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## 'Such a Scary Place for a Kid': The Impact of Adolescent Hospitalization on Adult Psychiatric Units

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Graduate Program in Epidemiology and Biostatistics  
A thesis submitted in partial fulfillment of the requirements for the degree in Master of Science  
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## Abstract

There is currently a lack of information on the prevalence of adolescent admission to adult inpatient psychiatry units and associated impacts. The purpose of this study was to explore the prevalence, determinants, and outcomes related to the hospitalization of adolescents aged 12 to 17 years on adult inpatient psychiatry units in Ontario. Using health administrative data, we constructed a cohort of adolescents with an inpatient psychiatric admission between 2007 and 2012. Of the 29,410 admissions over the study period, 30.3% occurred in an adult inpatient psychiatry unit. Older adolescents, males, people living in a rural area, and those with substance-related disorder or non-affective psychotic disorder were more likely to be admitted to an adult unit. Adolescents admitted to adult units were more likely to be discharged against medical advice and had a shorter length of stay. These findings help fill critical gaps in prior literature and have potential policy implications.

## Keywords

Mental disorders, adolescent, inpatient psychiatry, adult inpatient psychiatry unit

## Acknowledgments

I would like to start by acknowledging my thesis supervisor, Dr. Kelly Anderson, for her steadfast support, patience and understanding throughout my time in the graduate program. Thank-you for supporting me to pursue a career while finishing my thesis, without your encouragement and guidance I would not have reached the finish line. I am truly grateful for your mentorship and that you would always make time to chat. You have allowed me to flourish as a researcher, professional and a person and for that I am thankful.

I would also like to thank my supervisory committee, Dr. Kathy Speechley and Dr. Guangyong Zou. Thank you for the valuable contributions to this thesis through providing guidance and feedback throughout my long journey.

I would also like to thank Dr. Javeed Sukerha for meeting with me to discuss how the results from my study could impact clinical outcomes. Additionally, many thanks to my fellow graduate students for the amazing memories, support and friendship. Without you, the program would not have been the same.

A very special thank-you goes out to my husband, family and friends for your encouragement and unyielding support. Mike - thank you for supporting me to pursue another graduate degree. Without your endless love and support throughout the process I wouldn't be where I am today. Thank you to my parents and brother for always believing in me and cheering me on.

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## Chapter 1 : Introduction

Mental disorders are a major burden for adolescents world-wide in terms of cost, disability, mortality, and productivity.<sup>1-3</sup> Nearly 75% of lifetime mental disorders have their first onset during adolescence or early adulthood.<sup>4</sup> Approximately 15 to 21% of young people in Canada have at least one diagnosable mental health disorder. Without appropriate treatment, children and adolescents with mental health issues can become “more vulnerable and less resilient” with time.<sup>5</sup> The emphasis on the importance of early treatment among youth has led to a focus on adolescents and young adults, who are identified as a strategic target group provincially.<sup>6</sup> Although adolescence is defined in many different ways, operationally the definition is important for health service provision. Child and adolescent care in Ontario covers young people from birth until the day of their 18<sup>th</sup> birthday, at which point youth are expected to transition to adult services.<sup>7,8</sup> Due to the rigid age restrictions for many health and social services, the concept of “transitional age youth” has become a topic of interest. Transitional age youth can be defined as the group of people between older adolescence (15 to 16 years of age) and young adulthood (24 to 26 years of age).<sup>9,10</sup> There are many factors that make transitional age youth a vulnerable group needing attention. These young people often do not receive the specialized treatment or care they need.<sup>11,12</sup> Barriers to treatment-seeking include stigma, living in a rural area, lack of knowledge about services, and wanting to handle their symptoms on their own.<sup>13,14</sup>

Additionally, transitional age youth can experience a disruption of care or disengage from care while transitioning out of child mental health services to adult mental health services, and this disruption can have negative influences on their health.<sup>15</sup> Disengagement from services has been associated with increased risk of suicidal behaviour, an increased likelihood of hospital admission, and greater social impairment.<sup>16</sup> To add a layer of complexity to the issue, the transition to adulthood is a journey that involves deep change physiologically, psychologically, and socially for youth generally, and adding the stress of a mental disorder makes this time period even more difficult for these young people.<sup>17</sup> In addition to evidence that transitional age youth experience a decline in use of outpatient services, a study of a population-based sample in the United

States found that the use of inpatient services by transitional age youth increased over the same time period.<sup>12</sup> Canadian data shows that over a five year period there was a significant increase in psychiatric hospitalizations and mental health emergency department visits that resulted in inpatient stays.<sup>18,19</sup> This growing demand for acute psychiatric care will place a burden on the already constrained resources of hospitals, which may leave no other option but to accommodate adolescents on an adult psychiatry unit.

Internationally, England and Scotland have legislated that anyone under the age of 16 cannot be admitted to an adult psychiatric unit.<sup>20,21</sup> More locally, the Ontario Network of Child & Adolescent Inpatient Psychiatry recommends that child and adolescent psychiatric units should be separate from adult units and, where possible, adolescents should not receive care from adult psychiatric units.<sup>22</sup> Studies report that when youth were admitted to adult units, they were fearful for their safety, felt isolated, were uninvolved in decision making, and in some cases the youth felt that their condition worsened.<sup>7,23,24</sup> A survey of adult psychiatric inpatient staff found that these clinicians expressed concern over admitting a teenager in their unit due to safety issues, the heightened vulnerability of youth, psychological impact of being around many unwell adults, and the potential for maladaptive behaviours to develop.<sup>25</sup> There are also concerns when mixing youth with recent-onset mental disorders with chronic psychiatric patients, potentially exacerbating their symptoms and leading to avoidance of health services in the future.<sup>26,27</sup>

There is currently a paucity of information on the prevalence of youth admission to adult psychiatric units and the associated impacts of this practice, both nationally and internationally. The one exception is one prior Canadian study that assessed the socio-demographic and clinical factors associated with length of stay for youth between the ages of 12 and 19 years admitted to adult mental health beds in Ontario.<sup>28</sup> Stewart et al., found that length of stay was associated with age, gender, certain diagnoses, education, and discharge against medical advice.<sup>28</sup> Additionally, readmission was associated with age, living situation, and certain diagnoses.<sup>28</sup> However, this study did not estimate the prevalence of adolescent admission to adult beds among all adolescent psychiatric

admissions, or examine its impact of an adult admission on patient outcomes, relative to adolescents admitted elsewhere. To fill in this knowledge gap, the present study aimed to determine the prevalence, determinants, and outcomes related to the hospitalization of youth aged 12 to 17 years on adult inpatient psychiatric units in Ontario.

