



Care for Children and Youth With Mental Disorders

Report

May 2015

Types of Care



Canadian Institute
for Health Information

Institut canadien
d'information sur la santé



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Healthier Canadians.

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Please note that the analyses and conclusions in the present document do not necessarily reflect those of the individuals or organizations mentioned above.

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Executive Summary

Child and youth mental health is a significant concern in Canada and globally—according to the World Health Organization, mental disorders accounted for 13% of the global burden of disease. It is estimated that between 10% and 20% of Canadian children and youth may develop a mental disorder. If not identified, diagnosed and effectively treated, mental disorders with onset early in life can lead to substantial negative health and social outcomes, including early mortality.

While most mental health care services for children and youth are accessed in the community, hospital-based emergency and inpatient care can often be the first point of access for children and youth dealing with significant mental disorders. Emergency departments (EDs) can be used for emergency mental health care needs related to mental disorders, as well as other concerns related to emotional, behavioural or social challenges. Inpatient hospitalizations may be necessary depending on the nature and severity of the mental disorder, availability of community-based support and the safety of the child and his or her loved ones.

Treating mental disorders in youth involves a variety of interventions, including psychosocial therapy and medications. Pharmacotherapy alone is not recommended for youth and should ideally be preceded and/or complemented by psychosocial therapy. Concerns have been raised about the appropriate use of psychotropic medications and whether there is sufficient clinical monitoring of youth taking these medications.

Using mainly administrative data from the Canadian Institute for Health Information (CIHI), this study examines ED visits and hospitalizations for mental disorders among children and youth, and youth dispensed psychotropic medications. The study's main findings are as follows:

1. Rates of ED visits and inpatient hospitalizations for mental disorders among children and youth have increased 45% and 37%, respectively, between 2006–2007 and 2013–2014.
2. The greatest increases in rates of hospital service use are among youth 10 to 17 years old, those with mood and anxiety disorders and those living in urban areas.
3. Use of psychotropic medications is common—1 in 12 youth were dispensed a mood/anxiety or antipsychotic medication in 2013–2014—and has increased over time.
4. For youth dispensed psychotropic medications, the increase in use is confined to those living in urban or suburban areas and dispensed the most commonly prescribed medications, selective serotonin reuptake inhibitors (SSRIs) and the antipsychotic medication quetiapine.
5. Quetiapine is dispensed to youth almost exclusively at dosages below the Food and Drug Administration's recommended range for treating schizophrenia and bipolar disorders.

This report's findings can be used to assist in planning for services and to gauge the success of interventions targeted to children and youth with mental disorders.

Introduction

Overview

Mental disorders are characterized by alterations in thinking, mood or behaviour and are associated with significant distress and impaired functioning.¹ Mood disorders, including depression and bipolar disorder, anxiety disorders and schizophrenia, are among the most serious psychiatric disorders affecting adolescents and young adults. Other disorders common among youth include substance-related disorders and emotional and behavioural disorders such as attention deficit hyperactivity disorder (ADHD) and eating disorders.

An estimated 20% of Canadians will experience a mental disorder during their lifetime, and for most, the onset will occur during childhood, adolescence and young adulthood.²⁻⁵ The occurrence of mental disorders among children and youth is associated with poor educational and employment outcomes. According to the Canadian Survey on Disability (2012) more than half (52%) of the respondents age 15 to 24 indicated that they were at a disadvantage in their employment due to their mental health-related disability. Most of these individuals (98%) were enrolled in either full-time or part-time education.ⁱ While this is encouraging, those with mental disorders reported relatively low levels of educational attainment—26% of respondents age 25 to 44 had not completed high school. Other research has shown that children and youth with mental disorders are at greater risk of involvement in the criminal justice system.⁶ There is considerable evidence to suggest that early intervention using the best evidence-based mental health care for youth with mental disorders yields considerable benefit.^{7, 8}

The Mental Health Status of Children and Youth

Most Canadian children and youth are mentally well: 3 out of 4 Canadians age 12 to 19 rate their mental health as very good or excellent.⁹ However, a small but significant share of Canadian children and youth may require some level of intervention:

- 8% of youth age 15 to 24 described their mental health as fair or poor;¹⁰ and
- 6% said that they had suicidal thoughts in the past year.¹⁰

In addition, provincial school surveys indicated that

- At least 15% of males and 22% of females in Ontario reported at least 1 mental health condition (including depression, anxiety disorder or panic attacks, and/or ADHD);¹¹ and
- 22% of school-age children in Ontario saw a physician about their emotional or mental health in the last year.¹²

i. Further details of this analysis are provided in Appendix A, and detailed results are available for free download as part of the companion data tables for this report.

Statistics Canada's National Longitudinal Survey of Children and Youth (NLSCY) provides information on the impact of early life experiences on mental health later in life. Longitudinal data was collected every 2 years between 1994 and 2008. According to this survey, factors associated with higher degrees of self-reported depression at age 18 to 22 include parental self-reported depression, low income at age 4 to 8 and emotional difficulties at age 10 to 14.ⁱⁱ

The Delivery of Mental Health Services

Most mental health services are accessed in community settings. Specialists, including psychiatrists, psychologists, social workers and counsellors provide care in community clinics, private practice, hospitals and schools. Family doctors, pediatricians and nurses working in community settings are also key providers of mental health care for youth. In some urban communities, outreach workers provide care to homeless youth in shelters or on the street. Increasingly, youth may be effectively reached through telephone and online counselling services.¹³ As well, residents of rural areas can have limited access to mental health professionals, although some may have access to telepsychiatry services. Emergency departments or inpatient services within general or psychiatric hospitals are also key settings when a mental health crisis occurs or there is need for intensive treatment.

Treatment of mental disorders typically involves psychosocial therapy and/or the administration of medication. Psychosocial approaches are essential first-line treatments for youth with mental disorders. It is generally recommended that these approaches precede and, if medications are recommended, complement pharmacotherapy. For youth diagnosed with certain mental disorders (e.g., bipolar disorder, severe major depressive disorder or schizophrenia), psychotropic medications complemented by psychosocial therapy may be a first-line intervention.¹⁴

The Organization of Mental Health Care

Within jurisdictions there are often multiple agencies responsible for supporting and overseeing mental health services for youth. Insufficient coordination between ministries involved in mental health services can result in inefficiency and difficulty on the part of patients and families in navigating the system of care.¹³ In addition, it complicates tracking of disease incidence and duration and identifying treatment patterns and the success of alternative approaches. These challenges in the organization of care are common across the provinces and territories.¹⁵⁻¹⁷

ii. Further details of this analysis are provided in Appendix A, and detailed results are available for free download as part of the companion data tables for this report.

Gaps in the Mental Health Care Delivery System

While there are many types of providers and settings in which mental health services are provided, there are well-recognized gaps in the care delivery system:

- Service availability
- Service integration
- Timely access
- Transition between child/youth and adult services

Several national and provincial organizations have highlighted the personal and societal toll associated with mental disorders.^{13, 17, 18} The estimated economic costs of mental disorders in Canada have been estimated at \$50 billion a year.¹⁹ In 2006, a standing Senate committee completed the first national study of mental health, mental illness and addictions.²⁰ A year later, following one of that report's key recommendations, the standing Senate committee created the Mental Health Commission of Canada to act as a catalyst, improve the mental health system and change the attitudes and behaviours of Canadians regarding mental health issues. While there has been much progress in the area of child and youth mental health in Canada, experts acknowledge there is still much to be done.^{13, 21}

About This Report

The goal of this study is to examine the current state and recent trends of health system utilization and psychotropic medication dispensing for children and youth with mental disorders.

This report focuses primarily on hospitalizations, ED visits and the dispensing of psychotropic medications because these represent important mental health care settings and treatments for which comprehensive data is available. The following questions are addressed:

- How frequently are Canadian children and youth using hospital services for mental disorders? Has utilization changed during the study period? What factors are associated with utilization of hospital services among these children and youth?
- How frequently are youth dispensed psychotropic medications? Has this changed over time? What factors are associated with prevalence rates and trends in youth dispensed psychotropic medications?

Information on the methodology can be found in Appendix B. A complete list of the mental disorders included in this report can be found in Appendix C. The medications discussed in this analysis are used to treat mood, anxiety and psychotic disorders. Detailed technical notes as well as a complete list of the medications included are available on the [website](#).

