Long-Term-Care Residents

Concerns Identified by Population and Care Trends

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ABSTRACT

Background: Despite an abundance of data and analysis of First Nations morbidity and mortality rates, accurate data have not been available to serve the First Nations community in Eastern Canada.

Methods: Data for Eskasoni, the largest Mi'kmaq community, were obtained for 1996 through 1999 and Cape Breton and Nova Scotia were used as regional and provincial reference populations respectively. Age-adjusted relative risks (AARR) were calculated for overall mortality and disease-specific hospital admissions.

Results: Eskasoni's mortality AARR was greater than 1.0 in 3 of the 4 years studied, although the data may understate Eskasoni's mortality rates. Eskasoni's total admission AARRs were significantly greater than the two reference populations. Neoplasm admission rates were generally lower, while circulatory disease admission AARRs were significantly higher. A rise in diabetic admission rates was noted with the AARR reaching statistical significance in the final years of the study. Respiratory disease was the leading cause of hospitalization with significantly greater rates of admission than regional or provincial rates. Pneumonia and influenza accounted for more than one half of respiratory admissions. Infectious disease admissions were more prevalent in Eskasoni while rates of liver disease were generally low.

Conclusion: Results suggest that members of the largest Mi'kmaq band are at greater risk for a number of disease categories and health promotion should be targeted toward respiratory ailments, circulatory disease and diabetic management. Further analysis, however, remains an important priority.

La traduction du résumé se trouve à la fin de l'article.

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Despite widespread concern over population aging, few research reports describe the people who are the oldest and most dependent, those requiring long term facility-based care (LTC). Past research has shown LTC residents are typically advanced in age and afflicted by a number of often chronic illnesses.¹⁻¹¹ Dementia is a common health problem.¹²⁻¹⁵

Although helpful, past research is limited as a consequence of self-report data, cross-sectional data, 1970/80s data, and data from a single or small number of facilities. With few exceptions,¹⁶ trends have not been the focus of attention. As such, it is difficult to determine if this population is growing, or changing as a result of population aging or other trends and events. Minimal information is therefore available to address an important dilemma – how to provide for an increasingly larger senior population? To address this gap, a research investigation was undertaken to describe LTC population socio-demographic and care trends.

RESEARCH METHODOLOGY

In 1988, after considerable planning and pilot testing, Alberta Health and Wellness began to collect comprehensive data on LTC residents across Alberta. Using the Resident Classification Form, specially-trained registered nurses have collected data each fall from the charts of current residents in all nursing homes and auxiliary-care facilities, with data verification by resident caregivers. The entire Alberta Resident Classification System for Long-Term Care Facilities dataset (1988-99) was obtained upon request following research ethics approval, grant funding notification, and Ministry of Health approval of data access. To protect residents, yet preserve researcher access to individual data, each resident was assigned a unique anonymous stakeholder number (ASN) by the Ministry. Data variables were:

1. LTC facility (bed capacity, rural or urban location),
2. socio-demographic (age, sex, admission date, classification date, death date),
3. assistance with activities of daily living (ADL), including 4 specific ADL variables (eating, toileting, transferring, dressing) and 1 summary ADL score,
4. behaviours of daily living (BDL) requiring intervention, including 16 specific

- BDL variables (wandering, hoarding or rummaging, aggressive or angry, agitated, suspicious, indiscriminate ingestion of foreign substances, inappropriate smoking, inappropriate sexual behaviour, inappropriate drug/alcohol use, resists treatment/refuses care, acts sad/depressed, demands attention, is suicidal, is anxious, potential for injury, ineffective coping) and 1 summary BDL score,
5. continuing care level (CCL), including 5 specific CCL variables (urinary incontinence, bowel incontinence, orientation to facility, orientation to staff, memory of instructions) and 1 summary CCL score,
6. Composite Care Requirement (CCR), a computer-generated score that is based on an individual's ADL, BDL, and CCL scores.*

Data analysis was undertaken using descriptive and comparative tests in the SPSS (Versions 11 and 11.5) program, as appropriate for the data variables and study purpose. General linear modeling was used to identify variables responsible for a higher CCR score in the last (1999) year, as compared to the first (1988) year.

