Who Uses Hospitals in Alberta?

Two Years of Population-based Evidence for Health Services Planning and Policy

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Primary Author:
Donna M. Wilson, RN, PhD
Professor - Faculty of Nursing
Third Floor Clinical Sciences Building
University of Alberta
Edmonton, AB T6G 2G3
Tele (780) 492-5574, Fax (780) 492-2551
donna.wilson@ualberta.ca

Who Uses Hospitals in Alberta? Executive Summary

An analysis of complete individual-anonymous in-patient and ambulatory care data collected on every person admitted to hospitals across Alberta in the two most recent years of available data (April 1, 2006-March 31, 2007 and April 1, 2007-March 31, 2008) was completed to compare the use of hospitals by older and younger persons; and clarify their use of in-patient hospital, emergency department, outpatient clinic, and daysurgery services.

In-patient Hospital Beds and Services Use

- In the first year, 275,738 individuals were admitted for in-patient care (8.4% of 3,290,350 Albertans), with 281,320 people admitted the second year (8.2% of 3,421,300 Albertans).

- 76.4% of these people were under 65 years of age. Their average age was 39.5, with ½ under the age of 36. Children under the age of one year were most often hospitalized; this age group was responsible for 17.4% of all hospital admissions.

- In-patients under the age of 65 had 1.1 procedures on average performed each hospital stay as compared to 0.9 procedures on average for older persons, and 67.5% of all persons admitted to critical care units were younger people. Younger people also had longer critical care unit stays than older people (6.5 days versus 4.7 days on average).

- 57.6% of all 731,110 admissions to hospitals in Alberta were to Edmonton and Calgary city hospitals. Edmonton and Calgary city hospitals admitted as many as 107 patients on average every day of the year, while 16 hospitals elsewhere in the province admitting fewer than 365 persons each year.

Hospital Ambulatory Care Services Use

- In the first year, 1,436,399 individuals (43.7% of 3,290,350 Albertans) were admitted to a hospital emergency department, daysurgery clinic, or outpatient clinic; with 1,480,693 people admitted for ambulatory care the second year (43.3% of 3,421,300 Albertans).

- 84.3% of these people were under 65 years of age; the average age was 38.8 and ½ were under the age of 38. Children aged 1 year were the most common ambulatory patients.

- Older patients had 1.19 procedures on average performed each ambulatory care visit, while younger persons had 0.95 procedures performed; yet 34.6% of younger people and 23.2% of older people had no procedures performed when admitted for ambulatory care.

- In the first year, a total of 6,926,535 ambulatory care visits in the province were recorded, with 7,091,396 recorded in the second year; 47.9% of all 14,018,131 ambulatory care admissions in these two years were to the 10 Edmonton and Calgary city hospitals.

Summary: Younger people are the most common hospital in-patient and ambulatory care patient. For every 1 hospital in-patient admitted, 20 more are admitted to hospitals for ambulatory care.

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Older people are often thought of as high users of hospitals, as it is common to believe that people become ill with aging. Past research has emphasized that older people have higher rates of illness and are more often hospitalized. It is not surprising then that there is considerable concern over the sustainability of Canada's universal publicly-funded health care system with population aging. While health system sustainability is highly debatable, as health care changes and population health improvements have reduced hospitalization rates to where only 8.4% of Canadians are hospitalized for one or more days of in-patient care each year now (Canadian Institute for Health Information [CIHI], 2007, 2008), population aging is definitely occurring. The 2006 census found 13.7% of Canadian citizens were 65 years of age or older (Statistics Canada, 2009), with this proportion projected to increase to 23-25% by 2031 (Statistics Canada, 2005). Alberta was identified once again as the youngest province, with only 10.7% of all 3,290,350 Albertans or 353,410 persons 65 years of age or older (Statistics Canada, 2009). Similar age-based proportions were projected for 2007 when the Alberta population was estimated at 3,421,300 (Statistics Canada, 2009). The substantial population growth that occurred from 2006 to 2007 was the result of an economic boom, with (younger) people attracted to Alberta for employment and career purposes, and with over 50,000 births in the year. In 2008, despite the global economic downturn, the Alberta population continued to grow, to an estimated 3,497,881persons (Statistics Canada, 2009).