Main Findings

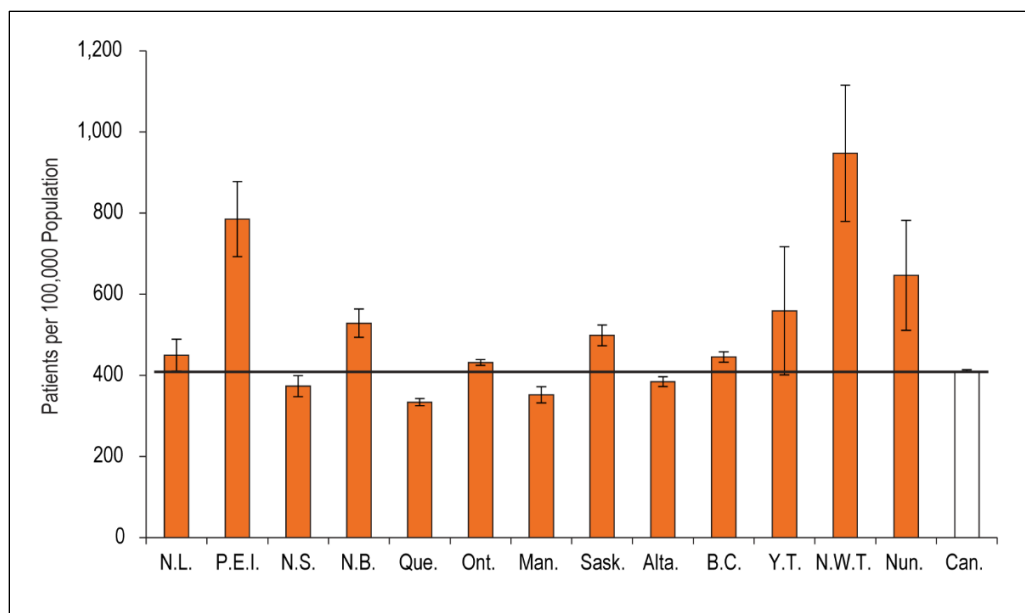
Hospital Service Utilization

Snapshot of Hospital Service Utilization, 2013–2014

In 2013–2014, 5% of ED visits and 18% of inpatient hospitalizations for children and youth age 5 to 24 in Canada were for a mental disorder. This translates into 1,371 per 100,000 Canadian children and youth visiting an ED and 409 per 100,000 Canadian children and youth having an inpatient stay for a mental disorder. Children and youth with mental disorders had a total of 609,034 patient days in hospital in 2013–2014, which is nearly half (46%) of all patient days for children and youth that year. The rate of inpatient hospitalizations varied by province/territory (Figure 1). This variation could be explained at least in part by differences in how mental health care is delivered, what services are available and what policies are in place to address the particular needs of the jurisdiction.

A more detailed analysis, including regional and jurisdictional variation over time, patient profiles and examples of provincial mental health initiatives is available for free download as part of the companion data tables for this report.

Figure 1: Variation in Rates of Hospitalization for Youth Age 5 to 24 by Jurisdiction, 2013–2014, Canada



Note

Diagnoses based on main problem (ED) and most responsible diagnosis (inpatient).

Sources

Discharge Abstract Database, Hospital Morbidity Database and Ontario Mental Health Reporting System, 2013–2014, Canadian Institute for Health Information.

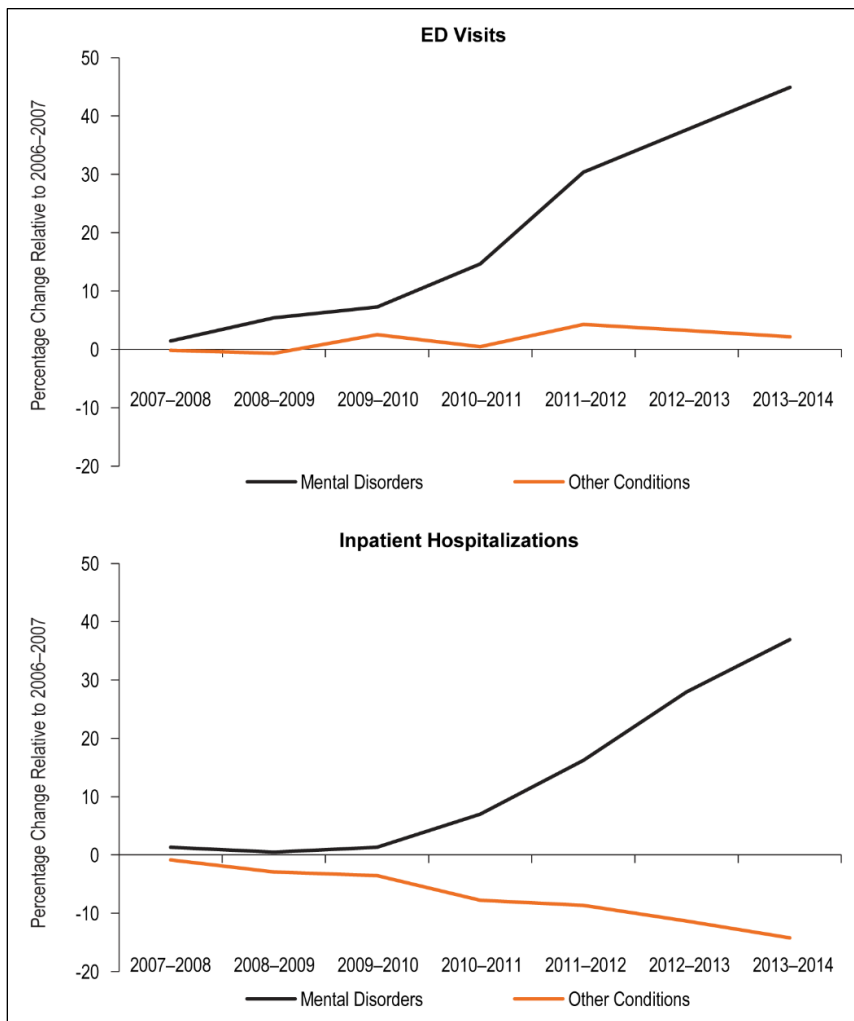
Population estimates: Statistics Canada, Demography Division.

Growth in the Use of Mental Health Services

Rapid Growth in Rates of ED Visits and Hospitalizations

Between 2006–2007 and 2013–2014, for 5- to 24-year-olds with a mental disorder, rates of ED visits increased by 45% and rates of inpatient hospitalizations increased by 37%. During this period, rates of ED visits for other conditions among this age group remained relatively stable and inpatient hospitalizations declined 14% (Figure 2).

Figure 2: Change in the Rate of ED Visits and Inpatient Hospitalizations for Mental Disorders per 100,000 Population, 2007–2008 to 2013–2014, Age 5 to 24, Canada



Notes

ED Visits include Alberta and Ontario only.

Diagnoses based on main problem (ED) and most responsible diagnosis (inpatient).

Sources

National Ambulatory Care Reporting System, Discharge Abstract Database and Hospital Morbidity Database, 2006–2007 to 2013–2014, Ontario Mental Health Reporting System, 2013–2014, and Hospital Mental Health Database, 2006–2007 to 2012–2013, Canadian Institute for Health Information; Alberta Ambulatory Care Database, 2006–2007 to 2009–2010, Alberta Health Services. Population estimates: Statistics Canada, Demography Division.

Children and youth using these hospital services for mental disorders were much more likely than those using hospital services for other reasons to have repeat ED visits and repeat hospitalizations:

- 39% of children and youth who visited the ED for a mental disorder had 3 or more ED visits, compared to 15% of patients who visited the ED for other reasons.
- 11% of children and youth with a mental disorder had 3 or more inpatient stays compared to 4% of children and youth with a stay for other reasons.

Previous CIHI work suggests that 3 or more repeat hospitalizations for mental disorders in 1 year may indicate challenges in obtaining appropriate care in the community, and signals gaps in care that can be addressed at the community level.²² Experts suggest that services delivered at home and in communities are the most effective when treating children and youth.²³ Building capacity among primary care providers such as family physicians to recognize and treat symptoms of emerging mental disorders is one way to support improved positive patient outcomes.^{21, 24} Bolstering services offered by community-based children's mental health agencies is another.

The potential to reduce hospital use by bolstering community-based services has significant implications for cost savings. According to analyses using CIHI's Case Mix methodology, the average costs for both ED visits and inpatient stays for mental disorders can be double those for other reasons.

Counselling and Psychotherapy Increased by 10% Since 2007

While comprehensive information on community-based mental health services is limited, available billing and survey and administrative data are informative. Data from the National Physician Database indicates that counselling and psychotherapy services delivered by physicians for those age 5 to 24 increased by 10% between 2007 and 2012 according to physician billing data. Whether this contributed to improved patient outcomes cannot be determined with the available data.

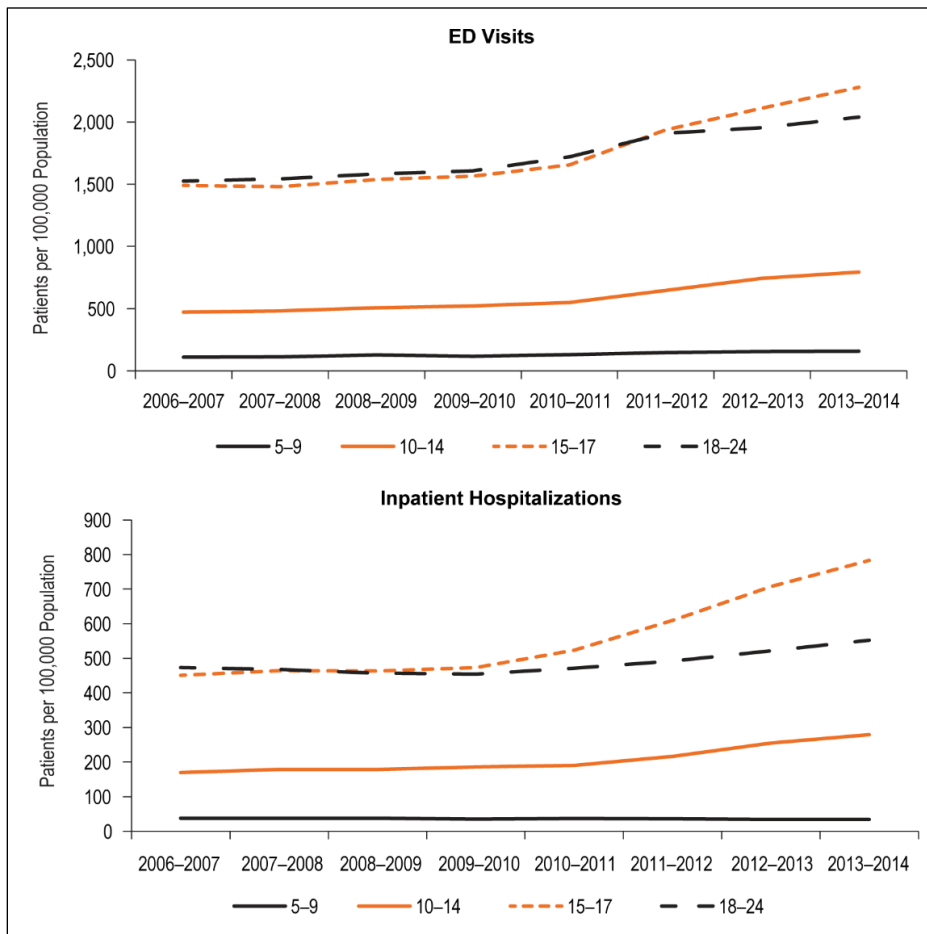
Community-based children's mental health agencies are reporting that demand for their services is increasing. A recent survey by Children's Mental Health Ontario found that agencies have been experiencing a 10% increase each year in the number of referrals they receive for long-term counselling and therapy.²⁵ Children seek treatment in the community-based sector for a variety of mental health challenges ranging from mild to moderate acute distress to severe and chronic mental illnesses. The community-based sector may also provide treatment to children and youth following discharge after a crisis hospitalization.