FINDINGS

Socio-demographic trends

In total, 47,510 individuals were classified over the 10-year period as LTC residents. Despite a 3.5% increase (from 12,421 in 1988 to 12,860 in 1999), this population peaked in 1992 at 13,496 persons. When compared to census figures, over time, a smaller proportion of Albertans of all ages and Alberta seniors became LTC residents (Table I). Most residents were classified more than once; with 27.9% classified twice (mode) and 2.1% classified all 12 times. As also illustrated, 2/3 of all 155,732 classifications involved females. A significantly larger proportion each year was female. Half of all classifications involved residents who lived in Edmonton or Calgary (where 2 of 3 million Albertans live). Yet, over time, a significantly larger proportion of residents lived outside of Edmonton and Calgary.

* The CCR scoring methodology was not available from the Ministry of Health. The researchers understood these scores were based on a systematic process of computing a score from the ADL, BDL and CCL scores.

TABLE I

LTC Resident Socio-demographics (1988-1999)

	All Classifications N (%)	First Year, 1988 N (%)	Last Year, 1999 N (%)	Statistical Analysis
Population of Alberta				
Total population		2,454,715 (100)	2,959,429 (100)	
Seniors only		208,469 (8.49)	294,452 (9.95)	
LTC Residents as a Proportion of Alberta Population				
Total population		12,421 (0.51)	12,860 (0.44)	
Seniors only		11,264 (5.4)	12,127 (4.1)	
Sex				
Male	50,963 (32.8)	4,284 (34.7)	4,057 (31.6)	*
Female	104,701 (67.2)	8,115 (65.3)	8,802 (68.4)	
Residence				
Urban	88,757 (57.0)	7,574 (59.4)	7,124 (55.4)	*
Rural	66,975 (43.0)	5,047 (40.6)	5,236 (44.6)	
Admission Age				
<65 years	18,109 (11.6)	1,651 (13.3)	1,202 (9.3)	
65+ years	137,537 (88.4)	10,746 (86.7)	11,657 (90.7)	*
Mean (range)	78.1 (1-107)	77.4 (7-107)	79.2 (5-104)	t
Age at Classification				
<65 years	11,681 (7.5)	1,134 (9.1)	732 (5.7)	
65+ years	143,974 (92.5)	11,264 (90.9)	12,127 (94.3)	*
Mean (range)	81.4 (1-111)	80.5 (9-111)	82.5 (11-107)	t
Age at Death				
Mean (range)	85.6 (1-111)	85.5 (2-111)	85.5 (13-106)	NS

* = significant difference over time in proportions (χ^2 , df=11, p=0.000 in all instances)

t = significant difference over time in mean scores (ANOVA, p=0.000 in all instances)

NS = Not Significant

TABLE II

Composite Care Requirement (CCR) Score Distributions

CCR Scores	Number (%) of Residents, 12 Years Combined	Number (%) of Residents at First Classification, 1988	Number (%) of Residents at Last Classification, 1999
A (lowest)	4,310 (2.8)	1,238 (10.0)	26 (0.2)
B (lower)	25,157 (16.2)	3,096 (24.9)	1,275 (9.9)
C (low medium)	14,579 (9.4)	1,295 (10.4)	1,034 (8.0)
D (medium)	19,131 (12.3)	1,294 (10.4)	1,877 (14.6)
E (medium high)	26,566 (17.1)	1,914 (15.4)	2,271 (17.7)
F (higher)	50,961 (32.7)	3,194 (25.7)	5,025 (39.1)
G (highest)	14,757 (9.5)	287 (2.3)	1,352 (10.5)
Missing data	281 (0.2)	103 (0.9)	0 (0.0)
Total Classified	155,732 (100)	12,421 (100)	12,860 (100)
Mean CCR score	4.61	3.83*	5.0*
Median	5	4	5
Mode	6	4	6
SD	1.72	1.84	1.48
Range	1-7	1-7	1-7