Census information is carefully collected and analyzed, with reliable population-based evidence gained for use by governments and other groups or individuals. Hospital utilization information is also carefully collected by provincial and territorial health departments across Canada, with researchers having access to these data for the purpose of furthering evidence-based health services planning and policy. The data provided to researchers does not include patient names, addresses, or any other information that could identify individuals. An analysis of complete individual-anonymous in-patient and ambulatory data collected on every person admitted to hospitals across Alberta in the two most recent years of available data (April 1, 2006-March 31, 2007 and April 1, 2007-March 31, 2008) was recently completed. The primary purpose of this analysis was to compare the current use of hospitals by older and younger persons so as to clarify their use of in-patient hospital, emergency department, outpatient clinic, and daysurgery services.

Literature Review

Most past health service utilization studies have focused on hospital beds or emergency departments, with a few focused on outpatient department use or daysurgery clinic use. Although important information has been gained through these past single-focus studies, the determination of total hospital services utilization by individuals is not only possible now with health information advances but extremely important. It is becoming evident that only a small proportion of people are high users of many different health services and that many more are minimal or non-users of most health services. Research is needed to differentiate these people, so their diverse needs for health care and health promotion can be better understood and addressed.

Health services utilization research is also needed to ensure that current population-based

health services utilization information is available for health services planning and policy. Most published health services utilization research reports have been based on 1960-1999 hospital utilization data. Although the information from these studies is important for historic purposes, health care clients and utilization patterns are likely to be different now. Hospital downsizing and health care advances are thought to have shifted most diagnostic tests and also surgical and non-surgical treatments into ambulatory care settings. Another major issue is that many past health service utilization studies have only reported on older people. Although this reporting was helpful for identifying seniors' care needs, this research has helped to perpetuate the belief that older people are high users of hospitals and perhaps also the only ones admitted to hospital.

Research Methods

In late 2009, two large datasets comprised of all data routinely collected in the two most recent years on every in-patient and ambulatory patient admitted to acute care hospitals across Alberta were provided upon request to the principal researcher for analysis. Additional socio-demographic data were also provided on every person in Alberta who was a resident of the province and eligible for publicly-funded health care through the Alberta health care insurance program from April 1, 2005 through March 31, 2007. All data provided were individual-anonymous, with a consistent personal identification number to enable a compilation and analysis of data for each individual within and across these databases. Two years of data were requested as a quality measure, so findings from the first year (2005-06) year could be compared to the findings from the second year (2006-07) year. Although some differences are expected from year to year, the findings from one year should not be entirely dissimilar to the other. Through analyzing and comparing two years of data, data issues or analysis errors can be detected and addressed. The two years of data could also be merged, with summary data thus available for a clear understanding of findings.

The data received included all data routinely collected on every person admitted to an in-patient bed in Alberta for one or more days of care. These data variables were in keeping with the Discharge Abstracts Data (DAD) routinely collected in all acute care, cancer, rehabilitation, and psychiatric hospitals across the province (approximately 125 facilities). These data variables are similar to all other DAD data variables and therefore in-patient hospital data collected across Canada (Canadian Institute for Health Information, 2009). In addition, data were received on all persons admitted to hospital emergency departments, daysurgery clinics, and outpatient clinics in Alberta over the same time period, with all such data collectively gathered by the province into one Ambulatory Care Classification System (ACCS) database. The additional registry data provided consistent socio-demographic information on every in-patient and ambulatory care patient. Although no information that could result in any patient being identified was provided to the researcher, research ethics approval was applied for and received. A Canadian Institute for Health Research (CIHR) grant permitted both the purchase of the data ($5,400 plus GST), and the cost of data cleaning and data preparation by a research assistant. Following this, the SPSS computer program was used to explore and describe patients, and compare the utilization of younger and older patients. The following findings are divided into two main sections: (a) in-patient hospital utilization, and (b) ambulatory services utilization.