There is also evidence of an increase in the use of professional counselling by phone. For example, Kids Help Phone is a free service available across Canada that provides information, anonymous phone and online counselling and referral services for children and youth (www.kidshelpphone.ca). From 2010 to 2013, Kids Help Phone reported a 29% increase in counselling for youth with mental and emotional health concerns and a 22% increase in counselling for youth with thoughts of suicide.²⁶

Increases in Rates of ED and Inpatient Use Highest Among 10- to 17-Year-Olds

In 2013–2014, most ED visits and inpatient hospitalizations for mental disorders among youth were for those age 15 to 24. This age group also accounted for the biggest increase in volume of ED visits and inpatient hospitalizations. However, when considered as a rate per 100,000 population, the largest increases in hospital service use were among those age 10 to 14 and those age 15 to 17. The rate per 100,000 children and youth visiting the ED increased significantly, by 68% for those age 10 to 14 and by 53% for those age 15 to 17. The rate of inpatient hospitalizations for these 2 age groups also increased significantly, by 64% and 74% respectively (Figure 3).

Figure 3: Rate of ED Visits and Inpatient Hospitalizations for Mental Disorders by Age per 100,000 Population, 2006–2007 to 2013–2014, Canada



Notes

ED Visits include Ontario and Alberta only.

Diagnoses based on main problem (ED) and most responsible diagnosis (inpatient).

Sources

National Ambulatory Care Reporting System, Discharge Abstract Database and Hospital Morbidity Database, 2006–2007 to 2013–2014, Ontario Mental Health Reporting System, 2013–2014, and Hospital Mental Health Database, 2006–2007 to 2012–2013, Canadian Institute for Health Information; Alberta Ambulatory Care Database, 2006–2007 to 2009–2010, Alberta Health Services. Population estimates: Statistics Canada, Demography Division.

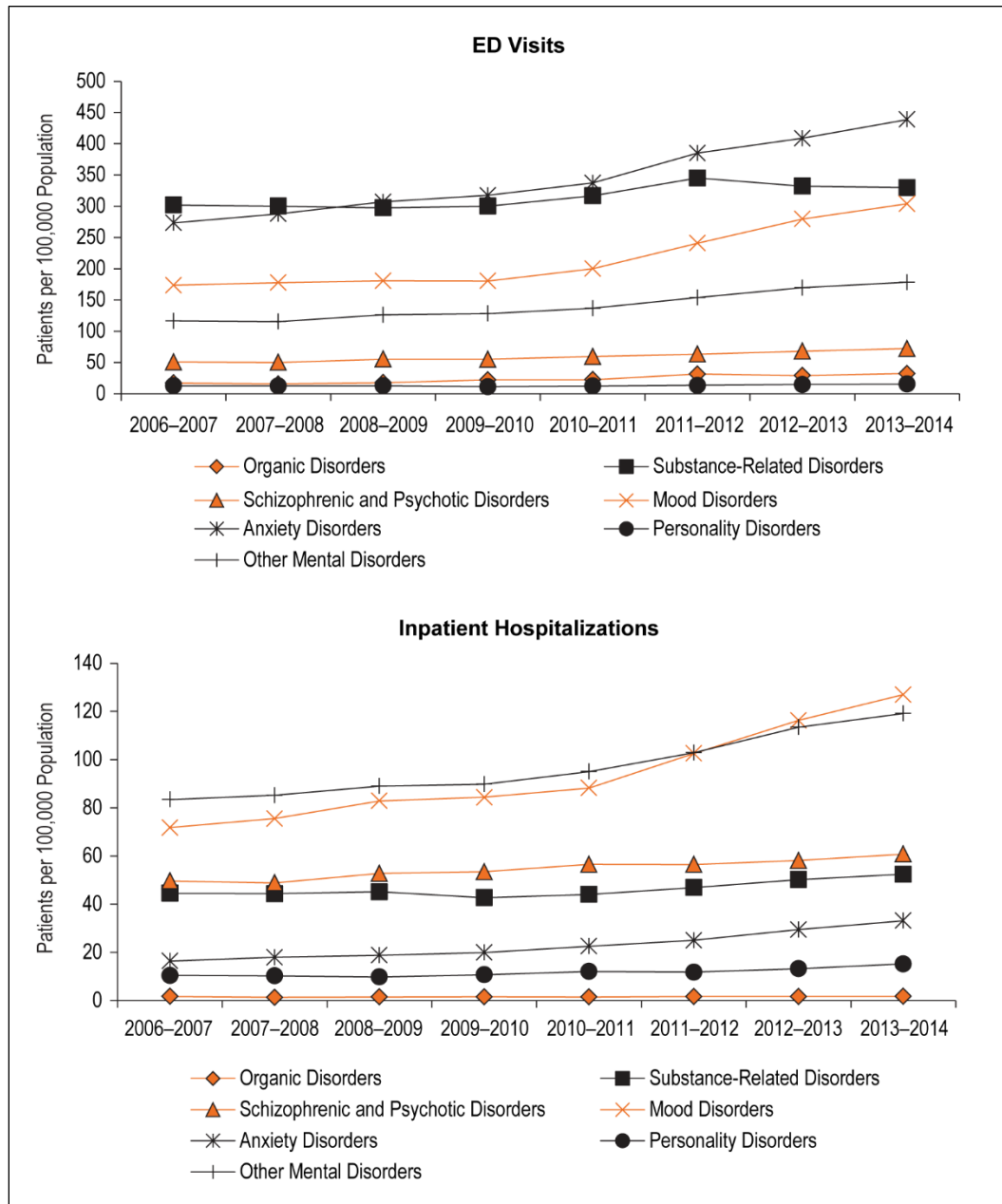
Youth age 15 to 24 make up the majority of ED visits and inpatient hospitalizations across all years. This is consistent with disorder prevalence rates in this age group. Youth age 15 to 24 are typically considered to be “in transition,” that is, they are aging out of the pediatric system of care and into adult-focused systems. Patients and families report such transitions are difficult to navigate because adult systems rarely accommodate the unique needs of youth. Therefore, the increase in hospital service utilization among 15- to 24-year-olds may indicate that there is a gap in the availability of community-based service geared toward this group. Thus, this age group has been identified as a priority group for service development.²⁷

Increases in Rates of ED and Inpatient Hospitalizations Greatest Among Those With Mood, Anxiety and “Other” Disorders

As shown in Figure 4, anxiety, mood and substance-related disorders were the leading causes of ED visits for mental disorders among children and youth in 2013–2014. Since 2006–2007, significant increases were seen only in the proportion of ED visits for mood and anxiety disorders, while visits for substance use disorders decreased. For inpatient hospitalizations, mood disorders and “other” mental disorders (e.g., conduct disorder and eating disorders) were among the most common diagnoses. Increases since 2006–2007 are evident in hospitalizations for mood, anxiety and “other” mental disorders.

The decrease in both ED visits and inpatient hospitalizations for substance use disorders is consistent with the results of school surveys in Ontario, British Columbia and Nova Scotia indicating a decrease in the use of alcohol and other substances over the last several years.

Figure 4: Rate of ED Visits and Inpatient Hospitalizations for Mental Disorders by Diagnosis per 100,000 Population, 2006–2007 to 2013–2014, Canada



Notes

ED Visits include Ontario and Alberta only.

Diagnoses based on main problem (ED) and most responsible diagnosis (inpatient).

“Other Mental Disorders” refers mainly to conduct, emotional and behavioural disorders.

Sources

National Ambulatory Care Reporting System, Discharge Abstract Database and Hospital Morbidity Database, 2006–2007 to 2013–2014, Ontario Mental Health Reporting System, 2013–2014, and Hospital Mental Health Database, 2006–2007 to 2012–2013, Canadian Institute for Health Information; Alberta Ambulatory Care Database, 2006–2007 to 2009–2010, Alberta Health Services. Population estimates: Statistics Canada, Demography Division.