Note: String variables (A-G) were converted to numeric variables (1-7) for analysis purposes

* significant trend of increased mean scores over 12 years (Pearson's $r=0.221$, p=0.000)

In 1999, 157 facilities housed from 5 to 419 residents. Two (1.2%) had 300+ residents, 8 (5.1%) had 200-299 residents, 39 (24.8%) had 100-199 residents, and 108 (68.8%) had under 100 residents. Yet, 66.7% of residents lived in 100+ bed facilities. All facilities providing care for <47 residents were located outside of Edmonton and Calgary; 34 of 49 Edmonton and Calgary facilities housed 100+ residents.

Most classifications involved residents who were 65+ years of age when admitted (Table I). Over time, a significantly larger proportion were seniors when admitted. The average age at admission also increased

significantly over time. Similarly, most annual classifications involved residents aged 65+, with a significantly larger proportion over time aged 65+. The average age of residents also increased significantly over time. Female residents were significantly older than male residents over all years combined (82.8 and 78.6 respectively, $t=69.264$, $df=155,653$, $p=0.000$) and each separate year (t tests, $p=0.000$). Rural residents were significantly older than urban residents in all years combined (82.4 and 80.7 respectively, $t=29.381$, $df=155,653$, $p=0.000$) and each separate year (t tests, $p=0.000$).

TABLE III
Care Needs Score Distributions (1988-1999)

Measure	All 12 Years Combined	First (1988) Classification	Last (1999) Classification	Pearson's r value (probability)
Summary ADL				
Mean score	3.67	3.12	3.98	0.195 (0.000)*
Median	4.00	3.00	4.00	
Mode	5	5	5	
SD (range)	1.4 (1-5)	1.53 (1-5)	1.23 (1-5)	
Summary BDL				
Mean score	2.52	1.94	2.81	0.321 (0.000)*
Median	3.00	2.00	3.00	
Mode	3	1	3	
SD (range)	0.86 (1-4)	0.88 (1-4)	0.67 (1-4)	
Summary CCL				
Mean score	1.65	1.42	1.77	0.106 (0.000)*
Median	2.00	1.0	2.00	
Mode	3	0	3	
SD (range)	1.18 (0-3)	1.28 (0-3)	1.12 (0-3)	

* significant correlations (involving all scores over 12 years)

TABLE IV
Care Scores Compared on the Basis of Age, Region, Facility Size, and Sex

	CCR Test Value (probability)	ADL Test Value (probability)	BDL Test Value (probability)	CCL Test Value (probability)
Age				
0-64	-0.070	-0.064	-0.058	-0.070
65+	(0.007)*	(0.000)*	(0.000)*	(0.000)*
Age	0.000	0.025	-0.078	0.075
Raw score	(NS)	(0.000)*	(0.000)*	(0.000)*
Region	589.994	316.832	540.178	296.419
Urban	df=6	df=4	df=3	df=3
Rural	(0.000)t	(0.000)t	(0.000)t	(0.000)t
Facility Size				
Small (<100)	0.053	0.032	0.075	0.021
Large (100+)	(0.000)*	(0.000)*	(0.000)*	(0.000)*
Facility Size	0.098	0.067	0.106	0.048
Actual beds	(0.000)*	(0.000)*	(0.000)*	(0.000)*
Sex				
Male	58.900, df=6	91.724, df=4	46.346, df=3	54.240, df=3
Female	(0.000)t	(0.000)t	(0.000)t	(0.000)t

t = significant difference in proportions (Chi square test)

* = significant correlation (Spearman's rho test)

NS = Not Significant

In total, 33,296 deaths were recorded (70.0% of residents). The average age at death was 85.6 years (Table I), with no change over time in this average ($F=0.289$, $df=11$, $p=0.988$). The average length of stay from admission to death was 5.7 years. Over time, the average stay decreased significantly ($F=489.516$, $df=11$, $p=0.000$), from 6.9 years for residents who died in the year following the 1988 fall classification to 3.4 years for residents who died in the year following the 1999 fall classification. A significant negative correlation between classification years and length of stay was found (Pearson $r=-0.216$, $p=0.01$).

