0	3.4	6.5	5.9	7.0
Single	17.7*	30.3*	12.0	5.5	5.5	5.6
Missing	–	–	–	0.2	0.2	0.2

Data source: *1996/97 National Population Health Survey, cross-sectional sample, Health and Institutional files*
... Not applicable
– Nil
** Significantly different from residents of private households, $p \leq 0.01$*

imbalance reflects higher male mortality, especially at older ages.

As a result, among the elderly, women are more likely than men to be widowed. And while the proportion of both widows and widowers was much higher in institutions than in private households, this was particularly the case for women. Since elderly women frequently have no spouse, the likelihood that they will receive personal assistance at home is reduced, and institutionalization may be necessary. Men, on the other hand, are more likely to live with a spouse, and hence, to receive help at home.

Multivariate analysis

The differences in the characteristics of seniors in long-term health care facilities and private households suggest that, along with health status, personal characteristics such as age, sex and marital status may be associated with living in institutions. As well, previous research has shown that education and income may play a role.[19,20] Of course, many of these variables tend to be related. For instance, people with high educational attainment often have higher incomes, and the incomes of women who are widowed may be limited. The association of each of these factors with the presence of seniors in institutions can best be determined through multivariate analysis.

Andersen's conceptual framework,[21] which defines the use of health care services as being a function of predisposing factors, enabling factors and individual need factors, is helpful in analyzing the variables associated with the institutionalization of elderly people. Predisposing factors are socio-demographic characteristics such as age, sex, marital status, and education. Enabling factors represent individual or community resources; income, for example, can influence access to health care services. Need factors refer to health problems that generate a demand for care, such as chronic conditions or activity restrictions.

An overall comparison of seniors in long-term health care facilities with those in private households reveals the predisposing, enabling and need factors that were significantly associated with institutionalization.

Age stood out among the predisposing factors. The odds were significantly high that people aged 80 or older would be institutionalized, compared with those who were in their sixties (Table 2). As well, seniors who were single, widowed or divorced/separated had significantly higher odds of residing in such a facility than did those who were married. Education, too, was significant, with high odds of institutionalization among people with primary school or less, compared with postsecondary graduates. However, when these predisposing factors, along with enabling and need factors were taken into account, women's odds of living in a long-term care facility were statistically no greater than those of men.

Income, the only enabling factor considered in this analysis, was significant, with higher odds of institutionalization among seniors with two or fewer sources of income than among those with three or more sources. This suggests that elderly people who are better off financially are at less risk of being in

Limitations

Ideally, the transition to institutional living should be studied longitudinally. However, after age 65 very few people (about 6 individuals in the sample) move out of long-term health care facilities to live elsewhere, and the number in the sample who moved from private households to institutions (fewer than 50) was not large enough to analyze. Thus, this analysis, like most research on the population living in institutions in Canada, is based on cross-sectional data.

The questions asked of residents of long-term health care facilities differed slightly from those asked of private household residents. As well, the information for over half of respondents in institutions (and for almost three-quarters with a severe disability) was provided by proxy (Appendix Table B).

Respondents were asked if a health professional had diagnosed them as having selected chronic conditions. However, no information is available about the severity of those conditions.

Some important variables that might discriminate between moderately/severely disabled seniors who remain at home and those who are institutionalized are not available for the institutional population: for example, availability of informal support.

Table 2
Adjusted odds ratios for residence in long-term health care facility, by disability level, population aged 65 or older, Canada excluding territories, 1996/97