These trends reflect the prevalence of these disorders among children and youth, with mood, anxiety and other disorders such as conduct disorder and ADHD being among the most common.^{28, 29} Schizophrenia, while relatively rare, is the third most common reason for hospitalizations among children and youth with mental disorders, likely reflecting the severity of the disorder. Also consistent with what is known about these disorders, females were more often hospitalized for a mood or anxiety disorder, and males for substance use and schizophrenic and psychotic disorders.^{1, 30}

Self-Harm in ED and Inpatient Care on the Rise: Girls Nearly 5 Times as Likely to Visit the ED for Intentional Self-Harm

A recent CIHI analysis looking at trends in the number of ED visits and inpatient hospitalizations for intentional self-harm revealed that in 2013–2014, the number of ED visits for intentional self-harm among 10- to 17-year-olds increased 45% between 2009–2010 and 2013–2014, and the number of hospitalizations for self-harm among this age group increased an alarming 85%. In addition, nearly 5 times as many girls as boys age 14 to 17 visited an ED for self-harm behaviours, and more than 4 times as many girls as boys age 14 to 17 were hospitalized for self-harm.

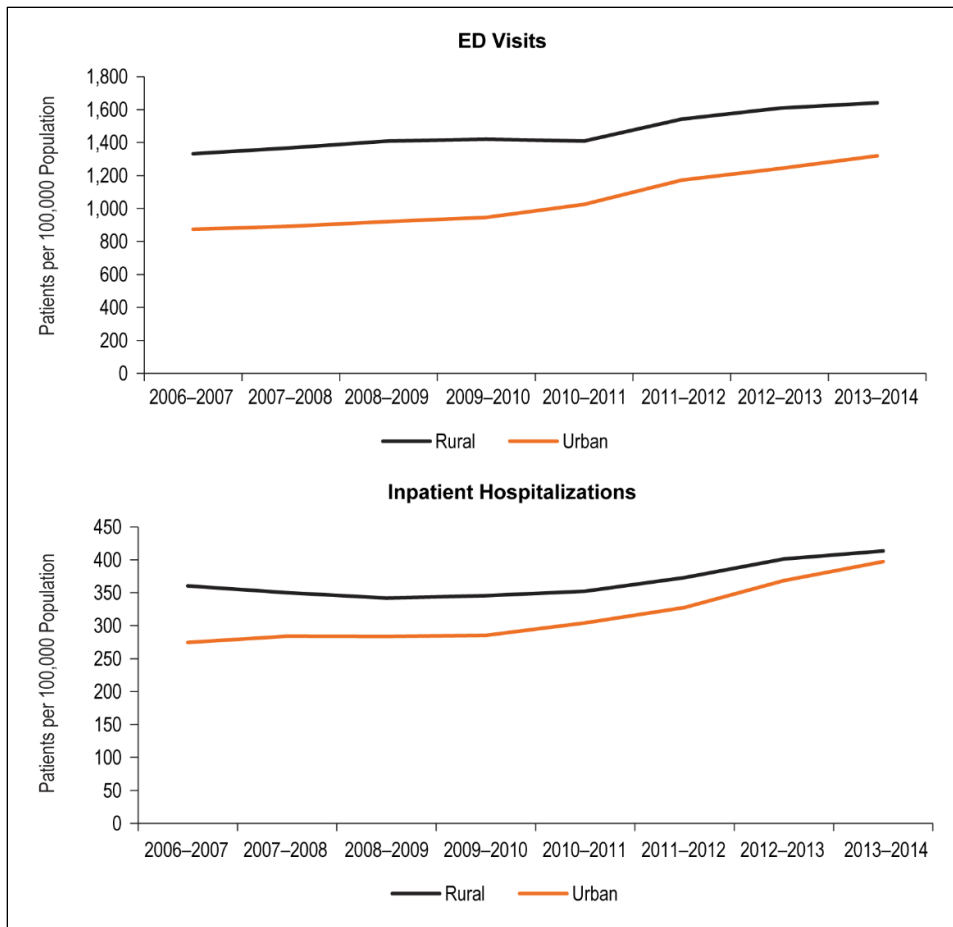
Children and youth who visited the ED or inpatient care for self-harm were not included in the diagnostic categories of mental disorders for the current report.

For more details, please visit <http://www.cihi.ca/>.

Rates of Hospital Use Higher Among Rural-Dwelling Youth, but Trend of Increased Use Predominates Among Urban-Dwelling Youth

Reliance on hospital settings for mental health services is greater among those living in rural as compared to urban areas (Figure 5). Rates of ED visits and inpatient hospitalizations for mental disorders among children and youth are increasing in both urban and rural areas, though the increase is much greater among urban-dwelling patients. Specifically, there was a 51% increase over the study period in the number of urban-dwelling children and youth who visited the ED for a mental disorder, versus a 23% increase among rural residents. Similarly, there was a 45% increase over the study period in the number of urban-dwelling children and youth with an inpatient hospitalization for a mental disorder versus a 15% increase among rural-dwelling children and youth.

Figure 5: Rate of ED Visits and Inpatient Hospitalizations for Mental Disorders by Rural/Urban Residence per 100,000 Population, 2006–2007 to 2013–2014, Canada



Notes

ED Visits include Ontario and Alberta only.

Diagnoses based on main problem (ED) and most responsible diagnosis (inpatient).

Sources

National Ambulatory Care Reporting System, Discharge Abstract Database and Hospital Morbidity Database, 2006–2007 to 2013–2014, Ontario Mental Health Reporting System, 2013–2014, and Hospital Mental Health Database, 2006–2007 to 2012–2013, Canadian Institute for Health Information; Alberta Ambulatory Care Database, 2006–2007 to 2009–2010, Alberta Health Services. Population estimates: Statistics Canada, Demography Division.

Psychotropic Medication Use

For children and youth diagnosed with serious mental disorders, psychotropic medications are often prescribed and may be a first-line intervention when combined with psychosocial therapy. Although there have been advances in the development of medications for mental disorders, much of the research has been conducted among adults and there are relatively few psychotropic medications that are explicitly approved in Canada for administration to youth. Because many of these medications have serious side effects, concerns have been raised about their appropriate use and whether there is sufficient clinical monitoring of youth taking these medications.¹³

The analysis of treatment focused on psychotropic medications used for the most serious mental disorders affecting youth: mood disorders (including depression and bipolar disorder), anxiety disorders and schizophrenia. Factors that might affect the prevalence of medication use and trends in use that were explored include age, gender, neighbourhood income, urban versus rural residence and medication class. The list of the psychotropic medications used to identify the cohort and details regarding the analysis can be found in the technical notes available on the [website](#).

Use of Psychotropic Medications Was Common and Increased Over Time

In 2013–2014, 6.5% (61,503) of youth living in B.C., Saskatchewan and Manitoba were dispensed at least 1 medication to treat a mood or anxiety disorder, and 1.6% (14,894) of youth were dispensed at least 1 antipsychotic medication. By health region within jurisdictions, there was considerable variation in pharmacotherapy rates. The prevalence of youth dispensed psychotropic medications has increased since 2007–2008. Specifically, there was a 23% increase in youth dispensed mood or anxiety medications (an average of 2,290 additional youth each year) and a 45% increase in youth dispensed antipsychotic medications (an average of 843 additional youth each year). The findings support other studies showing that the use of psychotropic medications among youth has increased in recent years.^{31–33} The rates reported here are comparable to those reported in the U.S.^{34, 35} The overall prevalence of medication to treat a mood or anxiety disorder is still below the population prevalence of mood and anxiety disorders, which may illustrate under-treatment of these disorders. Unfortunately, these or other considerations cannot be determined with the data currently available. Conversely, rates of antipsychotic medication prescription have increased to 1.6%, higher than the rate of schizophrenia and bipolar disorder (about 1% of the population between the ages of 15 and 25), for which antipsychotic medications are indicated as a first-line treatment.

According to 2013–2014 data from the First Nations Inuit Health Branch of Health Canada (FNIHB), pharmacotherapy rates were higher for youth whose prescriptions were paid for by FNIHB as compared to those dispensed in B.C., Saskatchewan and Manitoba. Within FNIHB 7.6% of youth were dispensed at least 1 medication for mood and anxiety disorders, and 2.5% were dispensed at least 1 antipsychotic medication. Children and youth living in First Nations communities are at a higher risk for mental disorders such as depression, and their rates of completed suicides are significantly higher than the national average.⁴

Increasing Prevalence Was Linked to the Most Common Medications, and Only Occurred Among Youth Living in Urban or Suburban Areas

Youth Living in Urban or Suburban Areas Being Dispensed SSRIs

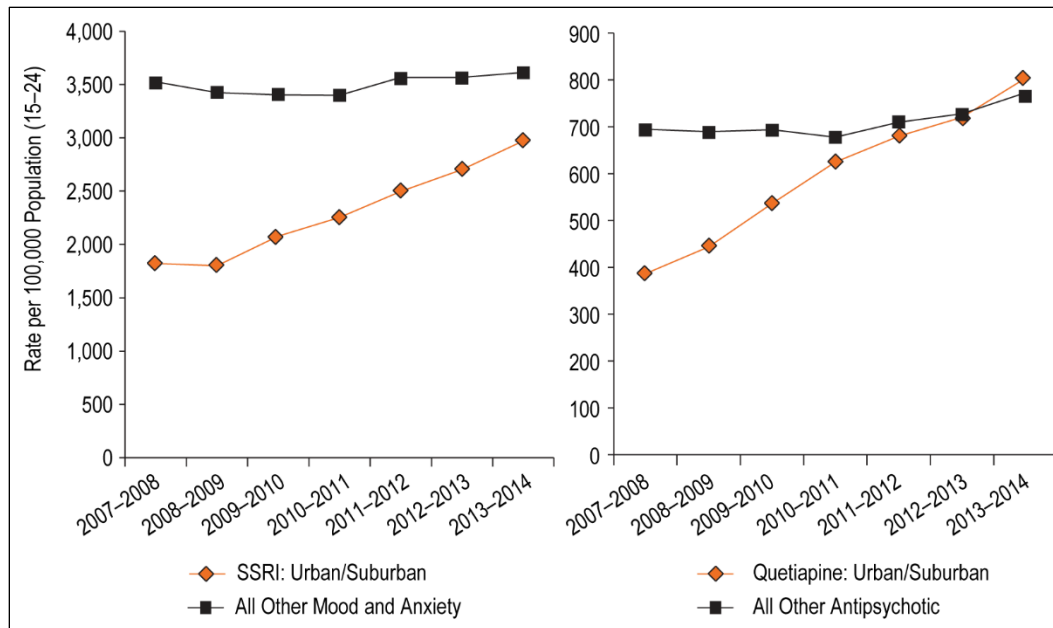
Overall, 83% of the increase in the use of mood and anxiety medications is accounted for by youth living in urban or suburban areas being dispensed 1 medication class—selective serotonin reuptake inhibitors (SSRI) (Figure 6). In 2013–2014, 3.9% of youth were dispensed SSRIs, making them the most commonly used mood and anxiety medication. Anxiolytics (benzodiazepines) were the second most commonly used mood and anxiety medication (2.2% of youth were dispensed these medications in 2013–2014) and the only other medication class with an increase in prevalence during the study period.