In-patient Hospital Utilization

In the first year, 275,738 Albertans were admitted one or more times to hospitals across Alberta for in-patient care lasting one or more days (8.4% of 3,290,350 Albertans), with 281,320 individuals admitted the second year (8.2% of 3,421,300 Albertans). This hospital admission rate is similar to the Canadian Institute for Health Information's (2008) cross-Canada rate of 8.4%. As illustrated in Table 1, over the two years combined, hospitalized individuals were more often female (59.8%) and resided in urban areas (82.0%). In addition, 76.4% were under 65 years of age. Children who were not yet one year old comprised the most common age group (17.4%) hospitalized. The average age of all hospitalized in-patients was 39.5, with ½ under the age of 36. These findings show a surprisingly heavy share of hospital use by people who are younger than older people and also younger than the baby-boomers - the extremely large population cohort born in 1946-1966, who currently range in age from 43 to 63. As also illustrated in Table 1, similar findings were noted when one year was compared to the other.

Some additional age-based findings were that younger in-patients had more done to them in hospital than older hospitalized in-patients. Over the two years combined, younger persons had 1.1 procedures on average performed on them during each hospitalization, as compared to 0.9 procedures on average for older persons. As Table 1 also outlines, similar age-based procedure differences were found in the first and the second year. In addition, two thirds (67.5%) of all patients admitted to intensive care units or other critical care units were younger persons. Younger people also had significantly longer intensive care unit stays on average (143.7 hours or 6.5 days) as compared to older people (101.3 hours or 4.7 days). These findings show younger patients use more of the most expensive hospital services.

The hospitals that Albertans were admitted to varied in services and service capacity. Most hospitals were classified as general or acute care hospitals. A small number were specialized into psychiatric hospitals, children's hospitals, auxiliary hospitals, rehabilitation hospitals, and cancer hospitals. Of all persons admitted to all such facilities over the two study years, 19.3% were rural citizens and 80.7% urban citizens. The 2006 Canadian census revealed similar proportions of Albertans live in urban (80%) or rural (20%) areas (Statistics Canada, 2009). In total, 57.6% of all 731,110 admissions in these two years were to the 10 hospitals in Edmonton and Calgary. These 10 hospitals in Edmonton and Calgary had a total of 401,859 admissions over the two years, with rural people accounting for 10.4% of these admissions. All remaining health care facilities in the province had a total of 296,020 admissions over the two years, with rural people accounting for 31.5% of these admissions. Hospitals in Edmonton and Calgary admitted as many as 107 patients on average every day of the year, while 16 acute care hospitals elsewhere in the province admitting fewer than 365 persons each year.

The reasons why Albertans were admitted to hospital for one or more days of in-patient care varied greatly. The most common diagnosis among all hospital admissions each year and over the two years combined was pregnancy/childbirth (14.7% of all hospital admissions). The next most common reason was for a digestive problem (8.9%), followed by a heart/blood vessel or circulatory problem (8.2%), an injury, poisoning or certain other consequences of external causes (8.2%), a respiratory or lung problem (6.7%), a mental or behavioural disorder (5.4%), cancer (5.2%), a genito-urinary system problem (5.1%), and then other less common problems.

A small number of Albertans were admitted to hospital more than once each year; only 1.0% of Albertans (2,854 people) who were hospitalized the first year and 1.4% of Albertans (3,992 people) who were hospitalized the second year were admitted 2 or more times that year to

hospital. The average number of admissions was 1.31 per person because admissions ranged from 1 to 303 in number per person. People who were admitted 2 or more times each year were more typically rural; 25.1% of all 6,846 readmitted in-patients lived in rural areas of Alberta. Mental illness was the most common diagnosis among all readmitted in-patients. Albertans who were admitted 2+ times to hospital each year were 57 years of age on average. Just over half (52%) were under the age of 65. Children under the age of one year were the most common age group to be admitted 2 or more times each year. These findings show people of all ages can have serious health problems that lead to repeat hospitalizations.

