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**A Case Study of High Users of Hospitals for
Evidence-based Health Policy and Health Services Planning:
A Report for Public Dissemination and Discussion Purposes**

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Executive Summary

Four data collection activities were undertaken to focus attention on high users of hospitals.

Systematic Research Literature Review

- High users were repeatedly identified as a very small proportion of patients who were responsible for a disproportionately large share (20-80%) of total utilization however measured. Many different types of patients were found to be high users, although mainly female and in poor health. Many factors contributing to high use were identified, with further study needed to identify and validate current Canadian factors.

Two-hospital Acute Care Utilization Study

- High users of hospital beds, ERs, outpatient clinics, and daysurgery units were most often younger persons with mental illnesses admitted 2 or more times in one year to hospital. One quarter of high users were older persons (age 65+) whose pattern of utilization was primarily through one long stay (30+ days). Depending on the area, 0.4% to 9.2% of admitted patients were responsible for 6.6% to 35% of utilization.

Qualitative Study of High Users

- Similar findings for why some people are high users of hospitals were identified across the two high user groups - readmitted younger patients suffering from mental illnesses and older long-stay (30+ days) patients. These findings could be grouped into three themes: (a) serious illnesses and high care needs, (b) hospitals are an accessible and often sole place to get needed care, and (c) hospital and post-hospital factors external to these people engender long hospital stays or hospital readmissions.

Psychiatric Hospital Utilization Study

- The majority of patients admitted to one 410-bed hospital were male and younger, with younger people more often high users both through long stays and more frequent readmissions to this hospital for acute psychiatric care. Stays were often long; 153.9 days on average, 52 day median, and 15 day mode. Patients were received by transfer from acute care hospitals (82.6%) and nursing homes (16.0%) across the province. Most discharges from this psychiatric hospital were to the patient's home (91.1%) or to nursing homes and other LTC facilities (6.9%) across the province.

Summary: Younger mentally-ill (male) persons were the most common high users of hospitals, with older (female) persons another group at risk of being high users of hospitals through long stays. The use of hospitals by high users is concerning for many reasons, and it could be addressed by creative approaches and health service expansions.

Recommendations: Routine flagging of high users of hospitals - patients with 30+ day stays and patients readmitted within 12 months of discharge - is recommended. Each person could then be assessed on a case-by-case basis to determine what could be done differently to better meet their health care, health promotion, and/or nursing care and support needs.

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Although hospital utilization has been the subject of much administrative and research scrutiny, with many past and current reports indicating older persons are high users or the highest users of hospitals (Blackwell et al., 2009; Canadian Institute for Health Information [CIHI], 2008a), few studies have actually focused on the identification and description of high users. This knowledge gap is unfortunate as it is becoming evident that only a small proportion of citizens are high users of hospitals and they should be of considerable interest as their use collectively of hospitals is substantial, with hospital care the most expensive healthcare service (CIHI, 2007). The first published study on high users in 1980, for instance, reported that 13% of hospital patients had billings equal to the combined charges of all other patients (Zook & Moore, 1980). That study also found high-cost patients had more unexpected complications in hospital than other patients. Given the need to ever more carefully use expensive and increasingly scarce inpatient hospital beds, current and comprehensive studies on high users are warranted.

The following report details four sequential data gathering activities which together provide a case study of high users of hospitals. The first was a systematic review of research literature that identified high users and listed factors or variables associated with high use. This review informed a study designed in part to identify and describe high users at two full-service hospitals in Alberta. The findings from this analysis of hospital data were in turn used to plan a follow-up qualitative study. This qualitative study sought an in-depth understanding from high users and persons familiar with them what had led to their considerable need for and use of inpatient hospital services. Finally, a quantitative analysis of provincial hospital data was undertaken to further describe a common high user group. The methods and findings from all four activities are outlined in this case study report, with the findings then discussed in relation to recent health care, health system, and policy developments.

Case Study Methodology

Case studies are undertaken whenever holistic information about a program or system is needed for examination and perhaps comparison purposes (Yin, 1999). Although generalization is not a normal expectation, case studies provide information that is useful in other applications (Flyvbjerg, 2006). Case studies typically are thick descriptions of complex events, situations, or processes; involving the triangulation of information gained from multiple sources (Yin, 2009). All data sources and data should be credible, with careful decisions needed for selecting data sources and for analyzing and synthesizing data.

The following report is divided into five sections. The first section is an outline of the systematic literature review method and findings. The second section is an outline of the quantitative data analysis method and findings associated with high users. The third section is an outline of the qualitative study method and findings on high use. The fourth section is an outline of a (second) quantitative study method and findings associated with the use of one psychiatric hospital by mentally-ill persons, as these persons were identified as at greatest risk of high use of hospitals. The fifth and final section is a discussion of all findings.

1. Systematic Review of Published Research Literature

The systematic literature review was undertaken to examine published high-user research reports to assess operational definitions for identifying high users and list factors or variables tested and found significant for their association with high use. Systematic reviews are one of the most important methods for establishing evidence (Russell, 2005). Systematic reviews are typically undertaken by gathering all relevant peer-reviewed published research reports on a particular topic, and then critically reviewing each report for findings relevant to the review purpose. Some research articles may be rejected from review as a result of research quality or reporting issues, with the entire state of evidence within this body of literature then critiqued (Russell). There are two main outcomes from exacting reviews: (a) valid and reliable information is made evident, such as when multiple high-quality research studies have the same findings and/or reach the same conclusions, and (b) gaps in evidence are identified, such as when there is little research or only low-quality research exists.

Systematic Literature Review Method

The literature search was conducted in 2005 in eight library databases that contain most if not all peer-reviewed published healthcare literature (Medline, CINAHL, PsychInfo, HealthSTAR, Ageline, Global Health, AMED, and EMBASE). The search terms used to gain literature for review were “hospital,” “acute health care,” “tertiary health care,” “high user,” “high use,” “high utilization,” and “research.” “High cost” was added as a search term when a preliminary review revealed this term identified potentially-relevant literature. A total of 1,667 articles were identified, although few focused solely on high users of hospital beds. The criteria used to select potentially-relevant research articles for systematically review were thus refined to: (a) a quantitative research study had been conducted, with information provided on these data and data analysis methods, (b) a proportion of inpatients were identified as high users, with or without factors/variables associated with their high use, (c) English language, and (d) individual hospital utilization data was studied, with data not aggregated by age group or gender (as was found in all pre-1980 articles).

These criteria narrowed the search to 194 abstracts. The selection process was undertaken by two researchers working separately to ensure potentially relevant articles were not rejected. All 194 publications were obtained and read, with the researchers identifying the same 14 as meeting all criteria. The references cited in these 14 articles were scanned and another 7 articles identified for review. Of these 21, 11 were published in the 1980s, 5 in the 1990s, and 5 in the 2000s. Their research methods varied considerably, as did the quality of reporting. As the primary purpose of this review was to inform a quantitative high use study, all 21 were retained and systematically reviewed (see article summaries in Table 1).

Information was sought from each report to identify the: (a) research methods used to gather and analyze the data, noting specifically how high use had been operationally defined, and (b) findings, including the incidence of high users and factors/variables associated with high use. When each report had been systematically reviewed, by two researchers working separately, a collective critical assessment process was undertaken. The research methods were compared and contrasted to identify methodological strengths and issues. All high use definitions, then factors/variables associated with high use, were subjected to content analysis and categorization into themes. This grouping of findings is a common practice in

systematic literature reviews (Russell, 2005). At a larger team meeting in early 2006, a draft report of these themes and related findings was discussed and approved.

Systematic Literature Review Findings

Previous Research Methods

All reviewed reports described statistical analyses of inpatient hospital utilization data and often additional health services data. Data were collected by the researchers or more often provided to the researchers by an agency responsible for the data. Eleven studies involved American data and 10 involved Canadian data. Two reports were of high users at one hospital, the remaining involved multiple hospitals or in a few instances, multiple subjects reporting on their hospital utilization. Subjects per study ranged from 1,122 to 2.4 million persons. Random sampling techniques were occasionally used, but more often subjects were all those in a provincial or state-wide hospital database, with data reflecting a timeframe that was usually one year in length. Considerable variation in data analysis methods was noted, although simple descriptive-comparative statistics were common.

All investigations were retrospective, often involving analyses of 1960s, 1970s, and/or 1980s utilization data. Seven analyzed 1990-2005 data; with these of particular note as advances in ambulatory diagnostic tests and treatments, and other factors such as hospital downsizing in the 1990s would have shifted care out of hospital beds (CIHI, 2001; Saunders, Bay & Alibhai, 1997; Sheps et al., 2000). Another issue is that the data analyzed were often routinely collected, a circumstance limiting explanatory variables or predictive factors for study. No studies employed mixed qualitative/quantitative research methods.

Operationally Defining High Use

With one exception, operational definitions of high use varied considerably. Two Canadian publications reported on roughly the same data and data years, and both used a common definition - high users had been hospitalized in various types of hospitals in the same province for 61 days or more over one year (Evans et al., 1989; Hertzman et al., 1990).

Given this considerable variance, a decision was made to group high-use definitions using manual qualitative-style coding and categorization methods (Bisit, 2003; Carney, Joiner & Tragou, 1997). All definitions were identified, key components in these definitions noted, and components categorized into groups and then grouped into two themes: (a) definitions focused on high use measures; hospital days, hospital costs, and hospital admissions, and (b) numbers-based versus proportion-based definitions.

Definitions Focused on Measures of High Use; Hospital Days, Hospital Costs, and Hospital Admissions.

Fourteen of the 21 studies defined high users using one measure, while the remaining 7 used two or three. The most common measure was hospital days, where a select number of bed days was used to distinguish high users from other users (13/21 studies), followed by a select cost (9/21 studies), and then a distinct number of hospital admissions (6/21 studies).

Hospital bed days. Although 13 studies reported on hospital bed days, their operational definitions of high use varied considerably. Some definitions were of the type where a small proportion of subjects were selected and their share of total hospital days in one year calculated. The findings from these studies varied considerably; 1% of patients in two Canadian provinces accounted for 14% of all hospital days of care (Johansen, Nair & Bond, 1994), while another Canadian study in a different province found 2% of patients accounted for ½ of all hospital bed days (Evans et al., 1989). Other studies showed 3% of patients accounted for 47% of hospital bed days (Roos & Shapiro, 1981), 5% of patients accounted for 20% of hospital bed days (Shapiro, 1983), and 10% of patients accounted for ½ of all hospital bed days (Johansen, Nair & Bond, 1994). Another definitional variance was illustrated by the two studies that used 61 or more days to distinguish high users as these were accumulated in acute care and extended care hospitals (Evans et al., 1989; Hertzman et al., 1990).

Another type of definition was provided in the most current study. Dendukuri et al. (2004) used the 90th percentile to distinguish high hospital bed day users. This study reported on hospital days accumulated over the first six months after a visit to an emergency department. This was the only study with a timeframe shorter than one year. One study involved a 5-year timeframe where 291 or more days in hospital distinguished high users of hospitals (Wilson & Truman, 2002). The 291 count was two standard deviations above the mean for all subjects. In contrast, Reuben et al.'s (2002) study reported 11 days over three years marked high bed day users.

High bed days could also be accumulated in one hospitalization. Two Canadian studies used the criteria that any patient exceeding 27 or 30 day hospital stays was a high user, as hospitals exist to provide acute care and stays lasting 30 days or less are therefore expected (Shapiro, Tate & Roos, 1987) and stays over 27 days would have included subacute or rehabilitative days (DeCoster et al., 1997). Shorter counts, such as 18 (Shapiro, 1983) and 19 (Belcher & Alexy, 1999) were also used to distinguish high users by hospital episode.

Hospital costs. The nine studies that used hospital costs as an indicator of high use were all undertaken in the United States. A wide variety of operational definitions were evident. Four studies had an exact dollar figure distinguish high users from other users. This cost varied from a low of \$10,000 in McCall's (1984) study and Anderson and Knickman's (1984) study, to a high of \$19,756 in Meenan et al.'s (2003) study and \$20,000 in Drucker et al.'s (1983) study. These costs for the highest users were tabulated over multiple hospitalizations and also through the use of other health services, and over various time periods. For instance, McCall (1984) calculated total health care charges in the last year of life, while Anderson and Knickman (1984) calculated total Medicare expenditures in a recent calendar year. These studies could have been removed from this systematic review, although all showed inpatient hospital utilization was a major contributing cost factor.