The increase in mood and anxiety medication use is largest for 15-year-olds, and tapers off for older youth. The rate increase among youth under age 19 was nearly 5 times higher than for youth 19 and older (52% versus 11%, respectively).

There were no significant effects of gender or neighbourhood income on the trends over time in mood and anxiety medications. However, females were consistently twice as likely as males to be dispensed a medication for a mood and anxiety disorder throughout the study period. This is consistent with what is known about the prevalence of these disorders by gender.^{1, 30}

Changes in medication labelling and controversy over the use of SSRIs over the period could, in part, account for the observed increase in their use in this age group. There was a decrease in SSRI use following a 2004 Health Canada warning of serious side effects of the medication when taken by children and adolescents.^{36–39} The rapid rise in SSRI use could represent a return to these medications by physicians following publications of studies showing that, for most patients, the benefits of the medications outweighed their risks.^{40–45}

Figure 6: Left—Prevalence of SSRIs Among Urban and Suburban Youth Relative to All Other Youth Dispensed Mood and Anxiety Medications, 2007–2008 to 2013–2014
 Right—Prevalence of Quetiapine Among Urban and Suburban Youth Relative to All Other Youth Dispensed Antipsychotic Medications, 2007–2008 to 2013–2014



Note

Includes claims data for B.C. and Manitoba (see Appendix B).

Source

National Prescription Drug Utilization Information System Database, 2007–2008 to 2013–2014, Canadian Institute for Health Information.

Youth Living in Urban or Suburban Areas Being Dispensed Quetiapine

Quetiapine (Seroquel® and generics) has been available in Canada since 1998. It is approved in adults for schizophrenia, bipolar disorder and, as of 2010, major depressive disorder refractory to treatment with antidepressants.⁴⁶ It is widely prescribed in low doses for management of sleep disorders, despite lacking specific approval for this indication.^{46, 47} There is also evidence that antipsychotics are increasingly being used to treat conditions other than schizophrenia and psychoses (e.g., ADHD, conduct disorder and symptoms associated with autism spectrum disorders).^{32, 48, 50–52}

As illustrated in Figure 6, 80% of the increase in use of antipsychotic medications is accounted for by youth living in urban or suburban areas being dispensed 1 medication, quetiapine. The general finding of increased use of antipsychotic medications to treat youth with mental disorders is consistent with other studies.^{48, 49} The increase in use of antipsychotics is of some concern because there is limited evidence of their effectiveness and safety.^{53, 54} In Canada, aripiprazole

is the only medication included in this study that has been approved by Health Canada for use in youth. It is approved to treat youth age 15 to 17 diagnosed with schizophrenia and those age 13 to 17 with bipolar I disorder.³² An analysis of trends for each atypical antipsychoticⁱⁱⁱ medication showed an increase in aripiprazole dispensing during the most recent 3 years; however, as of 2013–2014 it was prescribed less frequently (125 per 100,000) as compared to risperidone (469 per 100,000) and quetiapine (972 per 100,000). The rates for quetiapine doubled over the study period. Aripiprazole is the only other antipsychotic medication to have a prevalence increase during the study period.

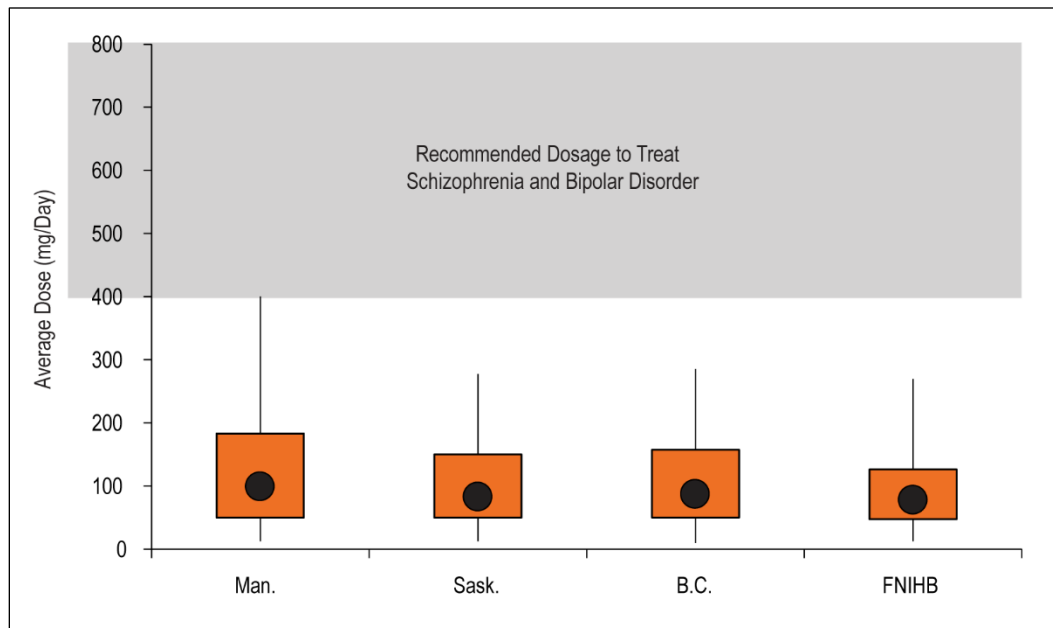
As was the case with SSRIs, the increasing use of quetiapine was only seen in youth living in urban or suburban areas. There was no consistent difference in rates of antipsychotic medication use by age, gender or neighbourhood income.

To shed light on the intended use in relation to U.S. Food and Drug Administration (FDA) recommendations, the use of quetiapine was further analyzed by dose. The FDA recommended dose to treat schizophrenia and bipolar disorder in youth is 400 to 800 mg/day (following a 5-day increasing dosing regimen). FDA guidelines state that quetiapine dosages less than 150 mg/day should not be prescribed for more than 30 days, except in elderly and debilitated patients, and prescriptions for greater than 30 days should be reviewed.

Youth dispensed quetiapine were split into 2 groups: chronic users (i.e., received at least 2 prescriptions and dispensed at least 180 days' supply over a 1-year period), and non-chronic users. Approximately 39% of youth dispensed quetiapine in 2012–2013 were chronic users.

The vast majority of youth dispensed quetiapine for chronic use had prescriptions that were below 400 to 800 mg/day, suggesting that they were being dispensed quetiapine to treat conditions other than schizophrenia (Figure 7). Analysis of patient-level dose (average dose over the duration of treatment with quetiapine during the year) showed that across all 4 jurisdictions, 75% of chronic users had an average dose of less than 200 mg/day. For B.C., Saskatchewan and FNIHB, 90% of chronic users had an average dose of less than 300 mg/day (in Manitoba, the dose representing the 90th percentile of the range was 400 mg/day). The dosage ranges for non-chronic users were lower than those for chronic users. These low dosages (less than 150 mg/day) are consistent with use of quetiapine as a sleep aid, which is neither approved nor recommended.^{46, 55} However, doses used to treat youth with ADHD and conduct disorder are usually within the 150 to 300 mg/day range. Without the diagnostic data to confirm the rationale for the prescriptions, it is not possible to determine the purpose of treatment.

iii. Among youth-dispensed antipsychotic medications, the majority dispensed were atypical antipsychotics. The use of atypical antipsychotics increased markedly, while the use of typical antipsychotics was low and decreased.

Figure 7: Average Dose for Chronic Users of Quetiapine, by Jurisdiction, 2012–2013**Note**

FNIHB: First Nations and Inuit Health Branch.

Source

National Prescription Drug Utilization Information System Database, 2012–2013, Canadian Institute for Health Information.

The increase in the use of quetiapine is of some concern given the low dosages at which it is being dispensed. The absence of information on diagnosis in the current study prevents a clear understanding of why youth are being dispensed quetiapine at such low doses. However, this documented trend suggests that there may be opportunities to improve care.

Discussion of Findings

The use of ED and inpatient care by children and youth with mental disorders has increased substantially. Use of psychotropic medications is common—1 in 12 youth were dispensed a psychotropic medication in 2013–2014—and has increased over time. These findings are consistent with other research.^{31, 32, 56, 57}

Different factors are associated with the increases in hospital service use and in pharmacotherapy use. Increases in hospital service use can be accounted for by an increasing number of adolescents who visit the ED or who have an inpatient stay for a mood or anxiety disorder. While children and youth living in rural areas have higher rates of hospital service use, it is children and youth living in urban areas who are showing the greatest increase in rates of hospital use over time. Similarly, increasing prevalence of pharmacotherapy only occurred among youth living in urban or suburban areas.