## 1.1 Role of the Student

The student was responsible for all segments of the study except the database creation. The data used for this study were obtained from the Canadian Institute for Health Information through the Graduate Student Data Access Program. The application for the Graduate Student Data Access Program was created by the student with input from the supervisor (Dr. Kelly Anderson). Consultation and guidance was provided by the student's thesis committee throughout the study (Dr. Kelly Anderson, Dr. Kathy Speechley, and Dr. GY Zou).

## 1.2 Thesis Structure

This thesis consists of five chapters. Chapter 2 provides an overview of the current literature on adolescents and transitional age youth, mental disorders during adolescence, and adolescent admission to adult psychiatric units. This leads to the study rationale and objectives. Chapter 3 provides a detailed description of the methods, including the study design, the data source, the study population, covariates, outcomes of interest, and the data analysis strategy. Chapter 4 summarizes the study findings, and Chapter 5 provides a discussion of the findings and the study strengths and weaknesses. Chapter 5 also discusses the implications the results have in relation to health policy, health system structure, and clinical practice and provides suggestions for future research.

## Chapter 2 : Literature Review

### 2 Chapter Overview

This section provides a review of the literature related to adolescent admission to adult psychiatric inpatient units. Section 2.1 discusses the definitions of adolescence and transitional age youth commonly used in the literature, and describes the parallel transitions faced by this age group. Section 2.2 gives an overview of mental disorders during adolescence, the associated help-seeking behavior, as well as describing inpatient and outpatient care. Lastly, Section 2.3 describes the current state of knowledge on adolescent admission to adult psychiatric units.

#### 2.1 Adolescence and Transitional Age Youth

There are a variety of definitions of adolescence in the literature. The World Health Organization defines adolescents as young people between the ages of 10 and 19.<sup>2</sup> The Canadian Pediatric Society has chosen to use a functional definition that does not bound the period of adolescence to the person's chronological age.<sup>29</sup> This definition states: "Adolescence begins with the onset of physiologically normal puberty, and ends when an adult identity and behaviour are accepted."<sup>29</sup> Other definitions have proposed that a broader age range of 10 to 24 years old would correspond more closely with the developmental changes experienced during this time period.<sup>30</sup> Still other organizations have adopted more restrictive definitions, limiting to ages 13 to 19 years or 12 to 16 years.<sup>31-33</sup> Adolescence is also described as a "period of rapid and extensive psychological and biological growth."<sup>34</sup>

Operationally, the definition of adolescence is important for health service provision. Child and adolescent care in Ontario covers the period from birth until the date of a person's 18<sup>th</sup> birthday.<sup>7,8</sup> In the case of mental health service delivery, funding is pooled across the Ministry of Health and Long-term Care and the Ministry of Children, Community and Social Services. Other ministries also provide funding for community

services that help people with mental health and addictions, such as housing, justice, youth employment, and education.<sup>5,8,35,36</sup> The Ministry of Children and Youth Services is mandated to provide care until youth reach the legal age of consent (17 years and 264 days).<sup>8</sup> Therefore, after their 18<sup>th</sup> birthday, adolescents are required to transition to adult care. Services use this strict definition of adolescence due to organizational budgetary restraints and case load restrictions, but these definitions do not necessarily take into consideration the other aspects that define adolescence.<sup>37</sup>

With the rigidity of age restrictions for child and youth services, the concept of “transitional age youth” has become a hot topic. Similar to the definition of adolescence, there is some variation regarding who is considered a transitional age youth. The United Nations Educational, Scientific, and Cultural Organization defines this group as people between the ages of 15 and 24 years who are in a period of transition from the dependence of childhood to adulthood.<sup>9</sup> Transitional age youth has also been defined as youth between the ages of 16 and 25 years.<sup>5,12</sup> However, the most inclusive definition provided by Wilens and Rosenbaum is ‘the span from older adolescence (e.g. 15 to 16 years of age) to young adulthood (24 to 26 years of age).’<sup>10</sup> Within the context of health service provision, transition is described as “the purposeful, planned movement of adolescent and young adults with chronic physical and medical conditions from child-centered to adult-oriented healthcare systems.”<sup>38</sup>

Due to the fact that many mental disorders have their onset during childhood or adolescence,<sup>4</sup> many transitional age youth will need to go through a transition to move from child and adolescent mental health services to adult mental health services over the course of their mental health treatment.<sup>6,39</sup> The current literature examining transition from child and adolescent mental health services to adult mental health services finds wide variation in youth who made this transition, ranging from 4% to 58%.<sup>15,40,41</sup> Transitional age youth experience a variety of barriers when transitioning to adult mental health services, including not adapting to treatment changes, long waitlists, family resistance, and poor communication.<sup>5,7,15,42–45</sup>

While transitional age youth are experiencing transitions in the health care setting, there are also many other transitions that define the period of adolescence, which adds a layer of complexity to the transition from child and adolescent services to adult services. The transition to adulthood is a journey that involves profound changes physiologically, psychologically, and socially.<sup>17</sup> During this period, there are many other developmental and life transitions that may happen including, but are not limited to: i) transitioning from high school to college or university; ii) living away from home for the first time; iii) gaining employment; iv) unplanned pregnancies; and v) changes in interpersonal relationships.<sup>5,15,17,34,46</sup> Adding to the stress of these life changes, a mental disorder can make this period even more challenging for transitional age youth.<sup>17</sup> These normal developmental transitions are often difficult for youth with mental disorders to manage, while simultaneously managing symptoms related to their disorder and transitions in health care services.<sup>1,47</sup>

## 2.2 Mental Disorders during Adolescence

According to the Diagnostic and Statistical Manual of Mental Disorders (DSM-5), a mental disorder can be defined as a “syndrome characterized by clinically significant disturbance in an individual’s cognition, emotion regulation, or behaviour that reflects a dysfunction in the psychological, biological, or developmental processes underlying mental functioning.”<sup>48</sup> Mental disorders are a major burden to global health, economics, and productivity for adolescents.<sup>1,2</sup> World-wide, depression is the leading cause of illness and disability, and suicide is the 3<sup>rd</sup> most common cause of death in this age group.<sup>2</sup> In Canada, suicide is the second leading cause of death for adolescents between the ages of 15 and 19 years.<sup>3</sup>