The average length of hospital stay was 7.0 days for people under the age of 65 and 15.1 days for older people. Despite the much longer average hospital stay by older people, younger people used 52.8% of all hospital bed days (e.g. the total number of in-patient days of care provided in all hospitals to all patients over these two years). The majority of hospital stays were short, ½ of all patients stayed less than 4 days in hospital. The most common stay was 2 days in length. The people with the longest stays were most often admitted because of a mental illness.

Albertans with long stays were at times those who waited in hospital for a nursing home or rehabilitation bed, with alternative care days recorded to show how many days they waited. In the first year, 2.2% of all individuals admitted to hospital (6,103 people) had alternative level of care days recorded. In the second year, 2.1% had alternative level of care days recorded (6,014 people). The stay in hospital while waiting placement was shorter than expected, as the average number of alternative care days was 29.5 the first year (median=13, mode=7) and 36.9 the second year (median=19, mode=7). Of all persons waiting placement, 80% waited less than 37 days the first year and 80% waited less than 45 days the second year. The hospital in-patients who waited placement averaged 78.1 years of age (median=82, mode=85 or 87). Although most people who waited placement were older, 14.0% were under the age of 65. These younger people had a longer wait in hospital (43.7 days) on average than older people (27.5 days).

Half of all patients who waited in hospital for placement in a rehabilitation or nursing home bed had no surgery and no major diagnostic tests or procedures performed in hospital. These people only received nursing care, care they could have received in nursing homes, where nursing care is provided around the clock, if these beds were available. Some could possibly have been discharged home, although Albertans who are assessed and approved for continuing home care normally only receive 2 hours of home care assistance on average each week. As the people who wait for placement in hospital typically receive 2-4 hours of nursing care in total over each 24 hour period, they are not good candidates for home care as currently provided. Similarly, these people are not good candidates for care in lodges or assisted-living facilities, as these facilities do not provide or provide for 2-4 hours of nursing care each day.

Finally, 16.4% of the patients who waited for placement in hospital died in hospital. Of all persons admitted to hospital, 3.3% died in hospital. Although compassionate end-of-life care is no doubt provided in hospitals across Alberta, this type of care can also be provided in homes, nursing homes, and hospices. However, there are less than 10 hospices in Alberta that provide in-patient care and nursing home beds have stayed around the same number (approximately 13,500 beds) since 1995, with nearly 100% occupancy in nursing homes at all times of the year.

Table 1. Hospital In-patients and Hospital Ambulatory Care Patients – Utilization Summaries

	First Year (2005-06)	Second Year (2006-07)	Two Years Combined
Hospital In-Patients			
Age – each individual person (%)			
- Younger (<65)	76.0	76.7	76.4
- Older (65+)	24.0	23.3	23.6

Age – each individual admitted			
- Mean years	39.75	39.2	39.47
- Median years	37	36	36
- Mode years	0	0	0
- Range in ages	0-108	0-108	0-108
Gender – each individual (%)			
- Female	59.8	60.0	59.8
- Male	40.4	40.0	40.2
Residence – each individual (%)			
- Urban	81.9	82.1	82.0
- Rural	18.1	17.9	18.0
Length of stay (each admission)			
- Mean	8.89	9.04	8.97
- Median	4	4	4
- Mode	2	2	2
- Range	1-12,092	1-9,251	1-12,092
Admissions per Person (total N/year)			
- Mean	1.32	1.31	1.31
- Median	1	1	1
- Mode	1	1	1
- Range	1-303	1-22	1-303
Procedures Per Person (total N/year)			
- Mean	1.39	1.39	1.39
- Median	1	1	1
- Mode	1	0	0
- Range	1-46	0-43	0-46
Ambulatory Patients			
Age – each individual (%)			
- Younger	84.3	84.3	84.3
- Older	15.7	15.7	15.7
Age – each individual (years)			
- Mean years	38.7	38.8	38.8
- Median years	38	38	38
- Mode years	1	1	1
- Range in ages	0-110	0-111	0-111
Gender – each individual (%)			
- Female	52.6	52.7	52.7
- Male	47.4	47.3	47.3
Residence – each individual (%)			
- Urban	81.0	81.1	81.1
- Rural	19.0	18.9	18.9
Total Procedures - per person (total number in year)			
- Mean	4.66	4.59	4.62
- Median	2	2	2
- Mode	1	1	1
- Range	1-1,628	1-1,377	0-1,628
Total Ambulatory Visits - per person (total number in year)			
- Mean	4.62	4.59	4.61
- Median	2	2	2
- Mode	1	1	1
- Range	1-1,313	1-1,591	1-1,591
ER Visits – per person			
- Mean	2.1	2.11	2.1
- Median	1	1	1
- Mode	1	1	1
- Range	1-1,258	1-1,582	1-1,582
Daysurgery Visits – per person			
- Mean	4.33	4.31	4.32
- Median	1	1	1
- Mode	1	1	1
- Range	1-996	1-1,051	1-1,051
OPD Clinic Visits – per person			
- Mean	4.34	4.3	4.32
- Median	2	2	2
- Mode	1	1	1
- Range	1-1,301	1-766	1-1,301