	Total		Severe disability		Moderate disability		No disability	
	Odds ratio	99% confidence interval	Odds ratio	99% confidence interval	Odds ratio	99% confidence interval	Odds ratio	99% confidence interval
Predisposing factors								
Age								
65-69†	1.00	...	1.00	...	1.00	...	1.00	...
70-74	1.21	0.68, 2.13	1.16	0.47, 2.82	0.90	0.32, 2.53	1.24	0.31, 4.96
75-79	1.45	0.83, 2.53	1.21	0.51, 2.84	1.14	0.40, 3.20	1.59	0.41, 6.17
80-84	2.52*	1.45, 4.36	1.79	0.76, 4.20	1.60	0.59, 4.36	5.04*	1.44, 17.62
85 or older	4.96*	2.94, 8.38	2.55*	1.14, 5.74	6.43*	2.65, 15.64	17.89*	5.44, 58.87
Marital status								
Married/Common-law†	1.00	...	1.00	...	1.00	...	1.00	...
Widowed	3.81*	2.57, 5.63	2.51*	1.51, 4.16	6.31*	2.62, 15.22	8.14*	2.52, 26.27
Separated/Divorced	4.18*	2.11, 8.28	2.06	0.72, 5.92	11.90*	3.53, 40.09	8.07*	1.56, 41.82
Single	7.59*	4.63, 12.45	6.40*	3.21, 12.77	13.07*	4.53, 37.70	17.31*	4.68, 64.08
Sex								
Women†	1.00	...	1.00	...	1.00	...	1.00	...
Men	0.85	0.61, 1.18	0.57*	0.36, 0.90	0.89	0.48, 1.67	0.91	0.42, 1.98
Education								
None	4.31*	1.95, 9.52	1.87	0.73, 4.76	5.89*	1.34, 25.81	15.33*	2.13, 110.16
Primary	2.06*	1.35, 3.14	1.51	0.86, 2.64	3.45*	1.45, 8.19	2.52	0.83, 7.69
Some high school	0.89	0.56, 1.42	0.77	0.41, 1.44	1.34	0.52, 3.46	1.23	0.37, 4.03
High school graduation	1.18	0.70, 2.00	0.96	0.47, 1.95	1.44	0.48, 4.35	2.55	0.78, 8.28
Some postsecondary	0.74	0.40, 1.36	0.96	0.42, 2.18	0.88	0.27, 2.83	0.31	0.04, 2.10
Postsecondary graduation†	1.00	...	1.00	...	1.00	...	1.00	...
Enabling factor								
Income								
Single source‡	1.68*	1.14, 2.49	2.40*	1.42, 4.05	0.87	0.39, 1.95	1.57	0.63, 3.91
Two sources	1.56*	1.11, 2.18	1.75*	1.11, 2.73	1.11	0.58, 2.11	1.11	0.48, 2.54
Three or more sources†	1.00	...	1.00	...	1.00	...	1.00	...
Need factors								
Dependency								
Not dependent†	1.00	...	...	...	...	...	...	...
Dependent: personal care and transportation	9.55*	6.35, 14.37	...	...	...	...	...	...
Dependent: personal care only	12.57*	8.35, 18.94	...	...	...	...	...	...
Dependent: transportation only	0.51	0.17, 1.57	...	...	...	...	...	...
Activity restrictions§	1.35	0.92, 1.97	...	...	...	...	...	...
Chronic conditions††								
Alzheimer's disease or other dementia	9.33*	6.08, 14.30	7.00*	4.44, 11.04	12.23*	4.24, 35.32	44.92*	9.59, 210.27
Urinary incontinence	4.94*	3.58, 6.82	6.40*	4.30, 9.52	3.03*	1.56, 5.88	4.12*	1.46, 11.63
Ulcers	0.09*	0.02, 0.32	0.23	0.04, 1.29	0.17	0.01, 2.09	0.10	0.00, 11.06
Arthritis	0.62*	0.46, 0.84	0.45*	0.30, 0.66	0.70	0.40, 1.23	0.92	0.45, 1.86
Effects of stroke	1.86*	1.24, 2.77	1.92*	1.23, 2.97	1.56	0.59, 4.08	2.09	0.42, 10.30
Bowel disorders	0.34*	0.16, 0.73	0.30*	0.13, 0.67	0.35	0.06, 2.03	0.65	0.06, 7.29
High blood pressure	0.51*	0.37, 0.71	0.52*	0.34, 0.80	0.53	0.28, 1.00	0.52	0.23, 1.20
Bronchitis or emphysema	1.29	0.80, 2.09	1.14	0.63, 2.09	1.22	0.51, 2.93	1.75	0.48, 6.44
Epilepsy	2.13	0.81, 5.59	1.82	0.52, 6.41	2.21	0.42, 11.60	1.08	0.01, 190.83
Heart disease	0.74	0.52, 1.05	0.63*	0.41, 0.95	0.85	0.43, 1.65	1.69	0.72, 3.95