Mental disorders will affect approximately 1 in 5 Canadians in any given year,<sup>49</sup> and nearly 75% of lifetime mental disorders have their first onset during adolescence or early adulthood.<sup>4</sup> Approximately 15 to 21% of young people in Canada have at least one diagnosable mental disorder.<sup>49</sup> The most common diagnoses in adolescents are anxiety, depression, and substance- and alcohol-use disorders.<sup>50</sup> It is estimated that the prevalence

of any anxiety disorder in a community based sample ranges from 3.1% to 17.5% during childhood and adolescence.<sup>51,52</sup> It is estimated that the prevalence of mood disorders is 11.7%, and the prevalence of any mood disorder increased nearly two-fold when comparing younger adolescents (13 to 14 years) and older adolescents (17 to 18 years).<sup>52</sup> Alcohol or substance abuse or dependence is estimated to have a prevalence between 1% to 24% in community based samples.<sup>53</sup> The age-of-onset for the most common diagnoses typically happens during the latter part of adolescence and into early adulthood.<sup>4</sup> The onset of psychotic disorders and schizophrenia also occurs throughout the latter period of adolescence (15 to 17 years) and in early adulthood.<sup>54,55</sup>

### 2.2.1 Treatment Seeking

Among the adolescents who have a diagnosable mental disorder, only one in six adolescents receive the specialized treatment they require each year.<sup>11</sup> The annual rate of usage of any type of mental health treatment (inpatient, outpatient, or residential services) in the United States has been reported to range between 34 per 1,000 for adolescents age 16 to 17 years, and 18 per 1,000 for youth between 18 and 19 years of age.<sup>12,56</sup> Another study by Merikangas and colleagues (2011) examined life-time service utilization and found that 26.1% of youth with a non-severe mental disorder, and 47.4% with a severe mental disorder, received services over their life-time. However, these proportions differed significantly across diagnoses and severity of disorder.<sup>57</sup> Youth with a diagnosis of attention-deficit/hyperactivity disorder (55% of non-severe disorder; 81.6% of severe disorder) or a behaviour disorder (32% of non-severe disorder; 72% of severe disorder) had higher lifetime mental health service use when compared with any substance use disorder (15.4% non-severe disorder; 15.4% severe disorder), any anxiety disorder (13.6% of non-severe disorder; 29.1% of severe disorder), and any mood disorder (37.8% of non-severe disorder; 37.7% of severe disorder).<sup>57</sup> Mental health service use was even lower for transitional age youth between the ages of 18 and 24 years.

With low levels of help-seeking among adolescents and transitional age youth, it is important to examine the barriers that may be deterring them from seeking treatment.



Adolescents typically identify stigma as a reason for not seeking treatment for mental disorders.<sup>13,14</sup> This barrier was also magnified if adolescents were living in a rural community.<sup>13</sup> A systematic review found that another major concern was confidentiality, and any breach in this would cause embarrassment.<sup>13</sup> Additionally, lack of knowledge about what mental health services are available, what professionals do, and the fears associated with seeking help from a service or professional that they do not know were also cited as barriers.<sup>13</sup> Related to these themes, young people typically seek help from a trusted source, such as a family member or close friend, rather than seeking help from a mental health service or professional.<sup>14</sup> Lastly, as a result of many other transitions occurring during this time period (i.e. transition to independence), many youth believe that they should be able to handle their problems and symptoms themselves.<sup>13,14</sup>

Without timely and appropriate treatment, adolescents with mental health issues become “more vulnerable and less resilient” over time.<sup>5</sup> The emphasis on the importance of early treatment has led to a focus on adolescents in recent years, who have been identified as a strategic target group provincially.<sup>6</sup> There are many factors that make them a vulnerable group needing attention. These young people often experience a disruption of care or disengage from care while transitioning out of child mental health services to adult mental health services that can have negative influences on their health.<sup>12,15</sup> There is evidence that a poorly planned transition to adult services from child and adolescent services can be linked to increased risk of non-adherence to treatment and disengagement from services.<sup>58</sup> Disengagement from services has also been associated with increased risk of suicidal behaviour, an increased likelihood of hospital admissions, and greater social impairment.<sup>16</sup>

### 2.2.2 Mental Health Treatment Setting

Treatment for mental health issues covers the continuum from community mental health care to hospital-based services.<sup>36</sup> Community mental health care ranges from community programs (i.e. clinics, primary care, schools, homecare, etc.) to residential treatment and outpatient clinics offered at the hospital.<sup>36</sup> Hospitals also provide services in the

emergency department or inpatient setting.<sup>36</sup> The next section will describe two prominent areas that adolescents seek mental health services.

Outpatient care is provided to people in the community through structured programs that can take place in a hospital or another facility (i.e. mental health clinic or community health centre).<sup>12,59</sup> Outpatient care can include services such as assessment, consultation, treatment, counseling, group therapy, and follow-up care.<sup>12,59</sup> Outpatient care is the preferred treatment option for many adolescents with mental health problems, as it is less restrictive and does not remove adolescents from their community, and is also associated with fewer negative psychosocial effects.<sup>60,61</sup>

Inpatient services are also a critical component of the mental health system, and are used when there is a need for diagnostic clarification or during times of crisis, suicidality, and other severe symptoms or impairment.<sup>22,61</sup> Inpatient psychiatric care has evolved over the past 30 years, with a decreasing length of stay and a focus on discharge planning to connect adolescents to outpatient services.<sup>61,62</sup> Hospitalization of adolescents with mental disorders is an important issue to consider, as it can contribute to feelings of loss of control for adolescents that they may be feeling in other aspects of their life and contribute to feelings of anxiety, loss of independence, and hopelessness.<sup>29</sup>

Youth report a variety of benefits and consequences associated with admissions to an inpatient unit. Adolescents most commonly cited socializing with peers and having peer support or feedback as providing a sense of normalcy during inpatient care.<sup>61</sup> Adolescents also reported staff as a key resource for learning coping strategies, and that they had a positive experience when staff developed a therapeutic relationship built on non-judgmental interactions.<sup>61</sup> Adolescents also appreciated when staff were caring, listened to their opinions, and showed empathy.<sup>61</sup> However, staff also contributed to negative experiences for adolescents during inpatient care, particularly when it was perceived that staff were taking the side of the family.<sup>61</sup> Additionally, negative experiences were reported when the unit failed to meet the developmental needs of the adolescent, and when the patients thought the units rules were too rigid.<sup>61</sup>