Differences in Access to Mental Health Care Between Rural and Urban Settings

The finding that children and youth living in rural areas rely more on hospital services for their care aligns with other research showing a higher rate of hospital service use among people who live in rural areas for disorders such as ambulatory care sensitive conditions.⁵⁸ In addition, the overall lower rates of pharmacotherapy in rural and remote areas may indicate difficulties in accessing specialized mental health services. There are unique challenges in rural areas, including lack of specialists, lack of community service options, problems with transportation (e.g., distance from services) and limited communication (e.g., lack of cell phone coverage). Some have suggested that stigma plays a role especially in rural settings, resulting in hesitance in taking a child to mental health services and a greater reliance on the hospital sector.⁵⁹ Others have argued, however, that a greater sense of community belonging and a closer system of support among rural community members may help to mitigate some of these issues.⁶⁰ Therefore, experts suggest that addressing the unique needs of rural communities is a necessary component of any child and youth mental health policy.²⁷

Understanding the Increases in Hospital Service Use

There are several possible explanations for the trend of increased hospital service use for children and youth with mental disorders. These could include increases in the prevalence of mental disorders, improvements in the ability to identify and treat youth with mental disorders, a reduction in stigma resulting in more youth seeking help and/or reliance on hospital care and psychopharmacology in the face of limited and fragmented access to services in community settings.

While mental health care service utilization rates are on the rise, there is little evidence of a significant increase in the underlying incidence or prevalence of mental disorders among youth.^{61, 62} One study using data from the NLSCY showed no increase in the rate of depression and other disorders (other than ADHD) between 2001 and 2009.⁶² While there have been some increases in the self-reported prevalence of mood disorders among 12- to 19-year-olds, as well as in the number of youth reporting “fair to poor” mental health between 2010 and 2013,⁶³ these increases could be related to a true increase in mental disorders or a greater willingness on the part of youth to report mental illness or mental distress. Self-reports of a major depressive episode or suicidal thoughts have not changed significantly when measured in the 2002 and 2012 CCHS-Mental Health surveys.¹⁰

The school setting can be a cornerstone of mental health literacy, mental health promotion, identification of mental health problems and disorders and delivery of much-needed care for children and youth.^{21, 64, 65} Efforts on the part of schools and mental health advocacy groups to raise awareness of mental health, the signs and symptoms of mental disorders and the availability of effective treatments could potentially account for the rise in the use of EDs and hospitals for care. Indeed, the current study cohort had more ED visits for mental disorders among school-age children (age 10 to 17) during the school calendar year, while the hospitalization rates among post-secondary age youth (age 18 to 24) did not vary over the course of a year. This may reflect the stressors that are a part of school life and the relief provided during holiday periods. Other initiatives such as the Bell Let's Talk campaign may also bring attention to the issue of mental health in general and encourage help-seeking behaviours (<http://letstalk.bell.ca>). Further study is needed to understand the impact of each of these considerations.

This increasing use of hospital-based services could also point to a shortage and fragmentation of community-based services, and an unmet need among children and youth seeking access to care for mental disorders. This suggestion is supported by other findings. For example, one report found that fewer than 1 in 4 children with mental disorders receive specialized treatment services.⁶⁶ A recurring theme in the Mental Health Commission of Canada's 2010 report, *Evergreen: A Child and Youth Mental Health Framework for Canada*, was the challenge that youth and their families face trying to access mental health services.²⁷ There was an identified lack of integration in services, funding cuts resulting in reductions in available services, and a system not designed to best meet the users' needs. For example, wait times are often identified as a significant barrier to receiving mental health care, and children and youth may experience deterioration of their mental health to the point of crisis while on a wait list for intervention.¹⁷ In addition, appointments are often only available during traditional working hours.

The family physician only referred to hospital-based ambulatory services, they did not know about community-based services. All services had wait lists with wait times of more than 1 year. Hospital-based social workers did not know about community-based services.

—Parent of a child with lived experience

Links to Primary Care Among Children and Youth With Mental Disorders

Many suggest that better coordination between primary health care and other providers (including hospitals and community service agencies) may reduce avoidable hospitalizations and readmissions. While information on integrated care is limited in Canada, other countries are farther ahead. For example, as part of its National Mental Health Strategy, Australia has implemented a set of mental health indicators including pre-admission community care and post-discharge community care.⁶⁷

Using both hospitalization and physician billing data from Alberta, CIHI was able to determine the proportion of children/youth age 5 to 24 who had pre-admission or post-discharge physician visits in 2012–2013.

There were 15,782 encounters with the ED, inpatient care or both. These were then linked to the Alberta physician billing data to determine the rate of contact with a primary care provider before and/or after the encounter. The main findings from this analysis were that

1. Very few episodes in the ED and/or inpatient care were preceded by contact with a physician in the community for a mental health concern in the previous 7 (13%) or 30 days (23%). Episodes involving schizophrenic and psychotic disorders, mood disorders and personality disorders were more likely to have had contact with a physician prior to their episode.
2. More episodes had follow-up contact with a physician within 7 (21%) or 30 days (36%) post-discharge. Most follow-up was with a family physician (47%) or psychiatrist (48%); a small number was with a pediatrician (4%).
3. Few episodes had both prior contact and follow-up with a physician (14%), and only half involved the same physician.

In comparison, Mental Health Services in Australia reported in 2012 that 41% of hospital admissions had a preceding community contact and 61% had follow-up within 7 days of discharge. As the analysis described above is limited to data from Alberta, some caution is required in terms of generalizing these results. However the analysis shows that there is room for improvement in ensuring appropriate continuity of care for children and youth dealing with mental disorders.

Note

This analysis looks at contact only with a physician—care may have been provided by a health practitioner other than a physician. In addition, it is possible in some cases that the visit categorized as community-based took place in hospital.

Sources

Patient-Level Physician Billing Data Repository, Discharge Abstract Database and National Ambulatory Care Reporting System, 2012–2013, Canadian Institute for Health Information.

The Mental Health Commission of Canada's 2012 mental health strategy called for immediate increases in funding for mental health programs, yet according to the Canadian Mental Health Association, the overall mental health share of health spending has declined to 5% in 2014 from 11% in 1979. Some have argued that the lack of an increase in funding translates into a reduction in available community-based services for children and youth with mental disorders.⁶⁸ This in turn may result in a revolving door through the ED and subsequently inpatient care for children and youth with mental disorders.¹⁷ This, at least in part, could help to explain the increase in hospital service use.

Do Pharmacotherapy Rates Indicate Potential Overuse or Inappropriate Use?

The overall prevalence of medication to treat a mood or anxiety disorder is below the population prevalence of mood and anxiety disorders. However, given the recommendations for use of these medications to treat this age group and unmet need discussed above, these rates may in part be influenced by overuse of medication as a treatment option. Possible examples of overuse include overreliance on pharmacotherapy as a first-line treatment and/or use of these

medications for unapproved diagnoses. Concerns have been raised over the potential overuse of psychotropic medications for youth in Canada and other developed countries.⁶⁹ However, without linking medication prescriptions to diagnoses, it is not possible to determine whether psychotropic medications are being overused, are being underused or are within expected rates of use.

Whether the increase in use of these medications is inappropriate is also unclear. The rise could indicate better recognition of serious mental disorders among children and youth and clinically sound management with medication. The prevalence increase in SSRI use could represent a return to these medications subsequent to a review of the safety of these medications indicating that their benefits outweighed earlier warnings of serious side effects. Alternatively, a rise in the use of these medications could be considered potentially inappropriate if they are being used for unrelated diagnoses or as a substitute for psychosocial interventions because of an absence or shortage of providers and service capacity. The increase in the use of quetiapine reported here is of some concern given the low dosages at which it is being dispensed, if it is being used as a sleep aid.

Conclusion: Moving Forward

In ideal circumstances, there exists a system of care that includes a continuum of service: mental health promotion for all children and youth, targeted prevention for those at risk, and ongoing intervention support for those most vulnerable.^{27, 70, 71} Indeed, Canada's framework for child and youth mental health, *Evergreen*, includes substantial emphasis on upstream promotion and prevention approaches designed to build skills, reduce stigma, foster resiliency and enhance understanding.²⁷ Many Canadian jurisdictions have been working toward building a coordinated, cross-sectoral system of care that includes promotion, prevention and intervention services.^{65, 72, 73}

“There was . . . a great divide between publicly funded services and private services, and they appeared to operate in two different worlds with no communication between them.”

—Parent of a child with lived experience

Continuing the forward momentum in supporting the mental health of our children and youth is critical. Steps are being taken by the provinces and territories to address the challenge of child and youth mental health, and much progress has been made. Continued monitoring of health care utilization over time is important to understanding any changes in the mental health care needs of this group. Experts suggest that building capacity to deliver mental health care services to children and youth in the community, either through primary care or through the school system, is a critical piece of any strategy or framework.²¹ It might be possible, for example, to reduce the need for ED use through early identification and prevention in primary care or school settings. It is also important to ensure that the services and treatment being delivered are evidence based, effective and appropriately designed to meet the child's needs.⁷⁴

Given the greater rates of readmission and repeat visits among these patients, it is important to identify best practices in the ED and inpatient care that could help to reduce these costly visits.

Overall, better data and information are needed to understand how community mental health services contribute to the overall mental health system for children and youth, and it may help to examine the impact of stigma reduction on health care utilization. Finally, it is clear that improvement is needed in the coordination and integration of services across the continuum of care, not only in terms of front-line service delivery but also in terms of provincial funding and accountability.