High users were more often defined by focusing on a percentage of patients with the highest costs. The first published study by Zook and Moore (1980) found 13% of hospital patients having bills that were equal to those for all remaining patients. Another costing method was apparent in McCall and Wai's (1983) study where 18% of subjects were found responsible for 88% of total costs, with high users having costs above the 75th percentile that year. Another costing method was evident in Meenan et al.'s (2003) study where a small predetermined proportion was studied; 0.5% and 0.1% of patients were found responsible for

20% and 29% respectively of all expenditures.

The populations studied also varied. For instance, both McCall's (1984) and Anderson and Knickman's (1984) studies involved Medicare data, with their populations confined to older Americans who qualified for Medicare. Meenan et al.'s (2003) subjects were enrolled in five different Health Maintenance Organizations (HMOs). Drucker et al.'s (1983) subjects were admitted to one hospital, the only costing study of people at all ages.

Hospital admissions. Six studies used the number of admissions to hospital to indicate high use, with 3 undertaken in the United States and 3 in Canada. Definitional approaches and research methods varied considerably. One definition was proportional, as illustrated by the finding that 3% of patients, all admitted 2 or more times in 2 years, accounted for 31% of all hospital admissions over the 2 years (Roos & Shapiro, 1981). Another proportional definition is illustrated in McFarland et al.'s (1985) study where 13% of patients were flagged as high users, as they were in the top quartile of use over a 7-year period, accounting for 35% of admissions. Sutton and Aliberti's (1994) study also used a proportional approach; patients with multiple chronic illnesses had three times the number of hospital admissions as compared to patients with one acute or chronic illness.

The three remaining studies employed the concept of outliers in a utilization distribution. One such study reported that patients with 4 or more admissions to hospital in a year were high users (Johansen et al., 1994), while another found patients with 6 or more admissions to hospital in a year were high users (Belcher & Alexy, 1999). The third study identified high users (2.1% of subjects) over a 5-year period, with 17 or more admissions distinguishing high use (Wilson & Truman, 2002). This count was identified as 2 standard deviations above the mean.

Numbers-based Versus Proportion-based Definitions

The information above focused on three measures of high use. That discussion illustrated the second theme among high-use definitions; some were numbers-based while others proportion-based.

Numbers-based definitions. High use was most often defined on the basis of an individual exceeding a certain number of hospital days either in one hospitalization or over multiple hospitalizations. Additional numbers-based definitions focused on hospital costs or admissions. Counts were typically tabulated over the course of one fiscal or calendar year, although single hospital episodes and counts over 5 year (Wilson & Truman, 2002) or 7 year (McFarland et al., 1985) timeframes were also employed. Few rationales for any definitions were provided but most were based on utilization distributions. Each individual patient's days of care, costs, or admissions were compared against those of all other individuals in that distribution. Following this, a decision was made to distinguish high users from others, such as one research team choosing the 75th percentile (McCall & Wai, 1983) while another using 2 standard deviations above the mean (Wilson & Truman, 2002). The decision to use the top 25% or 5% of cases would have a major impact on the number of individuals identified as high users. This decision would also have a major impact on the variables found associated with high use or the factors found to predict high use.

Proportion-based definitions. High use was defined less often by selecting a small proportion of subjects with the highest hospital days, costs, or admissions and then determining their share of total utilization. For instance, Meenan et al.'s (2003) study found 0.5% of patients were responsible for 20% of total costs and 1.0% of patients accountable for 29% of total costs; McCall's (1984) study found the top 1% of survivors were responsible for 21% of all patient charges, while the top 1% of decedents were responsible for 9% of all patient charges; and Roos and Shapiro's (1981) study found 3% of patients were responsible for 47% of all hospital days of care. A one-year timeframe was most often used.

Another type of proportional definition was employed when 50% of total days, admissions, or costs were selected as the focus of interest and then the percentage of highest-use patients who accounted for this half share determined. Zook and Moore's (1980) study was the first to employ this type of definition, with 13% of patients responsible for 50% of all costs. DeCoster et al. (1997) also used it, by identifying which types of patients accounted for 50% of hospital bed days. Their study found inpatients aged 75 and older used 50% of all hospital days. Another study found 1.3% of patients used half of all hospital days accumulated over five years preceding death (Wilson & Truman, 2002). Another 50% utilization share definition is illustrated by Johansen et al.'s (1994) study, which found half of all patients admitted spent 6 or more days in hospital while the other half spent 5 or fewer days in hospital. A multi-year study employing a 50% utilization definition found 24.4% of subjects accounted for half of all Medicare Part A (inpatient care) costs accumulated in 3 years, with these persons spending 11 or more days in hospital and $\frac{3}{4}$ admitted to hospital more than once (Reuben et al., 2002).

Definition summary. High use definitions are numbers-based or proportion-based. Although proportion-based definitions were often employed, more studies used the numbers-based concept that some patients are outliers among others in a population utilization distribution. Numbers-based definitions more clearly identify high users, as high users are the persons with the highest utilization counts in utilization distributions.

The other definitional theme was the target of measurement – either hospital days of care, costs, or admissions. Of these, days of care and admissions are the most reliable and valid as they can be easily and accurately measured, and compared over time and across borders. One year was a common timeframe for measurement, with this a timeframe of much value as healthcare budgets and operational planning are essentially annualized. Reports of one year's utilization provide information more rapidly for health policy and planning as compared to longer utilization timeframes.

Factors or Variables Associated with the High Use of Hospitals

Twenty of the 21 reviewed research articles identified predictive factors or explanatory variables, ranging from 1 to 19 per paper, that were associated with the high use of hospitals. Some were common across many studies, others were identified in a few studies, and some were only identified in a single study. Qualitative-style research coding and categorizing methods were undertaken to reveal four themes among these diverse factors/variables: (a) poor health, (b) with the exception of nursing homes, other health services are also often used, (c) older age, and (d) many different highly individualized or contextualized influences.

Poor health. One research team directly reported that some people were high users of hospitals because they were seriously ill and in need of considerable health care (Roos, Burchill & Carriere, 2003), while three more found high users were in “poor” health (McFarland et al., 1985; Garfinkel et al., 1988; Reuben et al., 2002) and two more found poor self-assessed health (Roos & Shapiro, 1981; Sutton & Aliberti, 1994). One additional study found high users had a “poor” prognosis (Drucker et al., 1983). Many others revealed high users had poor health through finding multiple illnesses or co-morbidities (Drucker et al., 1983); a diagnosis of serious illnesses such as advanced cancer, end-stage renal disease, shock, and advanced dementia or senility (Anderson & Knickman, 1984; Belcher & Alexy, 1999; Hertzman et al., 1990; Johansen et al., 1994; McCall, 1984; Roos, Burchill & Carriere, 2003; Sutton & Aliberti, 1994). Other studies revealed high users had multiple tests and procedures performed in hospital (Drucker et al., 1983), unexpected complications in hospital (Zook & Moore, 1980), and a need for considerable nursing assistance as they were dependent on others or unable to perform self care (Hertzman et al., 1990; McCall, 1984; Sutton & Aliberti, 1994; Reuben et al., 2002).

Among these patients in poor health is a sub-set of terminally-ill or dying persons. Five studies reported high users died in hospital or following discharge (Drucker et al., 1983; Johansen et al., 1994; McCall, 1984; Roos, Burchill & Carriere, 2003; Shapiro, 1983). However, McCall’s (1984) study found that the top 1% of those who died in hospital were only responsible for 9% of total costs while the top 1% of those who lived were responsible for 20% of total charges. Wilson and Truman’s (2002) study found no escalation in number of hospitalizations or days of care as death neared over the five years preceding death.

One additional subset of high users in poor health was identified; multi-year high users. McCall and Wei’s (1983) U.S. study of Medicare recipients found one third of high-cost patients were high-cost patients the next year. Anderson and Knickman (1984) found people who were hospitalized one year were more than twice as likely to be hospitalized over the next three years. Wilson and Truman’s (2002) study found a small proportion of high users were multi-year high users.

With the exception of nursing homes, other health services are also often used. Three studies found high users of hospitals also used many other health services or a large quantity of another health service. Roos and Shapiro’s (1981) study of high users of hospitals in the province of Manitoba found high users of hospitals made a large number of ambulatory care (outpatient clinic or day surgery) visits. Sutton and Aliberti’s (1994) study found people who were admitted to an ER one or more times in the past year, had twice the health care costs accumulated through using a wide range of services as compared to those who were not admitted to an ER. Dendukuri et al. (2004) reported high users of hospitals, as illustrated by 11 or more days in hospital over a six month period, also had 2 or more admissions to an ER as well as 10 or more visits to a community health clinic.

No studies linked nursing homes to high use. In contrast, Roos and Shapiro’s (1981) high user study found nursing home residents had shorter hospital stays than older community-dwelling persons. Shapiro, Tate, and Roos’ (1987) study also found that although nursing home residents were more seriously ill than community-dwelling seniors, they were admitted less often to hospital.

Older persons. Only 9 of the 20 studies analyzed hospital data gathered from people of all ages. Four of these reported aging or old age as a factor for high use. Drucker et al.'s (1983) study of general surgery patients at one U.S. hospital found the majority of high cost patients were elderly. Johansen et al.'s (1994) much larger Canadian study found older age was one of only three factors associated with high use. That study found 2/3 high hospital bed days users in one province and 3/4 high hospital bed day users in another province were 60+ years of age. DeCoster et al.'s (1997) smaller Canadian study found inpatients aged 75+ accounted for 50% of all hospital bed days. Roos, Burchill and Carriere's (2003) study of hospital data gathered in one Canadian city found high users were more often older persons.

Among the 11 studies that analyzed only older people data, one found aging was a factor for high use (Roos & Shapiro, 1981). In contrast, a similar study found younger seniors had longer hospital stays than older seniors (Shapiro, 1983). Another study found seniors with end-stage renal disease had higher costs than very old seniors (McCall, 1994).

Among the studies that found older age or aging was a factor for the high use of hospitals, was a subset of studies showing inappropriate use of acute care hospital beds. DeCoster et al.'s (1997) study that found inpatients aged 75+ accounted for 50% of all hospital bed days, also found 3/4 of their days were not appropriate, as acute care was not longer needed. DeCoster et al. also reported that one half of all days after one week in hospital were not used for acute care. Two other studies found high users were waiting for placement in a nursing home or a rehabilitation hospital (Hertzman et al., 1990; Shapiro, Tate & Roos, 1987). Evans et al.'s (1989) time-series study found people 75 years of age or older were increasingly having longer extended care hospital stays. Belcher and Alexy's (1999) study found 19% of older high-use inpatients were discharged to a nursing home.

Many different highly individualized or contextualized influences. Variables/factors associated with high use were often identified in only one study, including: Harmful personal habits (Zook & Moore, 1980), the winter season (McCall & Wai, 1983), legal issues and accessible technologies reduce the possibility of withholding or withdrawing treatment (McCall, 1984), psychological distress (McFarland et al., 1985), black race (Belcher & Alexy, 1999), low serum albumin or iron (Reuben et al., 2002), less than weekly participation in religious services (Reuben et al., 2002), lives in a rural area (Wilson & Truman, 2002), and low income (Roos, Burchill & Carriere, 2003). These diverse influences suggest high use is individualized or context based. This observation may also explain why some influences were significant in one study and then not in another. Two studies found male gender associated with high use (Roos & Shapiro, 1981; Shapiro, 1983), while a larger study found female gender associated with high use (Johansen et al., 1994). Sutton and Aliberti (1994) who found HMO members who lived alone had higher costs than people who lived with someone, but also that hospital admissions were higher among persons who lived with someone than among those who lived alone.

Systematic research literature review conclusion. Many factors/variables have been associated with the high use of hospitals, although most are of questionable validity given the considerable span of research and other research quality issues. Regardless, the four themes among these influences provide insight into why some people are high users. High users of hospitals appear to be primarily in poor health and thus also use, with the exception of nursing homes, other health services. Although high users may more often be older, high use

also appears to be individualistic or context-based.

Considerable variance in the operational definitions of high use was also found across the 21 studies. This variance is explained in part the fact that high users have not been the focus of concerted research. It is of concern that each definition could potentially identify a different set of persons as high users. The number of people who are identified as high users could therefore also vary considerably, with both issues having an impact on the factors/variables associated with high use.