Greenham and Persi (2014) found that adolescents age 14 and older were significantly more likely to be admitted than their peers under the age of 14, with a higher percentage of those admitted being female (59%). In 2010, there were 183 child and adolescent psychiatry beds across 27 settings across Ontario representing a prevalence of 5.9 beds per 100,000 youth under the age of 19.<sup>63</sup>

Additionally, Pottick and colleagues (2008) found that in a population-based sample in the United States, the use of inpatient services by transitional age youth increased over this age range. In the United States, children and adolescents represent approximately 7% of total mental health inpatient admissions.<sup>64</sup> A Canadian report suggests that among adolescents aged 15 to 17 years in Ontario, there was a 54% increase in psychiatric hospitalization between 2006 and 2011<sup>18</sup>, and a 74% increase in mental health emergency department visits resulting in inpatient stays over the same period.<sup>19</sup> A similar study conducted by the Canadian Institute for Health Information found that between 2006 and 2015, there was a 67% increase in hospitalizations for children and youth (ages 5 to 24 years) with mental disorders, while hospitalizations for other conditions decreased by 18% for this age group over the same time period.<sup>18</sup> This rising demand places a burden on the already limited resources of hospitals, which may leave no other option but to accommodate youth in an adult psychiatry unit.

## 2.3 Adolescent Admission to Adult Psychiatric Units

### 2.3.1 The Policy Context

Globally, the issue of adolescent admission to adult psychiatric units would fall under Article 37(c) of the United Nations Convention on the Rights of the Child, which states: “Every child deprived of liberty shall be treated with humanity and respect for the inherent dignity of the human person, and in a manner which takes into account the needs of persons of his or her age. In particular, every child deprived of liberty shall be separated from adults unless it is considered in the child's best interest not to do so and

shall have the right to maintain contact with his or her family through correspondence and visits, save in exceptional circumstances.”<sup>26,65</sup>

At the national level, admission of children and adolescents to adult inpatient unit has been an issue on the policy agenda.<sup>20,21</sup> England has stipulated in the Mental Health Act that anyone under the age of 18 who is admitted for a mental health issue needs to be in an age-appropriate environment.<sup>21</sup> Additionally, the legislation prohibits anyone under the age of 16 from being placed on an adult psychiatric unit.<sup>21</sup> The Mental Welfare Commission for Scotland mandates similar criteria, with the addition of a form that needs to be submitted if a child or adolescent is admitted to an adult psychiatric unit.<sup>20</sup>

More locally, the Ontario Network of Child & Adolescent Inpatient Psychiatry is a committee that represents all non-diagnosis-specific inpatient units across Ontario that has collaborated to create a standard for Child & Adolescent Inpatient Mental Health.<sup>22</sup> Ten standards have been created to guide quality of inpatient mental health care for children and adolescents, of which three recommend that child and adolescent psychiatric units should be separate from adult units and, where possible, adolescents should not receive care from adult psychiatric units.<sup>22</sup> The second standard, which focuses on access to inpatient care and discharge, states referral criteria need to be created to distinguish between an appropriate and an inappropriate admission: “Section 2.3.2. Whether and under what conditions transitional age 16 and 17 year-old adolescents should be admitted to the unit as opposed to adult mental health inpatient unit or a Psychiatric Intensive Care unit.”<sup>22</sup> The third standard, which focuses on environment, rights, and dignity, states: “3.1. The child and adolescent unit should be separate from the adult unit. 3.1.1. Ideally children should receive inpatient services on child units, and adolescents on separate adolescent units rather than adult units.”<sup>22</sup> Lastly, the sixth standard focuses on health promotion activities and stipulates that the unit should provide opportunities to learn and practice good habits, including things such as school work, recreation, socialization, and personal care.<sup>22</sup>

### 2.3.2 The Research Context

There is currently a paucity of information on the frequency of youth admission to adult psychiatric units and associated impacts of this practice, both nationally and internationally. A study conducted by Worrall et al. (2004) in England & Wales estimated that 45% of adolescent admissions (n = 2,100) were to an adult psychiatric unit each year, with 60% of these admissions deemed to be inappropriate by a panel of experts.<sup>23</sup> However, these estimates assumed that there were no eligible admissions from units that did not respond, and given the high non-response rate these numbers are likely underestimated.<sup>23</sup> Of the adolescents under the age of 18 admitted to psychiatric units between 1989 and 1995 in Northern Ireland (n = 1,021),<sup>66</sup> 43% were admitted to an adult psychiatric ward.<sup>66</sup> Limb (2014) also reports a 44.6% increase in the number of adolescents admitted to adult psychiatric units in England between 2011 and 2014.<sup>67</sup> There are currently no available data on the frequency of this practice in the Canadian context.

Despite the lack of research on the prevalence of adolescent admission to adult psychiatric units among adolescent psychiatric admissions, there are a few notable studies describing socio-demographic and clinical factors associated with youth admitted to adult inpatient psychiatric units. A Canadian study by Stewart, Kam, & Baiden (2014) described the socio-demographic and clinical factors of adolescents between the ages of 12 and 19 years admitted to adult psychiatric beds in Ontario, and examined the impact of these factors on length of stay and any readmission.<sup>28</sup> Between October 2005 and March 2010 there were 2445 adolescents admitted to adult psychiatric beds across 69 hospitals.<sup>28</sup> Adolescents admitted to adult psychiatric beds in this sample tended to be older (mean 17.7 years) with approximately equal proportions by gender. Over half of these adolescents had a primary diagnosis of mood disorders, one quarter had a substance-use disorder diagnosis, and 22% were diagnosed with schizophrenia.<sup>28</sup> The proportion of variance in length of stay that could be explained by the explanatory variables was 12.9%.<sup>28</sup> Adolescents admitted to adult psychiatric beds had a shorter predicted length of stay if they were female, discharged against medical advice, or had a diagnosis of adjustment disorder.<sup>28</sup> Adolescents admitted to adult psychiatric beds had a

longer length of stay if there was an education or work disruption, older age, or a diagnosis of schizophrenia, eating disorder, personality disorder, or intellectual disability.<sup>28</sup> The second study outcome was any readmission. Youth who were older, had police involvement, those living in a group home, those with a history of sexual abuse, who had a dysfunctional family, or had a diagnosis of schizophrenia, mood disorder, eating disorder, personality disorder or intellectual disability were more likely to be readmitted.<sup>28</sup>