Appendix A: National Longitudinal Survey of Children and Youth, Cycles 1, 4 and 8

Data from the NLSCY was used to determine the impact of several factors present earlier in life on the self-reported depression of adults between 18 and 22.

Findings:

1. Children whose primary caregivers self-reported depression when they were between 4 and 8 years old were twice as likely to report depression at age 18 to 22.
2. Children living in lower-income families at age 4 to 8 were nearly twice as likely to self-report depression in early adulthood.
3. Children who self-reported emotional difficulties at age 10 to 14 were 4 times as likely to report depression 8 years later.
4. Children who experienced higher degrees of ineffective parenting early in life were nearly twice as likely to report depression in early adulthood.
5. Other factors considered, including indications of positive interactions, aggressiveness, hyperactivity and family dysfunction, were not predictive of depression.

Table A1: Outcome: Self-Reported Depression at Age 18 to 22

Patient Factors	Unadjusted OR (95% CI)	Adjusted OR (95% CI)
Gender—Male	0.6 (0.4–0.9)	0.4 (0.4–1.0)
Parent or Caregiver Depression at Age 4–8	2.0 (1.1–3.8)	1.3 (0.7–2.5)
Low Income at Age 4–8	1.8 (1.0–3.0)	1.7 (0.9–3.0)
Ineffective Parenting	1.9 (1.0–3.5)	1.7 (0.9–3.2)
Emotional Disorder at Age 10–14	4.0 (2.3–6.9)	3.6 (2.0–6.6)

Note

OR: Odds ratio.

Source

National Longitudinal Survey of Children and Youth, Statistics Canada, Cycle 1, 4 and 8.

Canadian Survey on Disability

The Canadian Survey on Disability provides a snapshot of the experiences of Canadians living with disabilities. Data from the 2012 Canadian Survey on Disability, indicated that mental disorders were the most prevalent disability type among 15- to 24-year-olds and that this age group had the highest reports of comorbid learning and developmental disabilities.⁷⁵ The following CIHI analysis builds upon these findings, specific to 15- to 24-year-olds.

According to the Canadian Survey on Disability, there was some jurisdictional variation in the percentage of Canadians age 15 to 24 who reported having a mental health–related disability, from a low of 1.3% in Quebec to a high of 2.8% in Nova Scotia. The employment rate of 15- to 24-year-olds with a mental disorder was about half that of 15- to 24-year-olds with no disability. More than half of the respondents (52%) age 15 to 24 who reported a mental disorder felt that they were at a disadvantage in their employment due to their disability. Most of the 15- to 24-year-old respondents (98%) were enrolled in either full-time or part-time education. This is encouraging, though it is important to recognize that when all ages are considered, respondents with mental disorders had lower levels of educational attainment—26% of respondents age 25 to 44 did not complete high school. This suggests that supports for youth with mental disorders enrolled in educational programming are imperative for their academic success.

These surveys are invaluable tools insofar as they provide population-based estimates of the mental health status of Canadian children and youth, the correlates of disability and the outcomes associated with these conditions. Understanding early contributors to later depression can help direct resources to support better outcomes, such as family-based interventions to address parental depression. In addition, understanding the experience of young Canadians in the workplace and in school who are living with mental disorders will assist in future resource planning for this group and help ensure levels of achievement and success equal to that of their peers.

Further methodological details can be found in the technical notes, available on the [website](#).

Appendix B: Data Sources and Definitions

ED and Inpatient Hospitalization Analyses

Data from CIHI's National Ambulatory Care Reporting System (NACRS) was used to identify children and youth who visited the ED for mental disorders from 2006–2007 to 2013–2014 in all of Alberta, Ontario and Yukon. Other jurisdictions with partial coverage in some years include Nova Scotia, Prince Edward Island, Manitoba, Saskatchewan and British Columbia. When rates are discussed, only Ontario and Alberta are used. This time frame was used as full coverage of Ontario and Alberta is available beginning in 2006–2007. The Hospital Mental Health Database was analyzed to characterize inpatient stays for children and youth with mental disorders in Canada between 2006–2007 and 2012–2013. Data from the Discharge Abstract Database and the Ontario Mental Health Reporting System was used to characterize inpatient stays for children and youth with mental disorders in Canada in 2013–2014.

Four age groups were included in the analyses of ED visits and inpatient hospitalizations: 5- to 9-year-olds, 10- to 14-year-olds, 15- to 17-year-olds and 18- to 24-year-olds. These age groups were selected based on literature review and expert consultation. While case volumes in the 5 to 9 age group are small, significant mental health problems can and do occur in young children. Youth age 18 to 24 were identified as being of special interest because the problems they present are increasingly complex⁷⁶ and they are at an age when transitions occur between pediatric and adult care systems.

Pharmacotherapy-Related Analyses

Psychotropic medications frequently dispensed for youth with serious mental disorders fall into 2 main categories: medications that are used to treat mood disorders and anxiety, and antipsychotic medications used to treat schizophrenia and schizophrenia-related disorders. The technical notes provide a list of the psychotropic medications used to identify the cohort. Diagnostic data was not available and individuals in the study cohort were identified solely on the basis of their receipt of 1 or more of these medications.

The medication claims for youth (age 15 to 24) dispensed psychotropic medications used in this analysis come from CIHI's National Prescription Drug Utilization Information System (NPDUIS) Database, as submitted by 3 provincial public drug programs (Manitoba, Saskatchewan and British Columbia), as well as the First Nations and Inuit Health Branch (FNIHB) federal public drug program. Drug claims data from Manitoba, Saskatchewan and British Columbia was available for 2007–2008 through 2013–2014; for FNIHB, it was available from 2011–2012 to 2013–2014. The FNIHB client population decreased significantly in 2013–2014 as a result of the creation of the First Nations Health Authority (FNHA). In a phased approach, between July and October 2013, the FNHA assumed the programs, services and responsibilities formerly offered by FNIHB to First Nations clients residing in British Columbia. As a result, claims occurring in British Columbia or for FNHA clients have been excluded from October 1, 2013, onwards. Analyses that include urban/rural and neighbourhood income do not include data from Saskatchewan or FNIHB. Analyses that include drug claims data prior to 2011–2012 do not include data from FNIHB.

Note that all differences presented are statistically significant. More details on methodology are provided in the technical notes, available on the [website](#).

Appendix C: Diagnoses Included in the ED/Hospitalization Analysis

Diagnostic Category	ICD-10-CA Codes	DSM-IV Codes
Organic Disorders	F00–F09, F53.1, G30, R41.3	290.40–290.43, 293.0, 293.9, 294.0, 294.8, 294.10, 294.11, 294.9, 310.1, 780.09
Substance-Related Disorders	F10–F19, F55	291.0–291.9, 292.0, 292.11, 292.12, 292.81, 292.82–292.84, 292.85, 292.89, 292.9, 303.00, 303.90, 304.00, 304.10, 304.20, 304.30, 304.40, 304.50, 304.60, 304.80, 304.90, 305.1, 305.00, 305.20, 305.30, 305.40, 305.50, 305.60, 305.70, 305.90
Schizophrenic and Psychotic Disorders	F20–F29, R41.0	295.10, 295.20, 295.30, 295.40, 295.60, 295.70, 295.90, 297.1, 297.3, 293.81, 293.82, 298.8, 298.9
Mood Disorders	F30–F33, F34.0, F34.1, F34.8, F34.9, F38, F39, F53.0	296.00–296.06, 296.40–296.46, 296.50–296.56, 296.60–296.66, 296.7, 296.80, 296.89, 301.13, 296.20–296.26, 296.30–296.36, 300.4, 311, 293.83, 296.90
Anxiety Disorders	F40–F42, F93.0–F93.2, F43.0, F43.1, F43.8, F43.9	300.00–300.02, 300.21–300.23, 300.29, 300.3, 309.21, 293.84, 293.89, 308.3, 309.81
Personality Disorders	F60–F62, F68–F69	301.0, 301.20, 301.22, 301.4, 301.50, 301.6, 301.7, 301.81–301.83, 301.9
Other Disorders	F43.2, F44, F45, F48.0, F48.1, F48.8, F48.9, F53.8, F53.9, F50-F52, F54, F59, F63-F66, F70-F73, F78-F92, F93.0, F93.3, F93.8, F93.9, F94, F95, F98, F99, O99.3	309.0, 309.24, 309.28, 309.3, 309.4, 309.9, 307.80, 307.89, 302.2–302.4, 302.70–302.76, 302.79, 302.81–302.85, 302.89, 302.9, 306.51, 607.84, 608.89, 625.0, 625.8, 300.12–300.16, 300.19, 300.6, 300.11, 300.7, 300.81, 300.82, 307.1, 307.50, 307.51, 307.42, 307.44–307.47, 312.30–312.34, 312.39, 290.40-290.43, 316, 300.9, 299.00, 299.10, 299.80, 302.6, 307.0, 307.20–307.23, 307.3, 307.52, 307.53, 307.59, 307.6, 307.7, 307.9, 309.21, 312.81, 312.82, 312.89, 312.9, 313.23, 313.81, 313.82, 313.89, 313.9, 314.00, 314.01, 314.9, 315.00, 315.1, 315.2, 315.31, 315.32, 315.39, 315.4, 315.9, 317, 318.0–318.2, 319

Diagnostic groupings correspond to 2012–2013 data. For information on diagnostic groupings for prior years, please contact the Mental Health and Addictions team at hmhdb@cihi.ca.