Data source: *1996/97 National Population Health Survey, cross-sectional sample, Health and Institutional files*
Notes: *Dependency cannot be tested by disability level, since activity restrictions and dependency are used to establish disability levels. Everyone with severe disability is restricted and dependent whether in private households or in long-term health care facilities. Odds ratios would, therefore, always be 1.00.*
† Reference category, for which odds ratio is always 1.00
‡ Includes no source of income.
§ Reference category is absence of condition.
†† Diagnosed by a health professional; reference category is absence of condition.
** $p \leq 0.01$*
... Not applicable

a long-term health care facility, possibly because they have the means to pay for the help they need.[2]

Not surprisingly, several need factors increased the odds of institutionalization for elderly people. Dependency for personal care and chronic conditions, notably Alzheimer's disease or other dementia, urinary incontinence and the effects of stroke, were significantly associated with living in an institution.

While an overall comparison of seniors in long-term health care facilities with those in private households is helpful in explaining institutionalization, an analysis of elderly people with the same level of disability is more useful in revealing the factors associated with their place of residence.

Severe disability

In 1996/97, an estimated 135,100 elderly people with severe disability lived in long-term health care facilities. But far more with severe disability were living in private households—230,700 (Appendix Table A) .

Predictably, for elderly people with severe disability, need factors and enabling factors (that is, chronic conditions associated with a high level of dependency and few sources of income) were strongly associated with institutionalization, even when other potentially confounding variables were taken into account. This is not unexpected, since a severe disability dominates all other factors in accounting for residence in a long-term health care facility.[13] The odds of institutionalization among severely disabled elderly people were very high for those with Alzheimer's disease or other dementia or with urinary incontinence, and were also significantly elevated for those suffering the effects of stroke, compared with seniors who were not affected by these conditions (Table 2).

Age was significantly associated with institutionalization among seniors with severe disability. At age 85 or older, the odds that severely disabled seniors would live in an institution were about two and a half times the odds for those aged 65 to 69.

Being single or widowed, as opposed to married, was significantly associated with residence in a long-term health care facility for seniors with severe disability. As well, men had significantly low odds of living in an institution, compared with women. This may reflect the fact that men are less likely to be widowed or to reach very advanced ages.

High odds of institutionalization among elderly people with few sources of income indicate that those with the financial means to do so will remain at home, even when extremely debilitating conditions such as Alzheimer's disease or urinary incontinence are taken into account.

The significantly low odds of institutionalization associated with ulcers, arthritis, bowel disorders, and high blood pressure are unexpected, as it is unlikely that these conditions actually reduce the risk of being in a long-term care facility. These findings may be an effect of proxy reporting. Fully 73% of severely disabled seniors in long-term health care facilities answered the NPHS by proxy (Appendix Table B). Under-reporting of conditions such as arthritis and ulcers may explain the low odds ratios. This appears to be corroborated by the fact that a higher proportion of residents of institutions who had severe disability and who answered the questions themselves reported such health problems than did those who responded by proxy (for example, 7.9% versus 5.7% for ulcers). It is likely, then, that ulcers, arthritis, high blood pressure, and bowel diseases may tend to go unnoticed among people suffering more severe conditions such as Alzheimer's disease.

Moderate disability

Only about 28,700 seniors with moderate disability lived in long-term health care facilities in 1996/97, whereas 934,100 with this level of disability were in private households (Appendix Table A).