A study by Park, McDermott, Loy & Dean (2011) in New Zealand describes the socio-demographic factors associated with admission to an adult psychiatric unit and the association with length of stay.<sup>68</sup> Between January 2002 and December 2007, there were 332 adolescents admitted to the adult psychiatric unit.<sup>68</sup> The adolescents admitted to the adult psychiatric unit were more frequently Caucasian (57.5%) or Maori (39.4%), with a mean age of 16.5 year-old (SD = 1.1), with the most common primary diagnoses being mood disorder and psychotic disorder.<sup>68</sup> The average length of stay was 7.2 days (SD 12.6).<sup>68</sup> Boys stayed almost twice as long as girls, and involuntary admission increased the length of stay.<sup>68</sup>

However, none of these studies had a comparison group of youth admitted to pediatric or other non-psychiatric adult units, so we are unable to ascertain factors associated with youth admission to an adult unit or the consequences of this practice.

### 2.3.3 Youth Perspectives

Although quantitative research on admission of adolescents to adult psychiatric units is limited, there are a number of small studies that examine youth experience on adult psychiatric units. A common theme cited in each of the studies was that adolescents were fearful for their safety during admission and that the admission provided a great deal of stress.<sup>26,66,7,69</sup> When adolescents are admitted to an adult psychiatric unit they are often much younger than other patients, and often describe older patients as ‘unpredictable’ or aggressive.<sup>26,66,69</sup> Isolation is also a common complaint by adolescents admitted to adult

psychiatric units.<sup>26,66,69</sup> Often times when describing their admission they will say that their time was spent “watching the wall, smoking cigarettes, eating, and sleeping.”<sup>26</sup> Due to the age difference of other patients, there were not many activities on the unit geared to their age group, they did not feel comfortable sharing in a group setting, and most adolescents found it difficult to make friendships.<sup>26,66</sup> Another common theme reported was a lack of information provided and lack of involvement in treatment planning and discharge planning.<sup>26,66,69</sup> These concerns were also echoed by the adolescents’ parents.<sup>26</sup> Adolescents wanted to meaningfully engage with staff members, but generally felt that staff members did not have the time or desire to engage with youth.<sup>26</sup> In a study by Wheatley et al. (2013) looking at the experiences of female adolescents after transferring from a secure adolescent inpatient psychiatric unit to a secure adult inpatient psychiatric unit, one of the strongest themes to emerge was the importance of therapeutic relationships between the adolescents and staff.<sup>69</sup> In a study by the Children’s Commissioner for England (2007), youth who had experienced both a pediatric psychiatric unit and an adult psychiatric unit reported receiving better and more personalized care, with more activities for them to participate in, when hospitalized on a pediatric unit.<sup>26</sup>

These themes are also consistently reported in the literature of adolescents’ admission to adult units, regardless of unit type or diagnosis. Adolescents report feeling out of place, having difficulty creating therapeutic relationships with staff, and fearing for their safety. They also report that these experiences may lead them to avoid the hospital in the future.<sup>29,70</sup>

### 2.3.4 Staff Perspectives

A study conducted by Curran et al. (2011) aimed to describe the attitudes and experience of staff members working with adolescent patients admitted to adult psychiatric units.<sup>25</sup> They surveyed a variety of adult psychiatric inpatient clinical staff in Australia and found that clinicians expressed multiple concerns over admitting a teenager on their unit.<sup>25</sup> When asked whether they felt their facility was equipped to care for adolescents, 30.7%

felt they were ‘not at all’ equipped, followed by 57.4% feeling they were ‘only a little’ equipped.<sup>25</sup> In another portion of the survey, where the researchers provided clinicians with an example adolescent in a vignette, only a slight majority of clinical staff (56.4%) reported they felt moderately or very confident in treating them.<sup>25</sup> When asked what concerns they would have if the patient from the vignette was admitted to their facility, the staff cited concerns such as safety, the heightened vulnerability of youth, lack of resources, psychological impact of being around many unwell adults, the potential for maladaptive behaviours to develop, and staff lacking skills for treatment.<sup>25</sup> These findings are consistent with other research, with additional concerns cited including mixing youth with recent-onset mental disorders with chronic psychiatric patients, potentially exacerbating their symptoms, as well as concerns regarding their ability to provide activities to fit all patients’ needs to avoid loneliness or boredom, and leading to avoidance of health services in the future.<sup>26,27</sup>

Although there are concerns with treating adolescents on an adult unit, 68.5% of clinicians reported that there are situations where an adult admission may be more appropriate for an adolescent even if an adolescent bed was available. These reasons include: (i) the adolescent is living an adult lifestyle (i.e. not in school, living on their own, etc.); (ii) the adolescent may be aggressive with other patients; (iii) the facility with an adult bed is closer to their family than the facility with an adolescent bed; or (iv) the admission is brief.<sup>25</sup>

### 2.3.5 Why Might an Adult Admission be Appropriate?

Policy guidelines and research findings suggest that adolescents should not be admitted to an adult inpatient unit, however the practice can be explained by a variety of factors. For example, England has created legislation to stop placement of adolescents in adult psychiatric units, but it provides two criteria for adolescents to be admitted to an adult ward: 1) Overriding need – for the safety of the adolescent or for the safety of others; or 2) Atypical need – if clinicians feel an admission to an adult unit is more appropriate than an adolescent unit.<sup>21</sup> An example of overriding need is if there is no bed available in a



child and adolescent unit and the adolescent is in crisis, then they should be admitted to an adult unit for the briefest possible time.<sup>21</sup> An example of atypical need would be if the adolescent has adult roles (i.e. is no longer in school) and would benefit from treatment on an adult unit.<sup>21</sup> Some adolescents have a need for autonomy that often is not provided in a child and adolescent inpatient setting.<sup>22</sup>

As mentioned previously, with rising rates of inpatient service utilization by adolescents, there may be no other option than to treat them on adult psychiatric units.<sup>23,71</sup> There are also cases where adolescents do not live near a hospital with a child and adolescent unit.<sup>23,71</sup> This poses the question whether separating an adolescent from their home and support system is worth the risks posed by adolescent admission to an adult psychiatric unit.<sup>71</sup>