Table 1. Summary of Systematically Reviewed Research Articles (by publication year)

Author(s) (Year) Study Country	Research Purpose	Research Methods	Findings
1. Zook & Moore. (1980). U.S.	To develop a profile of high-cost users of medical care.	- analysis of 1976 hospital data for randomly chosen patients from 6 U.S. hospitals (n=2,238). - High-cost patients had charges equal to all lower-cost patients.	- high-cost patients comprised 13% of all patients. - Potentially harmful personal habits were associated more often with high-cost patients than low-cost ones (i.e. drinking and smoking). High-cost patients also had more unexpected complications in hospital.
2. Roos & Shapiro. (1981). Canada (Manitoba)	To explore high health care utilization by elderly persons.	- Manitoba Longitudinal Study of Aging (1970-72) healthcare utilization findings for an elderly sample (n=4,805). - Very high ambulatory visits defined as 14 or more in a 2-year period and high ambulatory visits defined as 7-13 in a 2-year period. - High hospitalizations or hospital days were not defined, although high and low users of hospitals were referred to.	- 3% admitted the first year used 47% of all hospital days by seniors, and 5% in the second year used 59% of all hospital days. - 10% of seniors used 78% of all hospital days over a 2 year period. - Seniors with high ambulatory visits were much more likely to be hospitalized. - 68% were never admitted in the 2 years, while 18% were admitted once, and 3% were admitted more often with their use accounting for 31% of all admissions. - factors associated with use: Aging was related to hospital use in general (admissions and days), males were more likely to be hospitalized and to have longer stays, nursing home residents had shorter hospital stays, and poor self-rated health was associated with hospital admissions.
3. Drucker, Gavett, Kirshner, Messick & Ingersoll. (1983). U.S.	Study of "high cost general surgical patients as a potential source of leverage for containment of hospital costs" (p. 284)	- analysis of one hospital's 1980 data (N=3,935 patients). - Higher-cost patients were those costing more than \$20,000; high-cost patients accounted for ¼ charges and days in hospital.	- 6.6% of patients (n=261) had total charges of \$20,000 or more, with these persons accounting for 32% of all general surgical charges and hospital care days. - 85 high-cost patients (4.2%) accounted for 26.8% of charges and 27.6% of hospital days. Their charges were 8 times the average; 22.3% died in hospital and 49.4% were dead within 2 and ½ years; 40 were considered complex with multiple illnesses and multiple annual admissions; the majority were elderly and with poor prognoses. - high-cost patients normally had many procedures performed.

4. Shapiro (1983) Canada (Manitoba)	Compare hospital utilization patterns of elderly survivors and decedents.	<ul style="list-style-type: none"> - Manitoba Longitudinal Study on Aging, administrative data (1970-77) analysis comparing physician and hospital data for 3,169 seniors to examine patterns in hospital use by decedents and survivors. - 18 days or more in hospital in one year differentiated higher from lower users. 	<ul style="list-style-type: none"> - 5% of the elderly who died accounted for 20% of all hospital days by elderly subjects. - Impending death was associated with a substantial rise in the odds of being hospitalized and of using more than 18 hospital days (and becoming a high hospital user). - hospitalized younger decedents had longer stays than older ones. - Males had longer stays. - No other factors were associated with high hospital utilization, with the researcher indicating that little is known about the factors that affect hospital use or non-use, and little is known about the extent to which factors affect the length of hospital stays.
5. McCall & Wai. (1983). U.S. (Colorado).	To examine the use of and need for health care services for seniors, with a focus on senior subgroup use of health services over time.	<ul style="list-style-type: none"> - analysis of data collected from a 3% random sample of aged Medicare recipients in Colorado, 1975-78 (n=4,536). - High users defined as those who used more than the amount (cost) associated with the 75th percentile of use for the year. 	<ul style="list-style-type: none"> - 18% of beneficiaries accounted for 88% of the service costs. - some beneficiaries had consistent high costs, and others had consistent low costs; with 1/3 continuing to be high-cost patients the next year. - Hospital costs were lower in July, August and September; both seasonal and year-to-year trend variables were identified as having an important role in utilization as measured by costs accumulated over a year.
6. McCall. (1984). U.S. (Colorado).	Examine utilization and costs of Medicare services by beneficiaries in their last year of life	<ul style="list-style-type: none"> - analysis of administrative data for all Medicare beneficiaries in Colorado in 1978 (n=10,766) and a random sample of live beneficiaries. - top 1% of annual charges defined high use. 	<ul style="list-style-type: none"> - 88% of all care charges in last year of life were for hospital-based care; 30% were never hospitalized in the last year of life. - top 1% of survivors consumed 21% of charges, while the top 1% of decedents consumed 9% of charges, with charges varying considerably among decedents. - Charges per deceased senior were 6.6 times higher on average than the randomly selected senior beneficiaries. - For older decedents, 67% of all charges were within the last 3 months of life, with the majority of these charges (62%) for in hospital and intensive care. - Decedents with end-stage renal disease had higher costs than “aged” decedents. - Accessible technologies and legal issues were identified as factors in the high cost of end-of-life care.

7. Anderson & Knickman. (1984). U.S.	Examine temporal patterns of care for high users of hospitals, i.e. are high users one year more likely to be high users in subsequent years?	<ul style="list-style-type: none"> - analysis of 1974-77 data from 204,917 randomly-selected Medicare patients. - two definitions of high use: (a) any Medicare beneficiary with Medicare expenditures exceeding \$10,000 in 1974, and (b) any person with \$5,000+ health care expenditures. 	<ul style="list-style-type: none"> - individuals hospitalized in 1974 were twice as likely to be hospitalized in 1975, 1976, and 1977. - 749 individuals (0.3% of persons with 6.7% of total costs) had \$10,000 expenditures in 1974, 33 times the average amount of \$465 for both users and non-users of health care, and 3,956 persons had expenditures over \$5,000 in 1974. - two groups of high 1974 users had higher costs in next 3 years. - persons with renal failure were the highest cost patients.
8. McFarland, Freeborn, Mullooly & Pope. (1985) U.S. (Northwest)	Explore different patterns of utilization, including high use.	<ul style="list-style-type: none"> - analysis of data from 270,000 persons, with a sample of 1,401 selected from 1967-73 data. - high users were in the top quartile of use over this 7-year period. - consistent high users were those with 5 or more years of high hospital utilization in these 7 years. 	<ul style="list-style-type: none"> - 13% were consistent high users of outpatient medical care services, and these accounted to 31% of total doctor office visits, 35% of total hospital admissions, and 30% of total outpatient surgical services. - their most common health problem was the treatment or follow up of chronic conditions. - utilization was unrelated to marital status, age, smoking, alcohol use, income, occupation, and perceived social class. - high users were more likely to perceive themselves as in fair or poor health, and to report a higher number of physical symptoms. - high users also had a high degree of psychological distress, including depression.
9. Shapiro, Tate & Roos (1987) Canada (Manitoba)	Investigate the impact of nursing homes on hospital use.	<ul style="list-style-type: none"> - analysis of 1971-77 data collected on all Manitoba Longitudinal Study of Aging subjects, and the general senior population of Manitoba. - compared 2-year hospital use patterns prior to and following nursing home admission, and compared use by nursing home residents and seniors living in the community. - 31+ hospital stays were high use, as hospitals are short-term facilities with stays expected to be 30 days or less. 	<ul style="list-style-type: none"> - nursing home residents were older and sicker than the community-dwelling seniors, but hospital admissions were less than expected when compared to community-dwelling seniors. - hospital stays were similar for nursing home residents and community-dwelling seniors. - prior to nursing home placement, the odds of seniors being a high user with 31+ stays was 5 times that of seniors not admitted to a nursing home. - in the year prior to nursing home admission, most were hospitalized for 31+ days.

10. Garfinkel, Riley & Iannacchio (1988) U.S.	Describe high users of national health care expenditures .	- 15,189 non-institutionalized Americans who responded to a 1980 insurance claims survey. - persons who accounted for a disproportionately large share of all medical charges was focus, although the percentage who accounted for a high proportion of costs was chosen in multiples of 5 (10% or 15%).	- 15% of aged 65+ subjects accounted for 79% of all reported charges for seniors. - 97% of seniors who had 1+ hospital stays were high-cost patients, and 10% of non- seniors accounted for 73% of total non- senior health care costs. - poor health status (a higher number of chronic conditions, restricted-activity days, and/or functional limitations) and having both Medicaid and private insurance coverage distinguished high senior users.
11. Evans, Barer, Hertzman, Anderson, Pulcins & Lomas (1989) Canada (BC)	Examine the increasing use of hospitals by elderly persons.	- comparisons of administrative data collected on all persons discharged alive or deceased from a public acute care, extended care, and rehabilitation hospital in BC in the years 1969, 1978, and 1985/86. - analyses focused on days of care, by age, died or not, and place of care. - 61+ days in hospital each year was identified as higher utilization.	- the average stay increased 20% over the 16 years, except for a 16.8% decline in stays for acute care and rehabilitation patients. - in 1985/86, 2% of patients (all with 61+ day stays) accounted for ½ of all days, while 98% of patients who stayed 60 days or less only used acute care hospitals; persons aged 65+ (who stayed 61+ days) accounted for 12.5% of total days in 1969 and 39% of total days in 1985/86, with aging identified as a factor. - persons aged 75+ were higher users in 1985/86 as compared to 1969, due to longer stays in extended care beds. - dying was a factor; in 1985/86, 1 in 200 (0.5%) patients were responsible for ¼ patient days (and all 200 died).
12. Hertzman, Pulcins, Barer, Evans, Anderson & Lomas (1990) Canada (BC)	Explore diagnoses contributing to greatest number of patient days of increase among the elderly.	- analysis focused on days of care by diagnosis. - 61+ days per year in an acute care/ extended care/ rehabilitation hospital was identified as higher utilization.	- a few select diagnoses were identified as having contributed the most to an increase in the use of extended care and other types of hospital beds by seniors living in BC: (a) dementia or senility, (b) chronic cardiovascular disease, and (c) waiting placement.

<p>13. Sutton & Aliberti (1994) U.S.</p>	<ul style="list-style-type: none"> - Identify characteristics of high-cost older adults newly enrolled in an HMO. - Test a self-administered survey that questioned new HMO members on areas of interest. 	<ul style="list-style-type: none"> - survey data from 7,806 respondents were linked with claims data for hospitalizations, outpatient surgery, home health care, ambulance services, ER services, and durable medical equipment use (paid by HMO). - compared hospital admissions and other data for the year prior to and year following enrolment. - indicated some were higher users. 	<ul style="list-style-type: none"> - health care costs and hospital days increased with worsening self-perceptions of health. - hospital admissions was 3 times higher among seniors with multiple chronic conditions. - persons with functional disabilities had higher inpatient care costs, as the 3% who needed assistance with bathing had 5 times higher costs than others independent in bathing. - seniors who were admitted to an ER one+ times in the prior year also had more than twice the health care costs than those who were not admitted to an ER. - seniors who received home health care in the prior year also had more than twice the health care costs as those who did not receive home health care. - HMO members who lived alone had slightly higher health care costs than those who lived with another person, although the number of hospital visits was higher among persons who lived with someone than among persons who lived alone.
<p>14. Johansen, Nair & Bond (1994). Canada (Saskatchewan and New Brunswick)</p>	<p>Investigate high users of hospital days, answer question: What are the characteristics of persons who use the most hospital days?</p>	<ul style="list-style-type: none"> - analyses of hospital data collected on each person hospitalized in 1989/90 year. - the 10% who used half of all hospital days of care that year and all persons admitted 4 or more times that year were defined as high users. 	<ul style="list-style-type: none"> - 11-12% of all citizens in the two provinces were admitted to a hospital that year, with 4% admitted 4+ times and cancer the most common diagnosis among these high users. - half of all admitted spent 5 or fewer days in hospital; 14% of all days were accounted for by 1% of users, 35% of days were accounted for by 5% of users, and 49% days accounted for by 10% of users (who represent 1% of the general population); psychosis, senility, pneumoconiosis, and diseases of the sensory and nervous systems such as Parkinson's and MS accounted for the most days. - 2/3 and 3/4 of high day users in the two provinces were 60+ years of age. - 55% and 57% of high day users in the two provinces were female. - high users often died in hospital. - high day users were frequently admitted (50% of high day users were admitted 3+ times; high day users had 20% of separations). - high users often had many diagnoses and many procedures. - modelling found high users were distinguished by older age, death in hospital, and having multiple diagnoses and procedures.