The presence of seniors with moderate disability in long-term health care facilities was associated with many of the same factors as for those with severe disability. For instance, the odds of institutionalization were high for people aged 85 or older, compared with 65- to 69-year-olds, and among those with Alzheimer's disease or other dementia or with urinary incontinence (Table 2).

In addition to being single or widowed, being separated or divorced was associated with higher odds of institutionalization for seniors with moderate disability, compared with their counterparts who were married. As well, those with primary school or no formal education had higher odds of living in a long-term care facility than did those with postsecondary credentials.

For seniors with moderate disability, the number of income sources was not significantly associated with institutionalization.

No disability

As might be expected, few seniors who reported that they were free of disability lived in long-term health care facilities in 1996/97—just 17,400 (Appendix Table A). For this small group, residence in such a facility was associated with two chronic conditions: Alzheimer's disease or other dementia and urinary incontinence (Table 2). The characterization of people with dementia as having "no disability" seems illogical. However, because dementia is degenerative and begins with short-term memory loss, in the early stages individuals are not necessarily at a severe level of disability, as defined in this analysis.

Predisposing factors were also significantly associated with the institutionalization of elderly people with no disability. Both the 80-to-84 and 85-and-older age groups had significantly high odds of living in a long-term care facility, compared with 65- to 69-year-olds. As well, compared with those who were married, seniors with no disability who were single, widowed, or separated/divorced had significantly high odds of living in an institution. Also, seniors with no formal education had higher odds of institutionalization than did postsecondary graduates. However, the number of income sources was not significantly associated with institutionalization for seniors with no disability.

Perhaps most paradoxical was that over a million seniors with severe or moderate disability lived in private households, while at the same time, 17,400 individuals with no disability lived in long-term care facilities (Appendix Table A). The presence in institutions of seniors with no reported disability was not associated with chronic conditions or the number of income sources (Table 3). Predisposing factors seemed to make the difference, notably, advanced age and lack of a spouse.

Table 3
Adjusted odds ratios, population aged 65 or older with no disability in long-term health care facility compared with severe/moderate disability in private households, Canada excluding territories, 1996/97

	Odds ratio	99% confidence interval
Predisposing factors		
Age		
65-69†	1.00	...
70-74	1.17	0.29, 4.67
75-79	1.50	0.38, 5.89
80-84	3.25	0.95, 11.17
85 or older	5.00*	1.53, 16.37
Marital status		
Married/Common-law†	1.00	...
Single	14.04*	3.96, 49.74
Widowed	6.70*	2.21, 20.27
Separated/Divorced	12.08*	2.44, 59.89
Sex		
Women†	1.00	...
Men	0.89	0.43, 1.86
Education		
None	2.68	0.43, 16.71
Primary	2.85	0.98, 8.23
Some high school	1.63	0.51, 5.17
High school graduation	3.75*	1.19, 11.85
Some postsecondary	0.55	0.08, 3.62
Postsecondary graduation†	1.00	...
Enabling factor		
Income		
Single source‡	2.01	0.83, 4.87
Two sources	1.29	0.58, 2.85
Three or more sources†	1.00	...
Need factors		
Chronic conditions††		
Alzheimer's disease or other dementia	2.13	0.65, 7.02
Urinary incontinence	1.41	0.56, 3.58
Ulcers	0.26	0.01, 13.04
Arthritis	0.31*	0.16, 0.62
Effects of stroke	0.48	0.11, 2.04
Bowel disorders	0.28	0.03, 2.81
High blood pressure	0.46	0.20, 1.04
Bronchitis or emphysema	0.81	0.24, 2.70
Epilepsy	0.10	0.00, 15.33
Heart disease	0.73	0.32, 1.65

Data source: *1996/97 National Population Health Survey, cross-sectional sample, Health and Institutional files*
† Reference category, for which odds ratio is always 1.00
‡ Includes no source of income.
§ Reference category is absence of condition.
†† Diagnosed by a health professional; reference category is absence of condition.
** $p \leq 0.01$*
... Not applicable