### 2.3.6 Why Might an Adult Admission not be Appropriate?

In addition to concerns mentioned above, there are additional reasons an admission of an adolescent to an adult psychiatric unit may not be appropriate. An admission to an adult inpatient unit may not be appropriate when considering developmentally appropriate care.<sup>7</sup> Child and adolescent inpatient units often provide adolescents with services to continue their education during their admission, thereby aiding in school re-entry and providing a sense of normalcy.<sup>22,26</sup> An admission to an adult unit where adolescents may not have the opportunity to work on their education can cause added stress and lead to the adolescent falling behind in their studies.<sup>22,26</sup>

Additionally, socialization is an important aspect of adolescence, and youth report needing the opportunity to connect with peers their age.<sup>22,66,72</sup> Adolescents preferred to connect with a peer around the same age, and staff identified this as an opportunity for peer support to create a therapeutic community that can promote youth to share their experiences more openly and participate in group activities on the unit.<sup>22,66,72</sup>

A recent systematic review found that child and adolescent mental health services often take a developmental approach to providing care, tending to involve families in treatment or decision making, and provided a more nurturing environment.<sup>7,73</sup> In contrast, adult mental health services often took a more clinical approach to providing care, emphasizing patient autonomy and individual responsibility.<sup>7,73</sup> A study conducted by Richards and Vostanis (2004) report that health professionals on adult psychiatric units often did not take into account the unique social, emotional, and familial needs of youth ages 16 to 19 year when admitted to their unit.<sup>72</sup> This difference can pose a problem if adolescents rely heavily on their family during appointments and feel unprepared to address their mental disorder or make treatment decisions on their own.<sup>7,73</sup>

## 2.4 Study Rationale

There is currently a notable lack of information on the prevalence of youth admission to adult psychiatric units and the associated impacts of this practice, both nationally and internationally. The literature to date has illustrated the issue and concern for adolescent outcomes when they are admitted to adult psychiatric units. There have been several small studies that have shown adolescents report being fearful for their safety, feeling isolated, being uninvolved in decision making, and in some cases the youth feeling their condition worsened when admitted to adult units.<sup>7,24,68,71,74</sup> Additionally, studies involving staff who work on adult psychiatric units show concern with this practice and the impact this may have on future help-seeking behaviours.<sup>13,14,25,26</sup> Action has been taken in England and Scotland, where there have been changes to policy to prohibit adolescents from being admitted to an adult inpatient unit due to the potential negative impacts.<sup>20,21</sup> Not only will this study fill a critical gap in the literature related to the prevalence of adolescent admissions to adult psychiatric units in the Canadian context, it will also examine the impact of this practice on several service-related outcome measures, when compared to admission to a child and adolescent unit. Additionally, transitional age youth are highlighted as a strategic target group provincially<sup>6</sup> and nationally,<sup>75</sup> and the findings from this study can be used to inform resource allocation to

provide clinically appropriate access to inpatient psychiatric care for adolescents in Ontario.

## 2.5 Study Objectives

The purpose of this study was to determine the prevalence, determinants, and outcomes related to the hospitalization of youth aged 12 to 17 years on adult inpatient psychiatric units in Ontario. More specifically, the objectives of the study were:

- **Objective #1:** To estimate the proportion of inpatient psychiatric hospitalizations of adolescents aged 12 to 17 years that occur in an adult psychiatric unit in Ontario. This information will be useful to determine how often adolescents are admitted to adult psychiatric inpatient units in a Canadian context;
- **Objective #2:** To examine the patient-level and institutional factors that are associated with admission of adolescents aged 12 to 17 years to an adult psychiatric unit compared to admission to a pediatric or non-psychiatric unit. This information will illustrate whether a variety of patient-level and institutional-level factors influence whether an adolescent is admitted to an adult psychiatric unit or a pediatric or non-psychiatric unit;
- **Objective #3:** To compare length of stay, discharge against medical advice, and 30-day readmission for adolescents who are admitted to an adult psychiatric unit, relative to youth who are admitted to a pediatric or non-psychiatric unit. This is important because these outcome measures could demonstrate whether an admission to an adult psychiatric unit has an impact on outcomes.

## Chapter 3: Methods

### 3 Chapter Overview

This chapter describes the methods for this study, which is based on data obtained from the Canadian Institute for Health Information. Ethics approval has been obtained from the Health Science Research Ethics Board at Western University (File #109350).

#### 3.1 Study Design

This study used data from a cohort of youth between the ages of 12 and 17 years who experienced an inpatient psychiatric admission in Ontario between April 1, 2007 and March 31, 2012. The cohort was created using two large health administrative databases that are described in the next section. For objective #2, a cross-sectional study design was used to examine patient and hospital-level factors associated with adolescent admission to an adult psychiatric unit. For objective #3, we used a retrospective cohort design to examine the impact of adolescent admission to an adult psychiatric unit on the outcomes of 30-day readmission, discharge against medical advice, and length of stay, relative to adolescents who are admitted to a pediatric or non-psychiatric unit.

#### 3.2 Data Source

The data were obtained from the Canadian Institute for Health Information through the Graduate Student Data Access Program. The Canadian Institute for Health Information is an independent, not-for-profit organization that compiles data and information related to Canada's health system and the health of the population.<sup>76</sup> The dataset was created using the Ontario Mental Health Reporting System (OMHRS) database and the Ontario subset of the Discharge Abstract Database (DAD).

OMHRS captures data from all admissions to designated adult psychiatric beds in Ontario, and includes information on a wide variety of factors such as service use, mental

and physical health, social supports, and outcomes at discharge.<sup>27</sup> Reporting to OMHRS was mandated by the Ontario Ministry of Health & Long-term Care for all new admissions to adult psychiatric units after October 1, 2005.<sup>27</sup> This database captures 97-98% of all admissions to designated adult psychiatric beds, with exclusions typically due to missing or invalid health card numbers.<sup>27</sup> Detailed clinical information is collected by mental health professionals using the Resident Assessment Instrument – Mental Health (RAI-MH).<sup>27</sup> Because OMHRS is restricted to adult beds only, the OMHRS dataset was used to identify adolescents admitted to adult psychiatric inpatient units.