15. DeCoster, Roos, Carriere & Peterson. (1997). Canada (Manitoba)	Investigate possibility of inappropriate hospital use by inpatients receiving care for medical conditions.	<ul style="list-style-type: none"> - analyses of hospital data for all persons in province hospitalized in 1993/94; excluding obstetrical, surgical, and psychiatric patients. - persons who used half of all hospital days of care defined as high users, although number of admissions and stays over 27 days also assessed. 	<ul style="list-style-type: none"> - inpatients aged 75+ accounted for 50% of all hospital days, although 74.8% of these days were inappropriate as they no longer required acute care. - 5% of patients stayed 28+ days; they accounted for 36% of all days for medical patients; one half who stayed over one week no longer needed acute care. - nervous system, circulatory, digestive, and respiratory diagnoses accounted for 60% of admissions and 59% of all days.
16. Belcher & Alexy. (1999). U.S. (Southwest US)	Develop patient profiles of high-resource user Medicare groups in inpatient and ERs in a 222 bed rural hospital and an affiliated home health agency.	<ul style="list-style-type: none"> - all persons aged 65+ using one hospital in 1995-96 (comprising 44% of hospital payments from 2,502 admissions and 2,418 ER visits). - high users had multiple inpatient admissions or ER visits that year, with 3+ inpatient/ ER visits identified as high use and 6+ identified as highest users. - length of stay outliers, with longest stays, were also identified as high users. 	<ul style="list-style-type: none"> - visits/admissions ranged from 1 to 14 per individual; the highest user group (6+ visits/admissions) was comprised of 75 individuals, with 13% dying, 19% discharged to a nursing home, and 65% discharged to a private residence. - Highest visit users were most often admitted for health failure/shock, COPD, chemotherapy, and pneumonia; race (black persons) was the only socio-demographic variable to differentiate 75 highest visit users (75% black) from lower (49% white) visit users. - 6% (n=148) of all admitted had a long stay (19+ days); long-stay patients more often had cancer or respiratory diseases, were older (mean 78.9 years) and married.
17. Reuben, Keeler, Seeman, Sewall, Hirsch & Guralnik. (2002). U.S.	Develop a method to identify seniors at high risk for high hospital utilization.	<ul style="list-style-type: none"> - analyses for the years 1981-92, with predictive multivariate models comparing hospital data with self report data or combined hospital/self-report data. - all 5,138 subjects were 71+ years old. - high user defined as having 11+ days in hospital over a 3-year period, with these in the top quartile of use. 	<ul style="list-style-type: none"> - 24.4% were hospitalized 11+ days, with these high users accounting for half of all Medicare Part A (inpatient care) costs, and 3/4 admitted to hospital more than once. - significant factors for high use: 7 physical examination findings (depression score, mental status score, impaired vision, gait speed, quartile of performance on test of gait speed, tandem stand, and chair stand), 10 self-report items (any hospitalizations in last year or prior year, gender, fair or poor health, not working, less than weekly participation in religious services, needing help with bathing, unable to walk half a mile, diabetes, taking loop diuretics) and 2 lab tests (low serum albumin and iron).

18. Wilson & Truman (2002) Canada (Alberta)	Explore and describe the last hospital stay ending in death, and investigate the use of hospitals over the last 5 years of life.	<ul style="list-style-type: none"> - analyses of hospital data for 7,429 persons who died in hospital in 1996/97 year. - ultra-high users identified by: (a) 17+ admissions to hospital in 5 years, (b) 291+ hospital days in 5 years, and (c) 34+ procedures performed in 5 years (all 2+ standard deviations above the mean). 	<ul style="list-style-type: none"> - hospital use varied, with 44.3% of deaths in this province taking place as hospital inpatients, and the last stay typically short and infrequently resource intensive. - 3.8% were identified in one or more ways as ultra-high users in the 5 years before dying in hospital. - 2.1% had ultra-high admissions to hospital (17 or more), with 27.3% of patients accounting for half of all admissions to hospital. - 1.1% had ultra high days (291+) of care, with 1.3% of inpatients accounting for half of all days. - 1.1% had an ultra high number of procedures (34+) performed in 5 years, with 21.4% of inpatients accounting for half of procedures. - Age, gender, and type of illness did not distinguish high users; but 3/4 ultra-high users were rural residents with 3/4 of their hospitalizations in small rural hospitals.
19. Roos, Burchill & Carriere (2003) Canada (Winnipeg Manitoba)	Gain better understanding of high hospital use. 1. Is there a socio-economic gradient among the highest users? 2. How do the characteristics of the highest users vary by income, age, near death state, and gender?	<ul style="list-style-type: none"> - analyses of 1995/96 data for entire population of Winnipeg city (N=600,000), focusing on total number of days in hospital accumulated by each individual, examining high users by income groups, age, and gender. - high use was operationalized as 1% of an entire population who may use city hospitals. 	<ul style="list-style-type: none"> - 87.4% were not hospitalized that year; 1% of public who were high users accounted for 12.6% of patients hospitalized that year. - these 6,487 people used 69% of all hospital days; their average and median stays were 71 and 78 days, with admissions and median days similar among them. - the lowest income group (20% of patients) were responsible for 31.5% of high user days, the highest income group (20% of patients) provided 10.4% of high user days. - one half of high users had cancer, cardiac, circulatory, or psychiatric health problems; females and older people were more often high users. - 71-72% of high users were alive at year end and 28-29% died; with acuity of illness primarily responsible for high use.
20. Meenan, Goodman, Fishman, Hornbrook, O'Keefe-Rosetti & Bachman (2003) U.S.	Examine ability of available risk models to identify high-cost individuals and enrollee groups.	<ul style="list-style-type: none"> - analyses of 1995/96 administrative data for 2.4 million persons in 5 HMOs, focused on highest-cost clients, with the top 0.5-5% identified as high-cost or highest users (i.e. persons of most interest). 	<ul style="list-style-type: none"> - expense distributions were highly skewed, the most expensive 0.5% and 1% of cases represented 20% and 29% of all expenditures. - The 1% high-cost clients were over the threshold of \$19,756. - Two of the 5 models predicted 26-30% of the health care dollars used by the highest 1% and 0.5% of clients respectively.

21. Dendukuri, McMusker, & Belzile. (2004) Canada (Montreal)	Develop a tool to identify seniors at risk of health services utilization.	- analyses of data for 1,122 seniors who visited a Montreal hospital ER in 1996-99. - high use defined as 90 th percentile for total number of days in hospital, visits to community health centers, and visits to ERs.	- high users had 11 or more days in hospital, as well as 2 or more visits to an ER, and 10 or more visits to a community health centre in the six months following the initial ER visit. - depression was suggested as a factor for high use, but was not tested in this study.
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2. Hospital Utilization Study to Identify and Describe High Users

In mid-2006, four large datasets comprised of all data routinely collected on every inpatient and ambulatory patient admitted to two full-service acute care hospitals in a large city in the province of Alberta were provided to the principal researcher for analysis. These datasets contain information identical to other hospital utilization data collected routinely by provincial/territorial governments across Canada (Canadian Institute for Health Information, 2009). Although no information that could result in any patient being identified was provided to the researcher, research ethics approval was applied for and received. Following this, a descriptive-comparative analysis of data was conducted to examine patient and utilization trends, including the identification and description of high users. The following report of this study is divided into four sections: (a) purpose and objectives, including research questions for the high user aspect of this study, (b) research methods employed to study high use and the decision rationales for these methods, (c) high-user findings, confined largely to the most current fiscal year (2005-2006), and (d) a discussion of findings.

Quantitative Research Study Purpose, Objectives, and Research Questions

The purpose of this secondary analysis of complete health services utilization and patient data collected at two hospitals in one city was to identify established or emerging patterns in recent years in patients and hospital utilization. Two objectives guided this research: (1) explore and describe patient trends: (a) in recent years, (b) by site, and (c) on the basis of age at time of service, and (2) explore and describe hospital utilization trends: (a) in recent years, (b) by site, and (c) on the basis of age at time of service. The specific research questions pertaining to high users were:

1. What proportion of patients each year and all years combined are high users of: (a) inpatient hospital beds, (b) ERs, (c) daysurgery clinics, and (d) outpatient clinics?
2. What age, gender, residence, and diagnosis trends are evident among these high users?
3. Are the high users of one service more likely to be high users of another service?
4. Are the persons who are high users one year high users in other years?

Quantitative Research Methods

All patients who received inpatient and/or ambulatory care at the two hospitals in recent years were included in this study. Both hospitals are mid-sized (250-300 beds) and full service with 24-hour ERs, operating rooms, intensive care units, coronary care units, and inpatient care units. Both have active daysurgery clinics and outpatient clinics for a wide range of same day diagnostic and therapeutic procedures. One hospital is older but both are modern facilities striving for high quality and cost-effective care. The same faith-based

management group operates these two publicly-funded facilities (among others) in Alberta.

As the same patient and utilization data are collected at both hospitals, complete annualized patient and utilization data were requested from both. Data from two hospitals were preferable to data from only one, as not only were a larger number of subjects gained, but the findings from the two hospitals could be compared and contrasted for enhanced research quality. All data were individual-anonymous, with a consistent unique identification number provided by the agency for the same individual within and across the four datasets:

1. Inpatient hospital dataset containing information on all admissions and subsequent inpatient care records over 11 years - 1995/96 through 2005/06.

2. Emergency room (ER) dataset containing information on all admissions and subsequent ER records over 11 years - 1995/96 through 2005/06.

3. Daysurgery dataset containing information on all admissions and subsequent daysurgery records over 9 years - 1997/98 through 2005/06.

4. Outpatient clinic dataset containing information on all admissions and subsequent outpatient records over 7 years - 1999/2000 through 2005/06.

High User Data Analysis Decisions

As the systematic literature review had revealed high users of inpatient beds could also be high users of other health care services, the first decision was to report on high users in each of the four service areas. The second was to focus on the number of admissions each year to each service area, the length of stays when admitted to an inpatient bed, and total hospital bed days accumulated by individuals over each fiscal year (April 1 through March 31). These decisions were made as every admission to every service area is resource intense. Admission bloodwork and other diagnostic tests are done, with many other activities requiring health human resource investments of time and energy. Each day in hospital is also impactful, as no other patient can be admitted to an occupied bed. Another decision after exploring the data by using all definitions previously identified in the systematic literature review was to use a numbers-based definition of high use. High users were identified as those with total utilization counts over one year that were two standard deviations above the mean. As all utilization distributions were found to be extremely skewed, two standard deviations above the mean resulted in the top 5% of utilization counts in each distribution identifying a distinct number and proportion of patients as high users. High users could then be clearly described and compared against the other patients.

Multiple utilization distributions were created, with each summarizing one year of select data for each hospital. High users in each distribution were identified. The findings from the two hospitals were compared and the data merged as the findings were similar if not identical. Distributions were again created and high users each year again identified, with these findings compared with the separate hospital findings as a research quality measure. Year to year comparisons were then done as another research quality measure, with the findings of one year found to be similar or identical to the next year. The final analyses occurred after all data from the four datasets were merged into an all-years dataset to determine if high users of one service were high users of other services and if multi-year high use occurred.

All analyses were undertaken after data cleaning and manipulation were undertaken to permit the planned analysis using the most recent versions of ACCESS and SPSS. In

keeping with the analysis methods used in most past high user research studies, relatively simple descriptive-comparative statistical tests appropriate to the data examined and research question were used. With some exceptions, only those findings for the most current year (2005-06) are presented below to conserve space, with these findings similar to those of previous years.

Quantitative Two-hospital Research Findings

High Users of Inpatient Hospital Beds

As shown in Table 2, 3.5% of all 30,171 patients who were admitted one or more times to hospital in the 2005-06 year accumulated 35+ inpatient care days, a figure 2 SDs above the mean (6.34). These high users accounted for 35.0% of all 191,351 hospital care days that year. Among all patients, their total care days ranged from 1 to 312, with counts truncated at fiscal year boundaries. Similarly, 3.7% of all individuals hospitalized had a hospital stay episode of 30+ days, a count that is 2 standard deviations (SDs) above the mean stay of 4.97 days. Among all patients that year, their hospital stays ranged from 1 to 159 days in length. The mean length of stay for younger persons that year was 3.4 as compared to 10.6 for older persons. Finally, 9.2% of all those admitted were hospitalized 2+ times that year, a figure 2 SDs above the mean (1.1). These high users accounted for 18.4% of all 33,599 admissions that year. Hospital patients that year were admitted 1 to 10 times each.