Care trends

The average CCR score increased significantly over time from low-medium (or C level) care to medium-high (or E level) care (Table II). CCR variance among residents

was noted, although this variance declined over time. In 1988, 45.3% had the three lowest scores and 43.4% had the three highest; by 1999, 18.1% had the three lowest scores and 67.3% had the three highest.

Increasing care needs were also illustrated by trend data for other summary measures and all but two specific ADL, BDL, or CCL measures (Table III). Inappropriate smoking (Spearman's $\rho=-0.032$, $p=0.000$) and alcohol/drug abuse (Spearman's $\rho=-0.006$, $p=0.000$) declined over time.

As shown in Table IV, residents under age 65 had significantly higher care scores than those aged 65+. Yet, when raw age was tested, aging was associated with higher needs in 3 of 4 summary measures. Similarly, rural residents had significantly higher scores, yet residents with higher needs were more often situated in larger

urban (Edmonton or Calgary) facilities. Females had significantly higher care scores by all measures.

General linear modeling was used to identify significant and non-significant variables to explain in part the higher CCR score found in the last year (1999) as compared to the first (1988) year. The dependent variable was the CCR score, with younger/older age, urban/rural facility location, smaller/larger LTC facility, and male/female gender the independent variables. Gender was not significant ($F=1.097$, $p=0.295$), while younger age ($F=31.125$, $p=0.000$), urban location ($F=247.612$, $p=0.000$), and larger LTC bed capacity ($F=325.323$, $p=0.000$) were.

DISCUSSION AND IMPLICATIONS

This study identified a substantial increase in care needs among Alberta's LTC residents between 1988 and 1999. Residents also varied in their care needs, although this variance became less pronounced over time, as 1 in 5 residents in 1999 had lower care needs compared to 1 in 2 in 1988. Unfortunately, the dataset did not contain medical diagnosis, marital status, income, education, or other factors to indicate if residents with low needs were admitted for social reasons; a conclusion of other research.^{3,17-21} A few behavioural or health problems, such as dementia and stroke, have also been identified in the past as predictive of LTC admission.^{5,22} Although this study found the LTC population was increasingly comprised of persons needing much assistance with activities of daily living and more intervention for difficult behaviours, additional research on the predictors and circumstances leading to admission is required, particularly as home care recipients could have similar care needs.²³ Research should help distinguish when assistance with aging-in-place or institutionalization is warranted.^{24,25} Given concerns about reduced access and variable access to LTC in Alberta and other provinces, research on admission standards would also be beneficial.²⁶

Rising care needs is in keeping with other research showing LTC residents typically suffer from ill health.^{5,11} Higher needs raises a number of issues, including optimal facility size. Although quality of care and quality of life in LTC may depend on

many factors,^{3,27} facility size could influence the range and quality of services. Some research on quality of life and quality of care in LTC has been conducted,^{2,28-33} yet facility size has not been studied.

Increased care needs and a reduced proportion of Alberta seniors residing in LTC facilities are outcomes of government policy to increase LTC efficiency by reducing LTC beds from a ratio of 55:1000 seniors to 50:1000.^{34,35} The intended purpose of this policy was apparently attained, as residents with lower care needs declined considerably, as did length of stay. This policy does not appear to be confined to Alberta, as a national survey established stasis during the 1990s in the size (N=186,000) of Canada's LTC resident population.⁵ An alternate explanation is that there is less demand for LTC, as more chronically ill and dependent persons have been able to remain at home as a result of home care, supportive living, and other community-care options.^{24,25,36,37} At the same time, rising informal caregiver burden could be an outcome of reduced LTC access.²³ The use of acute care hospitals by persons awaiting LTC is another concern, with Ontario responding to this and other concerns by planning to open 20,000 additional LTC beds.³⁸