The DAD captures data from all remaining hospital discharges not captured by OMHRS, and includes information on a wide variety of factors such as demographic variables, diagnoses, discharge details, provider information, and services received while in hospital.<sup>77</sup> All acute care facilities in Ontario are required to report to CIHI.<sup>77</sup> The DAD dataset was used to identify our comparison group, more specifically adolescents admitted to pediatric psychiatric units or non-psychiatric units.

There is minimal overlap in the datasets unless a patient was admitted first to a non-psychiatric unit and then transferred to a psychiatric bed during the same episode of care. This overlap was not an issue, as we limited our dataset to only include an adolescent's first admission to a psychiatric unit and we did not consider transfers between units. The two databases were linked to compile a complete dataset of all psychiatric hospitalizations among adolescents in our cohort. Patients were assigned unique patient identification numbers that were consistent across the OMHRS and DAD datasets which allowed us to identify repeat hospitalizations.

### 3.3 Study Population

Adolescents between 12 and 17 years who were hospitalized for a mental disorder in Ontario between 2007 and 2012 were included in the study. We have chosen to focus on adolescents (<18) because children only qualify to be placed on a pediatric inpatient unit until their 18<sup>th</sup> birthday.<sup>78-82</sup> Adolescents were classified as having a mental disorder if

they had a ICD-10-CA code or any DSM-IV code that fell within predetermined diagnostic categories listed in Section 3.5. If an adolescent had a diagnostic code that did not fall within the main diagnostic categories they were excluded from the cohort (See Appendix A for list of excluded diagnostic codes). The data were limited to the adolescent's first admission between April 1, 2007 and March 31, 2012.

### 3.4 Unit of Admission

The cohort was divided into two separate groups for comparison: (i) adolescents admitted to an adult psychiatry unit; and (ii) adolescents admitted to a pediatric psychiatry unit or other non-psychiatry unit (reference group). The exposure of interest was the type of unit that the adolescents were admitted to (adult psychiatric vs. pediatric/non-psychiatric unit).

The unit of admission was assigned based on the database from which the adolescent's hospitalization record was obtained. If the record was from the OMHRS dataset it was coded as an admission to an adult psychiatric unit, as during the period of interest OMHRS data were only collected for adult psychiatric beds in Ontario. If the record came from the DAD dataset, it was coded as an admission to a pediatric psychiatric unit or other non-psychiatric unit. The DAD database does not contain information on the actual unit the patient was admitted to, therefore we inferred that any adolescent who was admitted to an adult unit was represented in the OMHRS dataset, and adolescents who were represented in the DAD dataset were admitted to either a pediatric psychiatry or non-psychiatric unit.

### 3.5 Factors Associated with Unit of Admission

Several patient-level factors and one institutional-level factor were included in the analysis (Table 3.1). The patient-level variables we used included:

1. **Age** – Age was derived by subtracting the “admission date” from “patient birthdate” to give the adolescent’s age at admission. Calculated ages are rounded down to the nearest whole number. Age 15 was chosen as the reference category because it had the highest frequency.
2. **Gender** – Gender was reported as male, female, and other. There was only one observation coded as ‘other’ and was removed from the analysis.
3. **Rural vs. Urban Residence** – This variable was derived using the adolescent’s 3-digit postal code. A postal code that contains a 0 as the second digit represents a rural postal area.<sup>83</sup>
4. **Diagnosis** - The most responsible diagnosis was used to classify diagnoses. DAD reports diagnoses using the ICD-10 diagnostic criteria, whereas OMHRS uses DSM-IV diagnostic criteria. Although at first glance the ICD-10 and DSM-IV appear to be very similar, multiple studies have determined that the diagnostic criteria have important differences (i.e. required symptoms and differing diagnosis definitions).<sup>84-86</sup> A study conducted by Andrews, Slade & Peters found that the concordance between ICD-10 and DSM-IV diagnoses were an average of 68% with the lowest concordance being 33% (substance harmful use or abuse) and the highest concordance being 87% (dysthymia).<sup>84</sup> To address this issue, we opted to use broad diagnostic categories across both databases. The diagnostic categories are as follows:
  1. Substance related disorders
  2. Non-Affective Psychotic Disorders
  3. Mood/affective disorders
  4. Anxiety and adjustment Disorders
  5. Selected disorders of adult personality and behaviour (other adult).
  6. Pervasive & specific developmental disorders
  7. Behavioural & emotional disorders with onset usually occurring in childhood and adolescence
  8. Eating disorders.
5. **Hospital Type (Psychiatric vs. General Hospital)** – Hospital type was created using the “Peer Group Code” in the OMHRS dataset, where ‘Psychiatric’ or

‘Psychiatric/Teaching’ were coded as psychiatric hospital, and ‘General<25’ or ‘General>=25 beds’ or ‘General/Teaching’ were coded as general hospital. Additionally, if the variable “Peer Group Code (Retired)” in the OMHRS dataset was a ‘2’ it was also coded as general hospital. In the DAD dataset, hospital type was assigned using “analytical institution type”, where ‘Acute Care’ was coded as general hospital and where ‘Psychiatric Facility’ was coded as psychiatric hospital.

**Table 3-1: Summary of Variables for Factors Related to Adult Admission**

Variable	Values
Admitted to an Adult Inpatient Psychiatry Unit	0=Admission to a Pediatric/Non-psychiatric Unit 1=Admission to an adult psychiatry unit
Age	Age in years ranging from 12 to 17
Gender	0 = Male 1= Female 2= Other
Rural Residence	0=Urban residence 1=Rural residence
Diagnosis	1=Substance-Related Disorders 2= Non-Affective Psychotic Disorders 3=Mood/Affective Disorders 4=Anxiety and Adjustment Disorders 5=Selected Disorders of Adult Personality & Behaviour 6=Pervasive & Specific Developmental Disorders 7=Behavioural & Emotional Disorders with Onset Occurring in Childhood & Adolescence 8=Eating Disorders
Psychiatric vs. General Hospital	0=General Hospital 1=Psychiatric Hospital



## 3.6 Outcomes

Three outcomes were evaluated in this study: 1) 30-day readmission; 2) length of stay; and 3) discharge against medical advice. The binary variable 30-day readmission was generated using the variables “discharge date” and “admission date” from the person’s next recorded inpatient admission. Thirty-day readmission has been identified as a quality of care indicator that reflects coordination of care between inpatient and outpatient services, and whether patients are being discharged too early.<sup>87</sup> Research has shown that multiple readmissions can have negative consequences on adolescents, including increased self-harm behaviours, and may lead to disruption in their day-to-day lives.<sup>88,89</sup> We hypothesized that adolescents admitted to adult inpatient psychiatric units will have a greater likelihood of being readmitted within 30-days.