High Users of Other Hospital Services

As illustrated in Table 2, in 2005-06, 4.1% of all 68,490 individuals who were admitted to an ER in the two hospitals were admitted frequently, each with 4 or more ER visits that year, a figure 2 SDs above the mean of 1.5. These persons accounted for 16.1% of all 99,449 ER visits that year. In contrast, only 48 persons or 0.4% of all 10,897 persons admitted for daysurgery were admitted 4 or more times, a figure 2 SDs above the mean number of 1.1. These persons accounted for 6.6% of all 12,077 daysurgery visits that year. The vast majority of patients admitted for daysurgery were only admitted once (95.8%), with daysurgery admissions ranged from 1 to 57 per person that year. Also in that year, 1.6% of all 88,332 persons admitted to an outpatient clinic at the two hospitals were high users. Each was admitted 22 or more times that year for outpatient care, a figure 2 SDs above the mean of 3.0. These persons accounted for 26.5% of all 268,021 outpatient clinic visits that year.

Table 2. High Users – Number and Proportion of Total Patients, by Hospital Care Site

Care Site	High Users, Most Current Year Only – 2005-06		
	High Users N (%)	Total Patients N	High Use Marker
Inpatient - admissions per year	2,764 (9.2)	30,171	2+
Inpatient - days total per year	1,053 (3.5)	30,171	35+
Inpatient - long stays	1,125 (3.7)	30,171	30+
ER - visits per year	2,809 (4.1)	68,490	4+
Daysurgery - visits per year	48 (0.4%)	10,897	4+
Outpatient clinic - visits per year	1,402 (1.6)	88,332	22+

High Users Described

Age. As illustrated in Table 3, in the most current (2005-06) year, 2/3 high users through multiple admissions to hospital were under the age of 65. An even greater proportion of high users of ERs, daysurgery clinics, and outpatient clinics were younger persons; only 13.9% to 29.2% of these high users were 65 years of age or older. The two exceptions to younger persons being the predominant high user were long hospital stay high users and accumulated days in hospital high users; approximately 60% of these high users were older. These age findings among high users were similar to the age findings among all persons admitted that year and each other year. Over all data years combined, 81.1% of all persons admitted to a hospital bed were under the age of 65, as were 85.7% of ER visitors, 78.5% of outpatient clients, and 90.8% of daysurgery patients.

Gender. As illustrated in Table 3, females were more typical high users of hospital services. The female proportion ranged considerably, however, from just over half (53.0%) of ER high users to nearly 3/4 (70.8%) daysurgery clinic high users. These gender findings among high users were similar to the gender findings among all persons admitted that year and each other year. Over all data years combined, 71.4% of patients admitted to a hospital bed were female, as were 50.8% of ER visitors, 56.1% of outpatient clients, and 56.9% of daysurgery patients.

Geographic Residence. Table 3 also shows residents of the city where the two hospitals are situated were the more typical high users. This proportion ranged from 78.1% of those admitted 2+ times to hospital to 95.4% of those who visited an ER 4+ times that year. A surprising large proportion of high users did not live in the city where the two hospitals were located. These findings were similar to the residence findings for all persons admitted that year and each other year. Over all data years combined, 69.5% of patients admitted to a hospital bed lived in the city where the two hospitals were located, as were 87.6% of ER visitors, 76.6% of outpatient clients, and 66.2% of daysurgery patients.

Diagnoses. Table 3 also outlines the most common diagnoses among high users, with all diagnoses that account for 5% or more of cases shown. Mental illness comprised the most common diagnosis for the high users who had long hospital stays (29.7%) and for the high users who had many accumulated care days in hospital (27.1%). Mental illness was the second most common diagnosis among high users of daysurgery clinics (31.3% of all high users of daysurgery clinics had a diagnosis of mental illness). Mental illness was the fifth most common diagnosis among high users who had been readmitted to hospital; following complications of pregnancy, childbirth, and the puerperium; diseases of the digestive system; and diseases of the circulatory system. The non-specific “factors influencing health status and contact with health services” was the most common diagnosis among high users of outpatient clinics, with mental illness the second most common diagnosis. The greatest variance in diagnoses was found among ER high users; factors influencing health status and contact with health services was the most common diagnosis; followed by symptoms, signs, and ill-defined conditions; injury and poisoning; diseases of the nervous system and sense organs; diseases of the digestive system; diseases of the respiratory system; and then mental illness.

Table 3. Age Distribution, Gender, and Region of Residence for High Users in 2005-06

Care Site	High Users, Last Year Only – 2005-06			
	Younger (%)	Female (%)	Resident of City (%)	Most Common Diagnoses (% of all high users)
Inpatient - admissions	66.8	63.0	78.1	Complications of pregnancy, childbirth or puerperium (18.8) Diseases of digestive system (13.3) Diseases of circulatory system (8.5) Mental illnesses (8.3) Diseases of respiratory system (8.1) Factors influencing health status and contact with health services (8.0) Neoplasms (7.1) Injury and poisoning (5.7)
Inpatient – total days	40.4	58.6	84.5	Mental illnesses (27.1) Diseases of circulatory system (10.2) Diseases of respiratory system (9.6) Diseases of digestive system (9.4) Factors influencing health status and contact with health services (9.3) Injury and poisoning (5.9) Neoplasms (5.5)
Inpatient - long stays	39.6	57.8	88.4	Mental illnesses (29.7) Factors influencing health status and contact with health services (11.0) Diseases of circulatory system (10.6) Diseases of respiratory system (8.5) Diseases of digestive system (7.3) Neoplasms (5.6) Injury and poisoning (5.2)
ER – visits	76.8	53.0	95.4	Factors influencing health status and contact with health services (23.1) Symptoms, signs, and ill-defined conditions (15.2) Injury and poisoning (11.0) Diseases of nervous system and sense organs (8.7) Diseases of digestive system (7.8) Diseases of respiratory system (6.6) Mental illnesses (5.0).
Daysurgery – visits	70.8	70.8	79.2	Factors influencing health status and contact with health services (65.2) Mental illnesses (31.3)
Outpatient clinic - visits	80.8	53.9	86.5	Factors influencing health status and contact with health services (53.8) Mental illnesses (39.4)

High Users Across Consecutive Years

Additional analyses revealed only a very small percentage of patients were high users of one hospital service over two consecutive years. None were high users of a service over three or more consecutive years. Among those patients who were high users through multiple inpatient admissions, only 702 persons or 0.3% of all patients were high users over two consecutive years. Of these, 62.0% were younger than 65 years of age, 59.5% were female,

84.9% were from the city where the two hospitals were located, and 88.1% had a primary diagnosis of mental illness. Similarly, among all persons who were identified as a high user of inpatient services through total inpatient care days accumulated in one year, only 727 persons or 0.3% of all patients were high users for two consecutive years. Among these 727 persons, 69.6% were younger than 65, 66.9% were female, 86.1% were from the city where the two hospitals were located, and 79.2% had a diagnosis of mental illness. In addition, among all persons who were identified as a high user of inpatient services by long stay episodes, only 242 persons or 0.1% of all subjects were identified as having been a high user for two consecutive years. Among these 242 persons, 59.6% were younger than 65, 56.9% were female, 89.9% were from the city where the two hospitals were located, and 75.3% had a mental illness diagnosis.

Similarly, among all persons who were identified as a high user of ERs, only 648 or 0.1% of all patients were identified as having been a high ER user for two consecutive years. Among these 648 persons, 94.3% were younger than 65 years of age, 73.9% were female, 95.5% were from the city where the two hospitals were located, and 51.1% had a diagnosis of mental illness. Among all persons who were identified as a high user of daysurgery services, only 22 or 0.001% of all subjects were identified as having been a high user over two consecutive years. Among these 22 persons, all (100%) were under the age of 65, 72.7% were female, 95.5% were from the city where the two hospitals were located, and 95.0% had mental illness as their primary diagnosis. Among all persons who were identified as a high user of outpatient clinics through multiple visits, only 292 or 0.3% of all subjects were identified as having been a high user of daysurgery clinics over two consecutive years. Among these 292 persons, 88.4% were under the age of 65, 63.4% were female, 87.3% were from the city where the two hospitals were located, and 52.7% had a mental illness diagnosis.

High Users of Multiple Hospital Services

Only 277 persons out of all 1,308,186 subjects (0.02%) within the four multi-year datasets were high users of two or more services in the same year. Of these 277 high users, 86.0% were younger than age 65, 60.8% were female, and 88.8% lived in the city where the two hospitals were located. Their most common diagnosis was mental illness (79.1%), followed by diseases of the circulatory system (10.2%). Mental illness was the primary diagnosis for 88.4% of all younger multiple high users, while diseases of the circulatory system was the most responsible diagnosis for 51.4% of older multiple service high users.

Of these 277 persons, 272 (97.8%) were high users of two services, specifically: (a) ER and inpatient admissions (n=111), (b) outpatient and daysurgery clinic visits (n=71), (c) outpatient clinic and ER visits (n=56), (d) outpatient clinic and inpatient admissions (n=17), (e) daysurgery clinic and inpatient admissions (n=10), and (f) daysurgery clinic and ER visits (n=7). Five persons were high users of three services: (a) outpatient clinic, ER, and inpatient admissions (n=3) and (b) outpatient clinic, daysurgery, and inpatient admissions (n=2).

Discussion of Quantitative High User Research Findings

Many findings of interest were identified in this study of complete routinely-collected data over multiple years from two full-service acute care hospitals. One of the most clearly evident findings is that females were more typical high users. This is not the first study to

show females are hospitalized more often and not the first to suggest important differences between males and females in health, types and severity of illnesses, life circumstances, support or care needs, and health service appropriateness (CIHI, 2009; Jegen, 2008).

With the exception of high users by long hospital stays and many accumulated hospital days in one year, another consistent and important finding was the predominance of younger persons as high users, including multi-year and multiple-service per year high use. This age-based pattern is at considerable odds with the common view that younger people are typically healthy and thus minimal or non-users of hospitals, and the corresponding view that older people are ill and high users of hospitals. It is also striking that mental illness was often identified as their primary diagnosis. A report by CIHI (2008b) that focused on mental illness in Canada found readmissions to hospital were common, with the concern raised that readmissions suggest hospital stays are not long enough to stabilize serious mental illnesses.

Mental illness was also a common diagnosis among patients who were high users through long stays or many accumulated days each year in hospital. Six of every 10 of these types of high users were older persons, a finding in keeping with other high use studies that show older persons tend to have longer stays and a higher number of accumulated bed days (Drucker et al., 1983; Evans et al., 1989; Johansen et al., 1994), with other studies finding older persons have longer average hospital stays (CIHI, 2009). This pattern of high bed days use of hospitals could support what DeCoster et al. (1997) previously reported – that a large proportion of inpatient care days that follow one week in hospital are for non-acute care. The longer stays and more inpatient days accumulated over a year may simply reflect a need for more home care to allow earlier discharge, a change in the residency criteria of group homes to permit seniors in reduced health to return, and a need for more nursing home, hospice, and rehabilitation beds.

The final key point is that in most cases only a very small proportion of patients were high users, most of who suffered from a mental illness, and high users were responsible for a disproportionately large share of hospital services. This conclusion indicates that it is extremely important to focus attention on high users, and consider these persons as special interest costs whenever health policy and service planning occurs.

3. Qualitative High User Study

Following the discovery that younger mentally-ill adults were the more common high users of hospitals through multiple admissions and that one quarter of high users were older persons who had long hospital stays or many inpatient care days accumulated over a year, a qualitative study was designed. The specific purpose of this study was to learn what contributed to the considerable need for and use of inpatient hospital beds by younger readmitted mentally-ill patients and older long-stay patients. Qualitative research was deliberately used to gain needed insight into high use. Qualitative inquiry was expected to identify influences for high use that have not previously been reported and to provide additional information on factors previously identified for high use.

Qualitative Research Methodology

This qualitative study of high users was planned for the two hospitals previously studied for patient and utilization trends. Not only were these hospitals accessible to the

research team and approving of research to improve patient care, but they were also appropriate sites for data collection as they are typical of mid- to large-size acute care hospitals across Canada. One hospital has a larger inpatient (62 beds) mental health service and an outpatient mental health clinic operating 5 days each week. The other hospital has more medical (non-surgical) beds, with these beds often used by older persons with multiple co-morbidities and this hospital widely thought of as having more patients waiting for placement in a nursing home. Due to the sensitive nature of this study, and anticipated difficulty in gaining inpatients who could give informed consent, a decision was made to conduct all mental-health data gathering at one hospital and all older long-stay data gathering at the other hospital. After research ethics and hospital administrative approvals were obtained, this study was initiated as planned in early 2008 and completed in late 2008 after data saturation was reached in the two research streams.