Concluding remarks

According to the 1996/97 National Population Health Survey, health-related factors, notably, debilitating chronic conditions such as Alzheimer's disease, urinary incontinence and the effects of stroke, were strongly associated with whether or not a senior lives in a long-term health care facility. In fact, the majority (75%) of people aged 65 or older in long-term health care facilities had a severe disability, whereas most elderly people in private households had no disability (66%). Since Alzheimer's disease or other forms of dementia seem to be one of the most important determinants of institutionalization, it follows that medical advances in this field and progress in the treatment and management of this condition might contribute to reducing the numbers in long-term health care facilities in the future. A greater supply of and more appropriate home care for those afflicted with dementia might also reduce the demand for long-term care now as well as in the future.

However, a substantial number of seniors with no disability were residents of long-term health care institutions, while close to a quarter million with severe disability lived in private households. Therefore, considerations beyond health status can influence whether an individual senior will continue to live in a private household. This analysis of NPHS data shows that age, marital status and income are among the factors associated with institutionalization of the elderly. Again, the availability of provincial home care programs that provide services to seniors may play a role.[22]

Except among those with severe disability, being female was not, per se, a risk factor for institutionalization. It was the other characteristics of elderly women—advanced age, lack of a spouse, and few sources of income—that contributed to the preponderance of women among residents of long-term health care facilities.

The absence of a spouse was clearly related to institutionalization among elderly people, especially those with no disability. Eventually, the death of a spouse is inevitable for one partner of a married couple. The narrowing gap in life expectancy between men and women[23] could substantially reduce the time elderly people, particularly women, spend without a partner. Nonetheless, the high divorce rate in recent years might mean an increase in the number of people living without a spouse.

Even when other variables were taken into account, advanced age was independently associated with the institutionalization of elderly people. Rising life expectancy and the projected increase in the number of Canadians in their eighties and older[4] suggest that the need for long-term care beds could grow in the future.

A related demographic trend, declining family size, could also have some effect on the need for long-term health care facilities. A number of studies[9,24,25] have shown that the presence of children (especially daughters) as a source of help at home may prevent, or at least postpone, institutionalization. (See *Changes in social support in relation to seniors' use of home care* in this issue.) With fewer children available to provide such support in the future, the need for institutionalization might increase.

The rising incomes of seniors[26] may permit more and more elderly people to avoid, or at least delay, institutionalization in coming years. And as a result of the growing labour force participation of women,[27] in the future a larger share of senior women will have income from savings, investments and pensions from employment than is the case today.

Thus, while major demographic changes in the short- and medium-term have implications for health care policies directed toward the elderly, social and economic factors will also influence the need for various levels of care. ●

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Appendix

Table A
Sample size, weighted counts and distribution of population aged 65 or older, by place of residence, National Population Health Survey, 1996/97

	Residents of long-term health care facilities			Residents of private households		
	Sample size	Weighted count		Sample size	Weighted count	
		'000	%		'000	%
Total	**1,674**	**181.2**	**100.0**	**13,337**	**3,403.8**	**100.0**
Severe disability (activity limitation *and* dependence)	1,238	135.1	74.5	889	230.7	6.8
Moderate disability (activity limitation but *no* dependence or dependence but *no* limitation)	267	28.7	15.9	3,702	934.1	27.4
No disability (no limitation *and* no dependence)	169	17.4	9.6	8,746	2,239.1	65.8

Data source: *1996/97 National Population Health Survey, cross-sectional sample, Health and Institutional files*
Note: *Total excludes missing values.*

Table B
Percentage of proxy responses, by disability level and place of residence, National Population Health Survey, 1996/97

Disability level	Long-term health care facilities	Private households
	%	%
Total	**59.2**	**18.3**
Severe	73.3	31.7
Moderate	28.8	17.3
No disability	6.5	17.3

Data source: *1996/97 National Population Health Survey, cross-sectional sample, Health and Institutional files*
Note: *Unweighted counts based on sample of 1,674 residents of institutions and 13,337 residents of private households.*