The higher acuity of LTC residents also brings workforce planning into focus. One concern is the need for greater educational and other supports for staff who care for an increasingly ill, demented, and/or dying LTC population.^{6,39,40} Quality end-of-life care has already been identified as an issue by investigations of dying in LTC.⁴¹⁻⁴⁵ A related concern is ensuring a match between LTC resident needs and staff qualifications, as well as adequate staffing ratios and patient care hours to meet resident needs. LTC workforce issues have already been raised in a considerable number of studies.^{28,29,32,43,46-50} Workforce issues are likely to become more pronounced, as the replacement of licensed nurses with less-qualified staff and reduced patient care hours appear to be common LTC trends across Canada.²³

Another concern with rising acuity is the design of LTC facilities. LTC facilities are increasingly providing care for bedridden or wheelchair-bound residents, who are often incontinent, dependent upon others for feeding and dressing, and in need of

security and safety precautions. Small facilities may be considerably challenged to adapt.⁵¹ Planning new or expanded facilities is a related issue, with long-range forecasting needing to factor in extensive ongoing urbanization.⁵²

Although rising acuity was evident, so too was considerable variance among residents. One of the more surprising findings was that although this population is aging and predominantly comprised of persons who have reached advanced old age, residents under age 65 had higher care needs. This indicates disability, and not age, should be a key consideration in policy-making. This also illustrates the imperative to promote healthy aging and thus reduce the need for LTC, as well as the imperative for better management of existing health problems in younger persons.^{23,53}

CONCLUSION

This investigation of Alberta's LTC resident and care trends over 12 years indicates considerable change has occurred within this population. One of the most important changes has been a substantial increase in care needs. Rising acuity brings a number of issues, including LTC facility and workforce planning, into sharp focus. Although this study may only confirm what is suspected about this and other LTC populations across Canada, it should raise discussion over the impact of LTC bed stasis on families, community-based health services, and acute care hospitals. As such, it should serve to focus attention on LTC policy – past, present, and future.

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RÉSUMÉ

Contexte : Malgré une foule de données et d'analyses de la morbidité et des taux de mortalité des Premières Nations, on ne dispose pas de données précises pour servir les communautés des Premières Nations dans l'est du Canada.

Méthode : Des données pour Eskasoni, la plus grande communauté mi'kmaq, ont été obtenues pour les années 1996 à 1999, et les populations du cap Breton et de la Nouvelle-Écosse ont été employées respectivement comme populations de référence régionale et provinciale. Les risques relatifs ajustés selon l'âge (RRAA) ont été calculés pour les taux de mortalité généraux et pour les hospitalisations dues à certaines maladies.

Résultats : Le RRAA lié à la mortalité à Eskasoni était de 1,0 pour trois des quatre années étudiées, quoique les données aient pu sous-estimer la mortalité à Eskasoni. Les RRAA liés aux hospitalisations à Eskasoni étaient sensiblement plus élevés que dans les populations de référence. Les taux d'hospitalisation pour néoplasme étaient généralement inférieurs, tandis que les RRAA d'hospitalisation pour maladies circulatoires étaient sensiblement plus élevés. Une augmentation des taux d'hospitalisation pour diabète a été observée, et le RRAA associé à cette maladie est devenu significatif pendant les dernières années de l'étude. Les maladies respiratoires étaient la principale cause d'hospitalisation, avec des taux sensiblement supérieurs. La pneumonie et la grippe ont représenté plus de la moitié des hospitalisations dues aux maladies respiratoires. Les hospitalisations dues à des maladies infectieuses étaient plus communes dans Eskasoni, tandis que les taux d'infection hépatique étaient généralement bas.

Conclusions : Les résultats donnent à penser que les membres de la plus grande bande de Mi'kmaq sont plus vulnérables à certaines catégories de maladies, et que la promotion de la santé devrait être axée sur les maladies respiratoires, les troubles de la circulation et la gestion du diabète. Il serait cependant important de procéder à des analyses plus poussées.

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