Ethnography was the chosen method, as it is often used to understand the cultural and environmental contexts that affect people. In this ethnography, the focus was on adults aged 18 to 64 who were currently admitted for mental illness care and who had been admitted previously that year to hospital for mental illness care, and also adults aged 65 or older who had been hospitalized for at least 30 days or 35 days over multiple admissions that year. Ethnographic research investigations typically involve multiple data gathering methods employed in natural settings to gain comprehensive insightful information and also validate that information. In this study, patient interviews, family interviews, nurse and/or physician caregiver interviews, chart reviews, and observations of the patient and their hospital environment were planned.

Each week, the nurse managers of all relevant hospital units identified adult inpatients who met the utilization criteria for this study. Each potential participant was invited to take part in the study through a printed notice about the study provided to them by the nurse manager or a nurse familiar with that patient. Patients could refuse at this time to be approached by research team, with one third declining to learn more about the study and one third too ill to read the notice. All others were approached by the research team, with many of these considered too ill to participate fully in the study. Few high users were both willing and capable of signing a consent form, and were subsequently interviewed at a time and place of their choosing. Over nearly a full year, 15 younger persons with a diagnosis of mental illness (who had been admitted two or more times in 12 months) and 14 older persons admitted and with stays of 30 or more days became study participants.

Four of the 15 with a mental illness diagnosis and 6 of the 14 long-stay patients named a family member and/or health care provider to provide additional insights into their high use of hospitals. When these persons were contacted, six agreed to be interviewed: One doctor caring for a mentally-ill patient, one social worker caring for a mentally-ill patient, two nurses caring for long-stay patients, and two family members of long-stay patients. Each of these caregivers signed a consent form and was interviewed once. All patients were also interviewed once. No patients asked for a second interview, although a second was offered.

The first three interviews in both streams were conducted by the researcher and a research assistant, with one research assistant assigned to one hospital and another assigned to the other hospital. Each assistant observed the first two interviews and then conducted the third while being observed by the researcher. Both assistants were also trained previously by this researcher, as she is familiar with conducting and teaching qualitative research methods. The assistants conducted the remaining interviews and kept detailed field notes of

observations and information gained from each patient's chart and hospital unit. Four of the patients diagnosed with mental illness and two long-stay patients did not agree to have their interview audiotaped. A handwritten record of the responses from these six patients to the semi-structured set of questions asked of every patient was kept. The interviews were designed to be brief as the capacity to be interviewed was anticipated as limited among all participants. Interviews lasted between 5 and 30 minutes, with some limited by patient fatigue or inability to provide detailed information. After each interview, the participants were asked if they were comfortable with the information that they had shared, and if they were comfortable with having their provided information used for research. All agreed and their named caregivers were then interviewed to validate information provided by patients; with no new influences for high use identified but some additional insights gained.

Data coding and categorizing was carried out by the research team on a monthly basis, with patient and caregiver interviews continuing until saturation, a point where no new influences or insights into factors for the high use of hospitals emerged. Data from the two streams were analyzed concurrently to identify and compare findings, and to refine future interviews to address information gaps. Coded data were grouped into categories, with continual cross-stream comparisons of findings and categories carried out, and categories arranged into themes. These themes were validated across the two streams in the final interviews.

Qualitative Research Findings

Three themes were identified across the two research streams: (a) serious illnesses and high care needs, (b) hospitals are an accessible and often sole place to get needed care, and (c) factors external to these people engender long hospital stays or readmissions. Before describing these themes, a description of the participants will be provided to provide a context to these themes. The mentally-ill patients interviewed had been diagnosed with major depression, schizophrenia, or bipolar disorder. They ranged in age from 20 to 52 years, with most under 40 years of age. Most had not only been admitted 1 additional time to hospital for mental illness care in the past 12 months but also 1 to 6 times for abdominal pain (i.e. gastrointestinal ulcers, gallbladder disease, or liver disease), chest pain (i.e. angina, pneumonia, or pleurisy), or to address the physical consequences of an attempted suicide, having been beaten or hurt in a car accident or fall. These patients were almost equally male or female, and 70% were single (divorced, separated, or never married) and almost all lived alone in a private home or apartment. None lived in a group home or a facility for people with chronic care needs.

The older patients, all of whom had long hospital stays, had a greater range of primary diagnoses: Geriatric failure to thrive, stroke, cancer, heart failure, respiratory failure, chronic obstructive pulmonary disease, ALS, dementia, acute or chronic kidney failure, or hip fracture due to fall. Most had multiple co-morbidities, however, and with chronic ill health for usually one year or more prior to the current hospitalization. Only one had been admitted to hospital in the past year, however. These persons ranged in age from 65 to 99 years. They were almost equally as likely to be male or female, and 80% were single (divorced, widowed, or never married). Half had been living in a group home (i.e. assisted living facility or lodge), and the remainder had lived in a private residence such as an apartment or house.

Theme One: Serious Illnesses and High Care Needs

The severity of illness among high users was first apparent when a large proportion of potential participants could not be interviewed because they were unconscious or semi-conscious with an advanced state of physical illness or incapacitated with an advanced state of mental illness. The data obtained from and about the interviewed mentally-ill patients revealed two specific categories; they were either experiencing: (a) a severely disabling episode of a previously undiagnosed mental illness, or (b) an exacerbation of a pre-existing mental illness. Similarly, but with one additional category, the interview and other data for the older long-stay patients revealed three categories: (a) seriously ill with a newly-diagnosed major and life-threatening illness, (b) seriously ill with an exacerbation of a chronic disease or illness state, and (c) terminally ill or dying and receiving end-of-life care.

Readmitted patients. The readmitted patients had experienced a severe episode of mental illness which, when diagnosed as such in a hospital emergency department, resulted in their being admitted for a second time that year to hospital. In most cases, the mental illness that they suffered from had been diagnosed previously. A small proportion experienced a severely disabling episode of a mental illness diagnosed only recently. The severity of these illnesses and the need for inpatient care were repeatedly illustrated. Some reported they had been awake for days before admission, unable to sleep or rest. Some had been “hyperactive” and some “really depressed, unable to do anything,” but all were fatigued when admitted. Most had not eaten or eaten “poorly” for days; as they were largely incapable of shopping, cooking or preparing meals, or even thinking about preparing and eating meals. Some said they were “severely depressed” and “did not feel like eating,” while others indicated that they were suspicious of food prepared by others, did not realize that they had not eaten, or had been eating an inadequate assortment of food.

Most indicated that they had become unable to care for themselves. The patients who lived alone were at considerable risk of neglect or harm, as illustrated by one patient who said: “too much of being by myself, loneliness,” a state which she thought had aggravated her mental illness. A physician said that she and other mentally-ill patients “don’t tend to identify or verbalize that they are lonely and this is a need that needs to be addressed.” Another patient who lived alone was hesitant to ask anyone for help because she “had always been independent.” A nurse concluded instead that “the health care system is difficult to navigate for high functioning people. It’s almost impossible for this population.”

Other mentally-ill patients who lived with supportive family members were also at risk when they began to feel ill, as demonstrated by this patient’s comment: “I live with my parents but they can’t do much.” His parents were older and not well. Another patient said that his spouse was “somewhat supportive, but it’s more out of habit.” He said his wife was frustrated by his forgetfulness and despite acknowledging he had an illness, she did not fully appreciate what he experienced. This patient said: “She thinks ‘I know you’re sick, but why isn’t the cleaning done?’ She thinks that since I’m home I should be able to get the cleaning done (while she is at work).” Another patient who said she had a supportive family but was reluctant to seek help from them because of her long-term illness: “I was sick and tired of feeling like I was in a black hole. I couldn’t get out of bed at home. I have lots of support but I didn’t want to be a burden on my family.”

Some mentally-ill patients lived with or relied on unsupportive family members or friends. One patient lived with, by her account, a “very unsupportive” spouse. She said, “I am

isolated at home by my husband. We don't get along. My husband is possessive. I had to implore him to bring me here." A social worker explained, "she is typical of patients without social support, they tend to be those who are hard to support, which exacerbates their isolation and loneliness issues. The acutely-ill also don't tend to have self insight." A nurse said of this patient's loneliness and isolation, "due to the nature of their illness, patients tend to isolate themselves or destroy relationships, and become more and more isolated as they are shunned by their family." She also said: "In hospital, the patients get well, functioning, going to group, get their hair and nails done, they are feeling and looking good, and they get discharged because they appear well. But at home they find that for whatever reason, people aren't drawn to them, or it's difficult to maintain social support, friendships, etcetera, which sets them up for depression, difficulties again."

Long-stay patients. The older long-stay patients had all been severely ill when admitted to hospital. Many long-stay older patients could not be interviewed as they were semi-conscious or unconscious, and some were near death receiving end-of-life care. One who could talk said "I will not leave here" and his interviewed family member also thought he would die in this hospital. Another patient acknowledged that her life was "drawing to a close, I have lived a long life but I have not been well now for 2 or 3 years." She was not expected to live when admitted to hospital, but had improved and arrangements were made for a nursing home. She died in hospital while waiting placement after a stay of 88 days.

All interviewed older long-stay patients had either a new major life-threatening illness or an acute exacerbation of a chronic illness. One, for instance, said "I have lung disease, and it is getting worse and worse on oxygen. This has been the worst yet, I can't seem to get better." Another recounted that she had been sick for "what seems forever, I wonder if I will ever get well again." More than half were expecting to go to a nursing home or rehabilitative/sub-acute care facility. One said "I know I will be going to sub-acute, but I still cannot walk and they won't take me until I get that back." Five knew they could not return to the lodge or assisted living complex where they had lived previously, as their care needs were higher now than the level of care that was provided in these places.

Theme 2. Hospitals are an Accessible and Often Sole Place to Get Needed Care

Two categories that were common across older long-stay and younger readmitted patients emphasize hospitals are an accessible and often the only place to receive necessary health care: (a) few community-based care options were available to promote or stabilize their health and prevent exacerbations or worsening of an episode of ill health, and (b) emergency departments alone are open 24 hours a day and capable of addressing severe illnesses.

The records and accounts of interviewed patients showed they were all admitted through the emergency department in a state of advanced illness. Mentally-ill patients often reported that they were in a "crisis," and many said that they think of the hospital as the "only" option. One patient waited to seek help through a hospital as "everyone goes there when sick." It took her a long time to seek help "because of the stigma (of mental illness)" and she was so ill when she arrived in the emergency department she was immediately admitted to hospital. Another patient said that "coming to hospital in crisis was the only way to get treatment." She experienced anxiety attacks frequently and said it had become increasingly difficult for her to cope with them. She reported "they would not take me in (to

hospital) until I said I was suicidal.” She and her husband had spent a considerable amount of their own funds to get help outside of hospital, but they waited months to see a psychiatrist or psychologist in the community.

Many patients did not know of any publicly-funded or free resources/supports available to them in their community, other than their family doctor. One patient, who lived in a rural area, did not seek mental health services in her home community because she did not think any existed. Similarly, an urban patient said he was not aware of any mental health drop-in or treatment centres that could help him when needed. He was also unsure if he would quality for any programs if they existed, adding that he sees “the hospital as the only option.” One nurse reported that mentally-ill patients are often unaware of the few existing resources in the community, as demonstrated by her comment, “The thing is, clients have to know about it too. They may be out there, but the people don’t know about it.”

The mentally-ill patients who were familiar with services or programs in the community often reported these as “few and far between” and “ineffective.” None appeared to be well-suited to their needs. One patient tried participating in an established program but the rules were “too strict” for him as clients were expected to attend this program a minimum number of days each week, otherwise they were not permitted to participate. This patient had also tried a drop-in centre, which was a more informal program, but it also had “too much structure.” Another patient tried to use a distress line, but was turned away. She commented, “Well, I think having the distress line is not a very useful thing. Because once when I (while experiencing suicidal thoughts) called, they told me that I was only allowed to call once.” Another patient and her husband reported what they saw as a lack of concern by community-based healthcare professionals, which caused them a great deal of frustration as they would not validate that she was having problems. A psychologist whom they hired privately “said nonchalantly, ‘you’re not going to die from anxiety’.” This patient was also told she was “faking” her symptoms to get attention. Both she and her husband felt she had a better chance of getting appropriate treatment in hospital.