Ambulatory Care Services Utilization

In the first year, 1,436,399 Albertans (43.7% of all 3,290,350 Albertans) were admitted to a hospital ER, daysurgery clinic, or outpatient clinic for ambulatory care, with 1,480,693 (43.3% of all 3,421,300 Albertans) admitted the second year. As illustrated in Table 1, of all people admitted for ambulatory care these two years, 52.7% were female and 47.3% male. In addition, 81.1% were urban and 18.9% rural residents of the province, and 84.3% were under 65 years of age as compared to 15.7% aged 65 or older. Children who were 1 year old were the most common (1.8%) ambulatory patients, followed by children 2 years of age (1.6%). The average age of all ambulatory patients over these two years was 38.8, with ½ under the age of 38. As also illustrated in Table 1, similar findings were noted when one year was compared to the other.

Some additional age-based findings show older ambulatory care patients had slightly more procedures performed on them on average as compared to younger ambulatory care patients. Over both years combined, older patients had 1.19 procedures on average performed at each ambulatory care visit, as compared to 0.95 procedures on average for younger persons. This age-based procedure difference was also found when each of the three ambulatory care services was assessed separately: (a) older people had 1.40 procedures performed per visit on average when admitted to a daysurgery unit as compared to 1.17 for younger people, (b) older people had 0.92 procedures performed per visit on average when admitted to an ER as compared to 0.56 for younger people, and (c) older people had 1.24 procedures performed per visit on average when admitted to an outpatient clinic as compared to 1.11 for younger people. These age-based differences in utilization are largely explained by the finding that 34.6% of younger people and 23.2% of older people had no procedures performed when admitted to an ambulatory care setting. The range of procedures provided per visit was the same regardless of age; both older and younger patients had 0 to 10 procedures performed per ambulatory care visit.

Only slight differences in diagnoses for younger and older ambulatory patients were noted. The most common diagnosis among all ambulatory patients was the vague "factors influencing health status and contact with health services," with 48.9% of younger patients having this diagnosis and 57.4% of older patients. The second most common diagnosis for younger persons was mental illness (8.9%), followed by "injury, poisoning and certain other consequences of external causes" (7.9%), another vague diagnosis "symptoms, signs and abnormal clinical or laboratory findings" (6.2%) and many other less common diagnoses. For older persons, the second most common diagnosis was circulatory disease (7.7%), followed by "symptoms, signs and abnormal clinical or laboratory findings" (5.9%), nervous system and sense organ conditions (5.2%), and many other less common diagnoses. Some differences in diagnoses were found from year to year, and across the three ambulatory care areas, although this summary of diagnoses in all ambulatory care areas combined and by age provided above is relatively similar to these additional findings.

Many of the Albertans who were admitted once to an ambulatory care setting were admitted again. As shown in Table 1, ER visits averaged 2.1 per person, daysurgery clinic visits averaged 4.32 per person, and outpatient clinic visits averaged 4.32 per person. In the first year, a total of 6,926,535 ambulatory care visits in the province were recorded, while 7,091,396 were recorded in the second year. Of these 14,017,931 admissions, 10,530,877 (75.1%) were by persons under the age of 65 and 2,862,356 (20.4%) were by persons aged 65 and older (4.5% were by persons who did not have their age recorded). In addition, 47.9% of all 14,018,131 ambulatory care admissions in the two years were at 10 Edmonton and Calgary city hospitals.