Appendix D: Text Alternative for Figures

Figure 1: Variation in Rates of Hospitalization for Youth Age 5 to 24 by Jurisdiction, 2013–2014, Canada

Jurisdiction	Patients per 100,000 Population	Lower Confidence Interval	Upper Confidence Interval
N.L.	450	411	489
P.E.I.	785	692	878
N.S.	374	348	400
N.B.	529	494	564
Que.	334	326	343
Ont.	432	425	439
Man.	352	332	372
Sask.	499	473	524
Alta.	385	373	397
B.C.	445	433	458
Y.T.	559	402	717
N.W.T.	948	780	1116
Nun.	647	511	782
Can.	409	405	414

Note

Diagnoses based on main problem (ED) and most responsible diagnosis (inpatient).

Sources

Discharge Abstract Database, Hospital Morbidity Database and Ontario Mental Health Reporting System, 2013–2014, Canadian Institute for Health Information.

Population estimates: Statistics Canada, Demography Division.

Figure 2: Change in the Rate of ED Visits and Inpatient Hospitalizations for Mental Disorders per 100,000 Population, 2007–2008 to 2013–2014, Age 5 to 24, Canada

Year	ED Visits for Mental Disorders (Percentage Change Relative to 2006–2007)	ED Visits for Other Conditions (Percentage Change Relative to 2006–2007)	Inpatient Hospitalizations for Mental Disorders (Percentage Change Relative to 2006–2007)	Inpatient Hospitalizations for Other Conditions (Percentage Change Relative to 2006–2007)
2007–2008	1.4	-0.2	1.3	-0.9
2008–2009	5.4	-0.7	0.5	-3.0
2009–2010	7.3	2.5	1.3	-3.6
2010–2011	14.7	0.5	7.0	-7.8
2011–2012	30.4	4.3	16.2	-8.6
2012–2013	37.6	3.3	27.9	-11.4
2013–2014	44.9	2.2	36.9	-14.2

Notes

ED Visits include Alberta and Ontario only.

Diagnoses based on main problem (ED) and most responsible diagnosis (inpatient).

Sources

National Ambulatory Care Reporting System, Discharge Abstract Database and Hospital Morbidity Database, 2006–2007 to 2013–2014, Ontario Mental Health Reporting System, 2013–2014, and Hospital Mental Health Database, 2006–2007 to 2012–2013, Canadian Institute for Health Information; Alberta Ambulatory Care Database, 2006–2007 to 2009–2010, Alberta Health Services. Population estimates: Statistics Canada, Demography Division.

Figure 3: Rate of ED Visits and Inpatient Hospitalizations for Mental Disorders by Age per 100,000 Population, 2006–2007 to 2013–2014, Canada

ED Visits for Mental Disorders per 100,000 Population

Year	Age 5–9	Age 10–14	Age 15–17	Age 18–24
2006–2007	111	472	1,490	1,524
2007–2008	112	482	1,479	1,543
2008–2009	128	508	1,538	1,582
2009–2010	116	521	1,566	1,607
2010–2011	129	548	1,654	1,719
2011–2012	147	646	1,938	1,910
2012–2013	154	743	2,113	1,954
2013–2014	158	793	2,278	2,041

Inpatient Hospitalizations for Mental Disorders per 100,000 Population

Year	Age 5–9	Age 10–14	Age 15–17	Age 18–24
2006–2007	38	170	450	473
2007–2008	38	178	464	468
2008–2009	38	179	464	457
2009–2010	35	186	474	454
2010–2011	37	191	523	471
2011–2012	36	216	609	492
2012–2013	34	255	708	522
2013–2014	34	279	783	552

Notes

ED Visits include Ontario and Alberta only.

Diagnoses based on main problem (ED) and most responsible diagnosis (inpatient).

Sources

National Ambulatory Care Reporting System, Discharge Abstract Database and Hospital Morbidity Database, 2006–2007 to 2013–2014, Ontario Mental Health Reporting System, 2013–2014, and Hospital Mental Health Database, 2006–2007 to 2012–2013, Canadian Institute for Health Information; Alberta Ambulatory Care Database, 2006–2007 to 2009–2010, Alberta Health Services. Population estimates: Statistics Canada, Demography Division.

Figure 4: Rate of ED Visits and Inpatient Hospitalizations for Mental Disorders by Diagnosis per 100,000 Population, 2006–2007 to 2013–2014, Canada

ED Visits for Mental Disorders per 100,000 Population

Year	Organic Disorders	Substance-Related Disorders	Schizophrenic and Psychotic Disorders	Mood Disorders	Anxiety Disorders	Personality Disorders	Other Mental Health Disorders
2006–2007	17	302	51	174	273	13	117
2007–2008	16	300	50	178	288	13	116
2008–2009	18	298	55	181	307	13	126
2009–2010	22	300	55	180	318	11	128
2010–2011	22	317	59	200	337	12	137
2011–2012	32	345	63	241	385	14	154
2012–2013	29	332	68	280	409	15	170
2013–2014	32	330	72	304	439	16	178

Inpatient Hospitalizations for Mental Disorders per 100,000 Population

Year	Organic Disorders	Substance-Related Disorders	Schizophrenic and Psychotic Disorders	Mood Disorders	Anxiety Disorders	Personality Disorders	Other Mental Health Disorders
2006–2007	2	45	50	72	16	10	83
2007–2008	1	44	49	76	18	10	85
2008–2009	1	45	53	83	19	10	89
2009–2010	2	43	53	84	20	11	90
2010–2011	2	44	56	88	23	12	95
2011–2012	2	47	56	103	25	12	103
2012–2013	2	50	58	116	29	13	113
2013–2014	2	52	61	127	33	15	119

Notes

ED Visits include Ontario and Alberta only.

Diagnoses based on main problem (ED) and most responsible diagnosis (inpatient).

“Other Mental Disorders” refers mainly to conduct, emotional and behavioural disorders.

Sources

National Ambulatory Care Reporting System, Discharge Abstract Database and Hospital Morbidity Database, 2006–2007 to 2013–2014, Ontario Mental Health Reporting System, 2013–2014, and Hospital Mental Health Database, 2006–2007 to 2012–2013, Canadian Institute for Health Information; Alberta Ambulatory Care Database, 2006–2007 to 2009–2010, Alberta Health Services. Population estimates: Statistics Canada, Demography Division.

Figure 5: Rate of ED Visits and Inpatient Hospitalizations for Mental Disorders by Rural/Urban Residence per 100,000 Population, 2006–2007 to 2013–2014, Canada

ED Visits for Mental Disorders per 100,000 Population

Year	Rural	Urban
2006–2007	1,332	875
2007–2008	1,368	893
2008–2009	1,409	921
2009–2010	1,420	947
2010–2011	1,409	1,026
2011–2012	1,543	1,173
2012–2013	1,609	1,242
2013–2014	1,640	1,320

Inpatient Hospitalizations for Mental Disorders per 100,000 Population

Year	Rural	Urban
2006–2007	360	275
2007–2008	350	284
2008–2009	342	283
2009–2010	346	285
2010–2011	352	304
2011–2012	373	328
2012–2013	401	368
2013–2014	414	397

Notes

ED Visits include Ontario and Alberta only.

Diagnoses based on main problem (ED) and most responsible diagnosis (inpatient).

Sources

National Ambulatory Care Reporting System, Discharge Abstract Database and Hospital Morbidity Database, 2006–2007 to 2013–2014, Ontario Mental Health Reporting System, 2013–2014, and Hospital Mental Health Database, 2006–2007 to 2012–2013, Canadian Institute for Health Information; Alberta Ambulatory Care Database, 2006–2007 to 2009–2010, Alberta Health Services. Population estimates: Statistics Canada, Demography Division.

Figure 6: Prevalence of SSRIs Among Urban and Suburban Youth Relative to All Other Youth Dispensed Mood and Anxiety Medications, 2007–2008 to 2013–2014, and Prevalence of Quetiapine Among Urban and Suburban Youth Relative to All Other Youth Dispensed Antipsychotic Medications, 2007–2008 to 2013–2014

SSRIs and Mood and Anxiety Medications, per 100,000 Population Age 15 to 24

Year	SSRIs Among Urban/Suburban Youth	All Other Youth Dispensed Mood and Anxiety Medications
2007	1,819	3,524
2008	1,800	3,426
2009	2,079	3,405
2010	2,254	3,401
2011	2,498	3,569
2012	2,703	3,570
2013	2,970	3,615

Quetiapine and Antipsychotic Medications, per 100,000 Population Age 15 to 24

Year	Quetiapine Among Urban/Suburban Youth	All Other Youth Dispensed Antipsychotic Medications
2007	386	695
2008	444	689
2009	537	694
2010	625	678
2011	680	709
2012	721	728
2013	803	773

Note

Includes claims data for B.C. and Manitoba (see Appendix B).

Source

National Prescription Drug Utilization Information System Database, 2007–2008 to 2013–2014, Canadian Institute for Health Information.

Figure 7: Average Dose (mg/Day) for Chronic Users of Quetiapine, by Jurisdiction, 2012–2013

Jurisdiction	Lower Extreme	Lower Quartile	Median	Upper Quartile	Upper Extreme	Minimum Recommended Dosage to Treat Schizophrenia and Bipolar Disorder	Maximum Recommended Dosage to Treat Schizophrenia and Bipolar Disorder
Man.	13	50	94	183	400	400	800
Sask.	13	50	81	150	278	400	800
B.C.	10	50	85	158	286	400	800
FNIHB	13	48	76	127	270	400	800

Note

FNIHB: First Nations and Inuit Health Branch.

Source

National Prescription Drug Utilization Information System Database, 2012–2013, Canadian Institute for Health Information.

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