Similarly, the long-stay older patients reported lack of access to community-based health care and support, with hospital emergency departments “thankfully open 24 hours a day, and they have tests and things for the really sick.” When questioned further, some were knowledgeable about specific community programs that they could attend, but these patients indicated that they lacked the funds or the health required to travel to the “one place in this big city where my program is.” Some reported doing home-based health maintenance activities, such as exercising on a stationary bike and watching what they ate to avoid salt or other products that they knew were harmful to their health. They did this to promote their health and prevent exacerbations of their chronic illness. Others reported attempting to get prompt medical attention for an illness before it worsened and became a health crisis. Some were successful in getting rapid attention, as one said “I can usually get into my doctor’s office the same day I call as he knows I am sick, and I only call when I really need his help.” Others were not, and hospital emergency departments alone are open 24 hours a day and designed to address severe illness states. As one patient recounted “well, where else do you go when you are really sick?”

Theme Three: Factors External to These People Engender Long Hospital Stays or Readmissions

Many factors external to the older and younger participants contributed to long

hospital stays and readmissions. Although varied, they were similar across the two research streams and could be classified as: (a) in-hospital factors or (b) post-hospital factors.

In-hospital factors. In-hospital factors for high use were numerous. One common factor was that many patients had not been admitted to the hospital unit that was appropriate for their care needs; they had been admitted to any available bed in the hospital. This first-bed policy meant they were moved later on, and some reported being moved two or three times. One long-stay patient said that her move was “terrible” as she had “liked the staff on the other unit better.” Many patients waited in hospital for specialist medical attention, and waits were particularly long when a series of medical specialists were needed. One long-stay patient reported “I waited about a week for the specialist to tell me about my kidneys, and he couldn’t tell me about my heart or my lungs.” Many patients also reported having to wait for other care providers; such as physiotherapists, nurse practitioners, pain specialist nurses, enterostomal therapist nurses, diabetic teaching nurses, and social workers.

Patients also waited for diagnostic tests and treatments. One reported that she waited a week before she had her hip fracture surgery; another reported waiting four days for an MRI test as “they are not done on weekends, and when Monday came, I was ready but got bumped into Tuesday as someone else needed it more than me, or so I was told.” A mentally-ill patient reported waiting for a CAT scan, and then when the results of that came back, he waited for a different test, and when the results of that came back, he waited for a third test. This patient said “why couldn’t I have it all done on the same day? They would have known what was wrong with me right away.”

Unmet needs were also identified as a factor extending hospital stays or contributing to readmissions. Being lonely and needing assistance with suicidal and other negative thoughts were commonly reported by the mentally-ill persons. In each case, they did not feel and the charts did not reflect that these needs were recognized, particularly when they were admitted to a unit that was not designed and staffed for mentally-ill persons. Unmet needs for care by long-stay patients though nursing staff shortages were also apparent. One long-stay patient said “I have been waiting all morning in a wet bed, and the nurse said she would be right back. That was two hours ago.” Another reported that she had been told by her doctor to walk more each day, but she said “how can I do that when the nurses are so busy they cannot even help you get out of bed to go to the lou (washroom).” She needed someone to be with her every time she walked, as she was at risk of falling.

Post-hospital factors. Post-hospital factors also impacted these mentally-ill and long-stay patients. The long-stay patients could not return to their lodge or assisted-care facility as they had higher care needs now, and no additional supports such as publicly-funded home care were offered so they could return to these familiar places. A similar problem existed for older persons who had been admitted from a private residence. One said, “I was getting home care once a week at home. I need home care every day now, and I don’t think they will give it to me.” Waiting for a nursing home, sub-acute, or rehabilitation bed was common among long-stay patients.

Waiting for appropriate housing such as a supportive living placement was also common for mentally-ill patients. One nurse said of patients admitted to her mental health unit, “Our clientele don’t really fit in anywhere. They fit between the cracks.” A physician also indicated that safe, affordable housing is especially problematic for people with mental

illnesses, “mentally-ill people face discrimination” when seeking placement in a private group home, as private facilities can “choose who they want....they do not choose people who might be difficult.” Another nurse said that the criteria for supportive living is strict, with some care facilities not permitting patients who use drugs or have a history of violence, which excludes many people with mental illnesses. This nurse also said that they are often discharged from these facilities for rule infractions. This could mean they then lived on the street or in other places that were not suitable for their needs. This nurse was concerned that people with mental illness are highly vulnerable to being taken advantage of, especially if they live on the street, saying “mentally-ill people are often readmitted to hospital as the community is not safe for them.” For some patients, an unsupportive home environment made the hospital an appealing place; one patient said, “At the hospital I feel safe and it is my home.” Another patient said the hospital is safer because “you’re more at risk at home.”

Post-hospital financial difficulties were also a problem. All mentally-ill participants interviewed were currently unable to work. When not in hospital, they relied on charity, disability allowances, or social assistance funds that one said would “barely pay the way.” One patient spent all but \$12 of her monthly social assistance cheque to rent an apartment for herself and her children. She was separated from an unsupportive husband and had little financial or other support from her family. This patient felt that she could not afford to take time to seek help when ill, and so she was at great risk of her illness worsening to the point where she would need to be hospitalized. Another patient who had not been able to work reported significant financial stress as his wife was very ill with cancer and could not work.

In summary, this ethnographic study of high users revealed many influences for the high use of hospitals that were similar between older long-stay inpatients and younger readmitted mentally-ill patients. These influences were grouped into three themes. Clearly, these patients were severely ill with high care needs. Hospitals were an accessible and in many cases the only place where they could get needed care. Many in-hospital and also post-hospital factors contributed to long hospital stays and hospital readmissions.

4. Quantitative Research Study – Psychiatric Hospital Use

In late 2009, a large dataset comprised of all data routinely collected over the two most recent years on every inpatient admitted to hospitals across Alberta were provided upon request to the principal researcher for analysis. Additional socio-demographic registry data were provided in early 2010 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, 2006 through March 31, 2008. All data provided were individual-anonymous, with a consistent personal identification number to enable an analysis of data for each individual within and across the two years. Two years of data were requested as a quality measure, so that the findings from the first year (April 1, 2006 – March 31, 2007) could be compared to the findings from the second year (April 1, 2007 – March 31, 2008). Although some patient and utilization differences are expected from year to year, the findings from one year should not be entirely dissimilar to the other year. Through analyzing and comparing two years of data, data issues or analysis errors could be detected and addressed. The only consistent issue was that 5.3% of all patients admitted did not have an age recorded. Regardless, administrative hospital databases are reliable and valid sources of information, as these databases are population based, and data are both carefully and routinely collected.

Quantitative Psychiatric Hospital Research Methods

The dataset received included all data routinely collected on every person admitted to an inpatient hospital bed for one or more days of care in Alberta. The variables were in keeping with the Discharge Abstracts Database (DAD) data routinely collected from all acute care, cancer, rehabilitation, auxiliary, and psychiatric hospitals across the province. These data variables are similar to those in other DAD databases across Canada (Canadian Institute for Health Information, 2009). The additional registry data provided consistent socio-demographic information on every patient. Although no information that could identify any patient 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 preparation by a research assistant.

Following this, the SPSS computer program was used to describe and compare patients, with the following information confined to all persons admitted to and discharged from one large (410 bed) psychiatric hospital. This hospital is of particular interest as there are only two stand-alone active treatment psychiatric hospitals in the province and the provincial health authority is planning to close some beds at this particular hospital.

Psychiatric Hospital Utilization Findings

From April 1, 2006 through March 31, 2008, there were 2,271 discharges from this 410-bed hospital, with 13 occurring through death. Over the first year, there were 1,094 discharges, with 14.1% of these hospital episodes initiated prior to April 1, 2006, the beginning of this fiscal year of study. In the second year, there were 1,174 discharges, with 24.0% of these hospital episodes initiated prior to April 1, 2007, the beginning of the second fiscal year of study. The following information (summarized in Table 4) is primarily oriented to describing these 2,271 hospital episodes. However, some people were admitted and discharged more than once to this hospital, 304 individuals (20.1% of all 1,511 individuals admitted/ discharged from this hospital) were discharged 2 to 5 times each in the two years. Only 27 of the 304 individuals (8.9%) were older people, and they were all discharged twice. The younger readmitted people were discharged 2 to 5 times each over the two study years.

As also shown in Table 4, for all 2,271 hospital episodes, the patients involved were more often male, residents of a large nearby city, and younger than 65 years of age. The patient's ages varied considerably, although the average age over the two years combined was 43.7, with similar median and mode ages. These findings show a large share of psychiatric hospital services are provided to people who are younger than the baby-boomers, the large population cohort born in the years 1946-1966, who are currently aged 44 to 64.

Almost all (94.9%) hospitalization episodes in these two years were for a mental illness or behavioral disorder (with the ICD codes of F00-F99), with another 5.0% because of a disease of the nervous system or sense organs (ICD codes G00-H99). Among all specific illnesses diagnosed as the primary reason for these hospitalizations, the most common was schizophrenia (34.6%), followed by mood (affective) disorders such as bipolar disorder (29.9%), organic brain disorders (5.8%) and neurotic conditions (5.3%). Most admitted patients had more than one diagnosis, with 13 the highest number and 3.5 the average number. Most hospital episodes (87.8%) did not involve any major diagnostic or therapeutic procedures. Individual psychotherapy or group therapy is not listed as a "procedure."

Most (82.6%) of these patients were admitted to this psychiatric hospital through a transfer from an acute care hospital, and mainly acute care hospitals situated in a nearby city. However, many smaller hospitals around the province (although primarily the northern half of the province) were also listed as having transferred between 1 and 43 patients each to this psychiatric hospital over the two study years. Another 8.6% of the patients discharged from this hospital were transferred from nursing homes and auxiliary or long-term-care (LTC) hospitals, with these care facilities also situated around the province. Another 7.4% of admissions involved transfers from rehabilitation and sub-acute care facilities around the province, and the remaining 1.3% of admissions involved transfers from another psychiatric hospital. A total of 87 care facilities in the province transferred patients to this hospital over the two years for acute psychiatric care.

Although the average length of stay for these 2,271 hospital episodes was just over 5 months, one half of all lasted 52 days or less, with 15 days the most common stay. As 79.5% of all admissions to this hospital followed a transfer from an acute care hospital bed (3.1% were transferred from an acute care hospital ER), most stays included care days at an acute care hospital first and then care days at this psychiatric hospital. Younger people and males typically had longer hospital stays. Younger people had a longer average stay than older people (895.6 vs. 311.2 days), as well as a longer median stay (501 vs. 216 days). Males had a longer average stay than females (557.3 vs. 477.0 days respectively), as well as a longer median (246.5 vs. 246 days) and mode stay (142 vs. 97 days). Nearly 20% of all hospital episodes were longer than the 153.9 day average, but half of all long hospitalizations included waiting for placement. Of all 2,271 discharges over the two years, 224 (9.9%) or 94 the first year and 130 the second year were designated as requiring ongoing nursing home level care, although around half already had this designation as they were transferred to the psychiatric hospital from a nursing home or LTC hospital. The number of days spent in this psychiatric hospital waiting for placement ranged from 1 to 986 per person, with an average wait of 141.5 days, although half of all waits were 68 days or less.

Of all discharges from this psychiatric hospital over the two years, 6.9% were to a nursing home or LTC facility. Nearly half of all patients who had a total hospital stay of one year or more were discharged to a nursing home or LTC hospital, while slightly more than half of the people who had stays of one year or more were discharged home. The vast majority (91.1%) of discharges from this psychiatric hospital were to the patient's home.

Psychiatric Hospital Utilization Discussion

This analysis of psychiatric hospital utilization data revealed younger persons are the most common patient admitted for acute mental illness care. For every 1 older person who received inpatient care at this specialized psychiatric hospital, 4.7 younger persons were admitted. This utilization pattern resembles the population distribution of Alberta - a province that is primarily (89%) comprised of younger people. This analysis of psychiatric hospital data also showed younger people with mental illnesses were more often admitted multiple times while older people with mental illnesses tended to have longer stays although these longer stays were often associated with waiting for a nursing home or LTC facility bed. Furthermore, the longest stay in this psychiatric hospital was by a younger person and repeated admissions by younger persons would accumulate care days that would outnumber those accumulated over one stay by an older person. The findings of this study thus

emphasize that some people could be classified as high users of psychiatric hospitals, through repeat admissions or many days of care, and that these persons are more typically younger.