Discussion

This analysis of hospital utilization data revealed younger persons are the most common patient admitted to hospitals in Alberta for one or more days of in-patient care, as well as the most typical patient admitted to Alberta hospital ERs, daysurgery clinics, and outpatient clinics. For every 1 older person admitted to a hospital bed for in-patient care, 3.25 younger persons were admitted. For every 1 older person admitted to a hospital for ambulatory care, 5.4 younger persons were admitted. Although it could be said that older people are more at risk of being admitted to hospital as compared to younger people and that older people are more at risk of admitted for ambulatory care than younger people, as reported by other researchers (Blackwell et al., 2009), the fact remains that hospital patients of all kinds basically reflect the population distribution of Alberta - a province that is comprised of 89.3% younger people. This study clearly shows that older people are not the only Albertans who have health problems, and who seek to have these health problems diagnosed and treated. Instead, this study shows that younger people are the primary users of hospitals in Alberta. This use of both in-patient beds and ambulatory care services in hospitals by younger people is surprising and concerning. These finding indicate attention to the health and health care needs of younger persons is warranted.

Some past research has suggested that with the hospital downsizing that occurred across Canada in the 1990s, including the 50% hospital bed reduction in Alberta (from 13,000 to 6,500 hospital beds in 1993-95), only old people are admitted to hospital beds now, as younger people have been shifted to ambulatory care for outpatient tests and treatments (Sheps et al., 2000). This Alberta study shows instead that younger people are the most common in-patient as measured by admissions and also by their share of total bed days. This study also found both older people and younger people receive ambulatory care. For every 1 person of all ages who is admitted to a hospital bed for in-patient care, 20 more are admitted to hospital for ambulatory care.

It is also important to emphasize that only slightly more than 8% of Albertans are admitted to an in-patient hospital bed each year now, while over 40% of all Albertans are admitted each year to an ambulatory care area in these same hospitals. Although much concern about health care technology advances leading to additional expensive and perhaps futile treatment in hospital beds has been raised in the past, health care technological and knowledge advances have clearly made it possible for the vast majority of health care to be delivered on an ambulatory or outpatient basis. Ambulatory care is much less expensive to provide than in-patient hospital care. Ambulatory care is also easier to plan and deliver as compared to in-patient hospital care that is provided 24 hours a day and 7 days a week, and to people who have much more serious health issues than those who can receive ambulatory care.

The concern, however, with this well established and ongoing shift to ambulatory care is that the burden of pre and post ambulatory care is shifted to the patient and also often their family or friends. Although some tax credits exist for working people who claim medical expenses; there are few other ways that the time, effort, and expense of this ambulatory shift are addressed now. Older people and rural people are the most at risk of being burdened with this shift to ambulatory care. Older people and rural people are also more affected by another shift, this being the consolidation of major tests and treatments at a few large urban hospitals. The accumulative effect of travel can be extremely burdensome; as it is now possible for a person to become ill, have many different diagnostic tests and many procedures performed, and pass away – without ever having spent a single night as a hospital in-patient.

Conclusion

Research is important for correcting myths about aging and for preventing ageism. Ageism is intended or unintended prejudice against older people. This study of recent, complete, and population-level hospital data, which sought to clarify the use of hospitals by older and younger persons, clearly demonstrates that people of all ages can have health problems and a need for health care. Many more points could be made and concerns raised over the findings of this study, but the most important concern is that younger people are responsible for a large share of hospital in-patient and ambulatory care services provided across the province. In short, the people who currently use hospitals across the province basically reflect the population of Alberta - a province that is 89.3% comprised of younger people.

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Disclaimers

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Donna M. Wilson, RN, PhD
Nursing Professor - University of Alberta
donna.wilson@ualberta.ca