Table 4. Psychiatric Hospital Inpatients – Summary of Findings

	First Year	Second Year	Two Years Combined
Age – all admissions			
- Mean/average years	43.9	43.5	43.7
- Median years	42	41	41
- Mode years	40	42	42
- Range in ages	14-100	13-98	13-100
Gender – all admissions (%)			
- Female	38.3	36.8	37.5
- Male	61.7	63.2	62.5
Residence – all admissions (%)			
- Urban	89.0	88.8	88.9
- Rural	11.0	11.2	11.1
Residence – all admissions (%)			
- Nearby large city	79.4	81.1	80.3
- Rural	11.0	11.2	11.1
- Other Alberta cities/urban areas	9.6	7.7	8.6
Primary diagnosis – all admissions (%)			
- Mental and behavioral disorders	94.7	95.2	94.9
- Nervous system and sense organ diseases	5.2	4.8	5.0
Length of stay – all admissions			
- Mean days	178.7	130.8	153.9
- Median days	57	49	52
- Mode days	15	13	15
- Range of days	1-12,092	1-4,461	1-12,092
Length of waiting for placement in a nursing home or LTC facility – all admissions			
- Mean days	183.8	110.9	141.5
- Median days	81	65	68
- Mode days	11	28	28
- Range of days	1-918	2-986	1-986
Diagnoses – all admissions			
- Mean/average number	3.28	3.76	3.53
- Median	3	3	3
- Mode	3	3	3
- Range	1-13	1-11	1-13
Procedures – all admissions			
- Mean/average number	0.21	0.21	0.16
- Median	0	0	0
- Mode	0	0	0
- Range	0-8	0-4	0-8
Received from – all admissions (%)			
- Acute care hospital	79.8	85.3	82.6
- Nursing home or LTC hospital	10.1	7.2	8.6
- Sub-acute or rehabilitation facility	7.9	6.9	7.4
Discharged to – all admissions (%)			
- Home	91.2	90.9	91.1
- Nursing home, rehab/LTC hospital	7.0	6.9	6.9

5. Case Study Discussion

As indicated previously, this case study was undertaken to gain a comprehensive, current, and focused understanding of high users of hospitals, a unique sub-population group that should be of much interest for many humanitarian and other reasons. This case study was ultimately undertaken, however, to provide evidence for health policy and services planning. All data gathering activities revealed useful and complementary information.

Although past utilization reports have often concluded that older people are high users of hospitals, this conclusion is not clearly supported by the systematic literature review and it is also directly contradicted by the findings from the utilization study of two acute care hospitals in Alberta. At these two hospitals, younger people were more often the highest users of ERs, daysurgery units, outpatient clinics, and inpatient beds through both readmissions to hospital and total share of bed days. Mental illness was the most common diagnosis among the younger high users at these two acute care hospitals. These findings are remarkable as mental illness affecting younger persons has not been recognized as a risk factor for the high use of hospitals. Nor has mental illness care been considered as a factor for the long waits for hospital-based diagnostic tests and treatments of physical ailments (such as surgery) – the most recognized and addressed health system problem in Alberta and elsewhere across Canada since at least 2003 (Health Canada, 2006). Regardless of all the many possible reasons for long wait lists or wait times, hospital downsizing in Canada during the 1990s and relatively stagnant bed numbers since despite population growth is necessitating ever more careful use of acute care hospital beds (CIHI, 2001).

It should be of much interest then that younger people with mental illnesses were found to be the most typical high users of both acute care hospital beds and ambulatory hospital services. The investigation of one psychiatric hospital's discharge abstracts data also revealed that the majority of hospitalizations in two recent years involved younger people. In addition, most readmitted psychiatric patients were younger, and younger readmitted people were usually readmitted more times than older readmitted people. Clearly, these psychiatric hospital beds were used more often by younger persons, and mental illness was also found to be a significant factor for the use of acute care hospital services. This use of hospital resources for acute mental illness care has not been widely recognized, although the CIHI (2008b) report on mental illness care in Canada outlined that a considerable proportion of acute psychiatric care is now provided in general hospitals.

This use of general acute care hospitals for mental illness care may be an established or long-term pattern, although some increase in their use is likely a result of various factors, including the 1990+ trend across North America to downsize or close mental hospitals. This reduction in bed numbers in facilities specialized for psychiatric illness care followed important drug and community-care advancements, although cost-cutting was another recognized reason (Flannery et al., 1997). Community-based care is more available now, in part because of this downsizing of psychiatric beds and because of drug and therapy developments. The findings from the two-hospital study, the qualitative study, and the psychiatric hospital study suggest however that community-based options may not be as advanced, effective, or accessible as needed by acutely or severely mentally-ill persons. Community-based care options are important as they present the possibility for shorter hospital stays, the prevention of readmissions to hospital beds and ambulatory care areas, and also perhaps the prevention of need for acute hospital-based psychiatric care. The qualitative

study was particularly revealing about the state of community-based care; acute care hospitals appear to be an accessible, known, and reliable source of acute psychiatric care.

It is of considerable interest then that provincial decision-makers announced in mid-2009 that the psychiatric hospital studied would be downsized the following year. The initial stated plan was to close 246 of 410 beds (60%), with some unspecified corresponding expansion of community-care options to meet the care needs of current and future displaced mentally-ill patients (CBCNews, August 14, 2009). This change would have resulted in a major reduction in regional mental health beds; as in the nearby city of nearly one million persons, there are 2,021 acute care hospital beds in 5 acute care hospitals, with 154 (7.6%) of these beds designated for mental illness care. The closure of 246 mental health beds in the psychiatric hospital (which is situated to the immediate north of this city) would represent a 43.6% reduction in regional mental illness care beds, and a 10.1% reduction in all existing hospital beds in this same region. Many individuals and groups raised alarm about the impact of closing the 246 psychiatric hospital beds; with an increase in homelessness expected, as well as increased family caregiver burden, crime, and overburdened community-based mental health services. In mid January 2010, it was announcing instead that only 100 of the 410 psychiatric hospital beds would close, and that the residents who would be displaced were those waiting placement in a nursing home. Although waiting placement is a common reason for long stays in this psychiatric hospital, the future implications of permanently closing these beds is of interest.

This case study indicates that closing psychiatric hospital beds, beds that are used by persons who are at considerable risk of being high users of inpatient and ambulatory hospital care services, would likely have an impact on general public access to all acute care hospital services; including inpatient beds, ERs, outpatient clinics, and daysurgery clinics. This impact could be calculated using the median psychiatric hospital stay of 52 days and the average stay of 153.9 days, which indicates that the closure of these 100 beds could result in 300-700 less admissions each year to this hospital for specialized psychiatric care. As all persons admitted to this psychiatric hospital were transferred from acute care hospitals or continuing care facilities around the province, a backlog of patients needing acute psychiatric care would occur at these facilities. This impact could be greater, however, as mentally-ill younger persons are at higher risk of being readmitted for acute psychiatric care, and they tend to have longer stays in hospital. Rural and urban citizens both would be affected by the proposed psychiatric hospital bed closures, as admissions to this hospital are from most regions of the province.

Additional impacts of closing psychiatric hospital beds could also include the issue, as identified by the qualitative study, that mentally-ill persons admitted to an acute care hospital would be admitted to the first available hospital bed. This placement could delay their receipt of appropriate care and thus delay their recovery and discharge from hospital. In short, closing 100 psychiatric hospital beds is likely to put pressure on the 154 mental health beds in the nearby city, as well as the other 1,867 acute care hospital beds. Other issues could occur with the backlog of patients needing acute psychiatric care in acute care hospital and nursing home beds around the province, such as patient and staff safety issues. Still other issues could occur if community-based care options are not expanded, as more persons would need a higher level of community-based care with the acute psychiatric hospital bed closures.

All four data gathering activities also revealed another type of high user – persons with long stays or many accumulated care days in hospital. In this case, older persons (and

females) were the more typical high user. The systematic review, two-hospital study, and psychiatric hospital study all found older high users often waited in hospital for a nursing home or another type of LTC facility bed, with hospital waits also needed at times for rehabilitation or sub-acute care beds. DeCoster et al. (1997) and others have indicated that hospital-based care of older people is often rehabilitative and/or nursing-oriented in nature. Obviously, many care days in the studied psychiatric hospital and the two acute care hospitals were used by persons who no longer needed acute care, but instead needed daily nursing or supportive care in homes, chronic psychiatric or seniors' care facilities, or other community-care settings. As shown by the qualitative study, a contributing issue to long waits is the exclusionary admission criteria of post-hospital care facilities, such that patients who had previously resided or received care at these facilities could be denied readmission. A more fluid system appears to be necessary to address the use of scarce acute care hospital beds for non-acute care purposes. Having funding follow the patient across care settings, instead of facility-based operational funding and then limited-range services at each facility in keeping with their funding level, may assist more rapid movement of long-stay non-acute patients out of hospital. Opening additional nursing home beds and rehabilitation beds, and/or hospice and assisted living beds, may be another option to help reduce long stays in hospital. It is also possible that these persons could be returned to their home, lodge, or assisted living complex if home care services were enhanced, and in the case of long-stay mentally-ill persons if the residency and other requirements of group homes were relaxed. However, although it is tempting to think that waiting placement is the main reason for long hospital stays, the qualitative study indicated that hospital stays were also extended by delays in diagnostic testing, and lack of timely access to the specialists needed to diagnose and treat illnesses. Unless measures are taken to address these issues, this problem of lack of timely and appropriate care in hospital would be exacerbated if long-stay patients were more quickly moved out and more acutely-ill short-stay patients admitted.

This conclusion may explain another recently announced (and rescinded) provincial decision; to close 160 acute care hospital beds in the city highlighted by the two quantitative studies and another 190 acute care hospital beds in another large city, with 350 urban beds in total to close over three years (CBCNews, September 16, 2009). Currently, there are 6,800 acute care hospital beds in the province for 3.5 million citizens (Alberta Health Services, 2009). Although this plan may have been oriented to closing hospital beds that are used by older chronic care or long-stay patients, bed closures do not guarantee that this type of patient will be moved out of hospital. The qualitative study demonstrated that older long-stay patients are extremely dependent on others for care, and often dying. Nursing home expansion may therefore be needed to permit some to be moved out of hospital, with this move out of hospital recommended for many reasons. One reason is that nursing home care has been shown to shorten hospital stays and reduce hospital admissions (O'Brien, Johnston, Gao & Dewar, 2007; Shapiro, Tate & Roos, 1987; Wilson & Truman, 2001, 2004, 2005). An announcement has been made that 50 million dollars would be used in 2009-2010 to "support the development and modernization of affordable supportive living and lodge units in communities across Alberta" (Government of Alberta, online). Similarly, the current continuing care strategy is oriented to "accelerate the growth and modernization of health and personal care services. The strategy is intended to provide new ways of delivering services, offering more choice to Albertans in their homes and communities (Alberta Health and Wellness, 2008, p. 2). Attention may also be specifically needed for hospice/palliative

care, as there are less than 10 free-standing hospices in the province, with no announcements that hospices will be built and operated by the province or private ones encouraged through regulation and/or other mechanisms. All such developments appear to be needed to move or more quickly move long-stay high users, dying persons, and chronically-ill patients out of hospital. These developments would be particularly needed if acute care beds were closed.

Case Study Conclusion

The findings of these four sequential data gathering activities add to the growing body of evidence that has consistently identified only a small proportion of the people who use hospitals each year are high users of hospitals. This case study not only highlights the types of people who are (or could be) high users, but it also helps to increase understandings of their need for and use of various types of hospital services. This case study has specifically highlighted younger mentally-ill people as the highest users of hospitals; with cross-Canada research by the Canadian Institute for Health Information (CIHI, 2008b) similarly pointing out this is a unique high-risk group comprised of people who require specialized and patient-specific considerations for addressing their health care and other needs. The long hospital stays and many accumulated beds days by a small number of older persons mainly also demonstrate a second unique at-risk group also comprised of individuals needing special consideration with regard to their health care and supportive care needs. Although closing beds in psychiatric hospitals and acute care hospitals may appear to be a simple and straightforward way to increase hospital efficiency and reduce health system costs, these closures could exacerbate hospital access issues and other concerns for urban and rural citizens.

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