Length of stay was calculated by subtracting “admission date” from “discharge date.” Length of stay has also been used as an indicator of interest for inpatient psychiatric admissions, partly due to the direct relation to a main source of health systems costs and trying to predict the costs that are likely to incur.<sup>28,90</sup> Some factors that have been linked to longer length of stay include older age, male sex, longer duration of illness, and a diagnosis of schizophrenia, personality disorder, intellectual disability, or eating disorders.<sup>28,91</sup> We hypothesized that length of stay will be shorter for adolescents admitted to adult inpatient psychiatric units, as clinical staff and family members may aim for the briefest possible stay required to achieve therapeutic aims.

The binary variable “discharged against medical advice” was created using the “Discharge Disposition” and “Mental Health:AWOL” variables in the DAD dataset, and “X90” in the OMHRS dataset, which provides the most accurate reason for the person’s discharge. In the DAD dataset, if “Discharge Disposition” was recorded as ‘6-Signed out (against medical advice)’ or if “Mental Health: AWOL” was coded as ‘1-AWOL’, they were coded as a discharged against medical advice. In the OMHRS dataset, if X90 was coded as ‘5-AWOL’ or ‘7-Discharged against medical advice’ then they were coded as “discharged against medical advice”. Bardach and colleagues (2014) compared child and adolescent admissions for mental disorders to admissions for other reasons. They found that there was an increased likelihood for children and adolescents with mental disorders

to be discharged against medical advice than those without a diagnosis of a mental disorder. A review of the literature on adults with mental disorders has found that younger, unmarried people, with comorbid disorders and a history of numerous hospitalizations are more likely to be discharged against medical advice.<sup>92</sup> However, to our knowledge, discharge against medical advice has not been explored as an outcome measure in the context of adolescent admissions on adult psychiatric units. Nevertheless, we hypothesize that parents may be more likely to remove their child when admitted to an adult unit due to the many concerns with care (i.e. concern over safety and having their child around many unwell adults).<sup>88,89</sup>

## 3.7 Data Analysis

All data analyses were conducted using SAS® software version 9.4.

### 3.7.1 Objective 1

The proportion of adolescents with an inpatient psychiatric hospitalization in an adult psychiatric unit was calculated, with precision quantified using 2-sided 95% confidence intervals obtained using the score method.<sup>93</sup> Proportions were calculated for the following scenarios:

1. All first inpatient psychiatric admissions
2. All inpatient psychiatric admissions
3. Inpatient psychiatric admissions by year
4. Inpatient psychiatric admissions by age at admission

### 3.7.2 Objective 2

Proportions for each of the patient or institutional level variables outlined Section 3.5 were computed for both comparison groups. We used unadjusted modified Poisson regression models<sup>94</sup> to estimate the effect of each patient- and institutional-level variable

on the likelihood admission to an adult psychiatric unit. This was followed by a fully adjusted model to estimate the independent effects of each variable on admission. The strength of association between each independent variable and the outcome was quantified using a prevalence ratio and associated 2-sided 95% confidence interval.

### 3.7.3 Objective 3

Modified Poisson regression<sup>94</sup> was used to model the effect of unit of admission on 30-day readmission and discharge against medical advice. This approach combines the robust variance estimator and a log-link function instead of a logit link function in the generalized linear models framework. This approach is preferable to a logistic regression model, which yields an odds ratio that cannot reliably approximate the relative risk when the prevalence of the outcome is greater than 10%.<sup>95</sup> Additionally, the modified Poisson regression method uses a robust variance estimation that does not overestimate the standard error.<sup>94</sup> The relative risk for each variable and associated 95% confidence intervals were estimated. A negative binomial regression was used to model the impact of adult psychiatric unit admission on length of stay. Relative risk and associated 95% confidence intervals were estimated for each variable. We estimated both unadjusted and fully adjusted models for each outcome variable.

## Chapter 4: Results

### 4 Chapter Overview

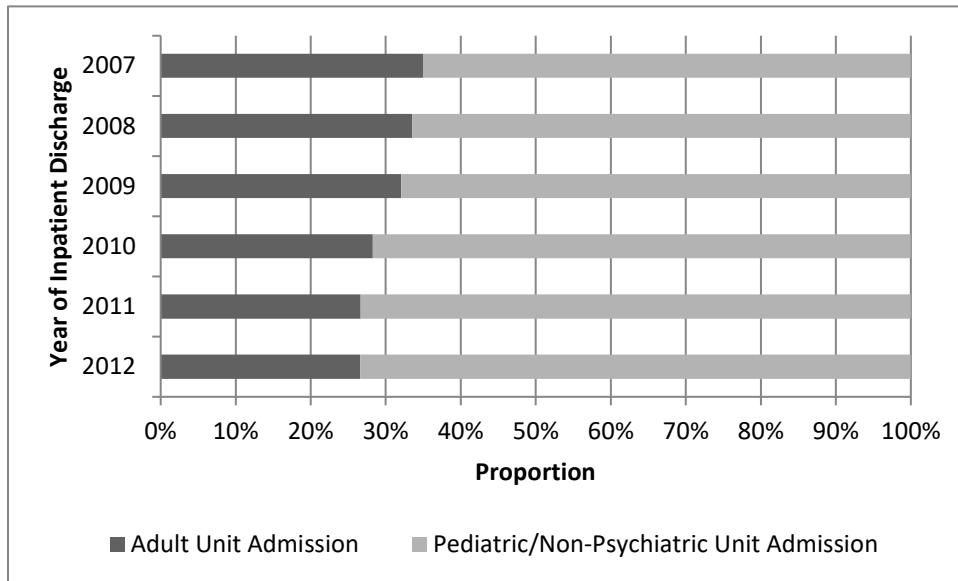
This chapter details the study findings, beginning with the proportion of admissions that occur on an adult psychiatric unit and a description of the sample. This is followed by the findings on factors associated with adult psychiatric admissions and an analysis of the outcomes related to admission on an adult psychiatric inpatient unit.

#### 4.1 Proportion of Admissions on an Adult Psychiatric Unit

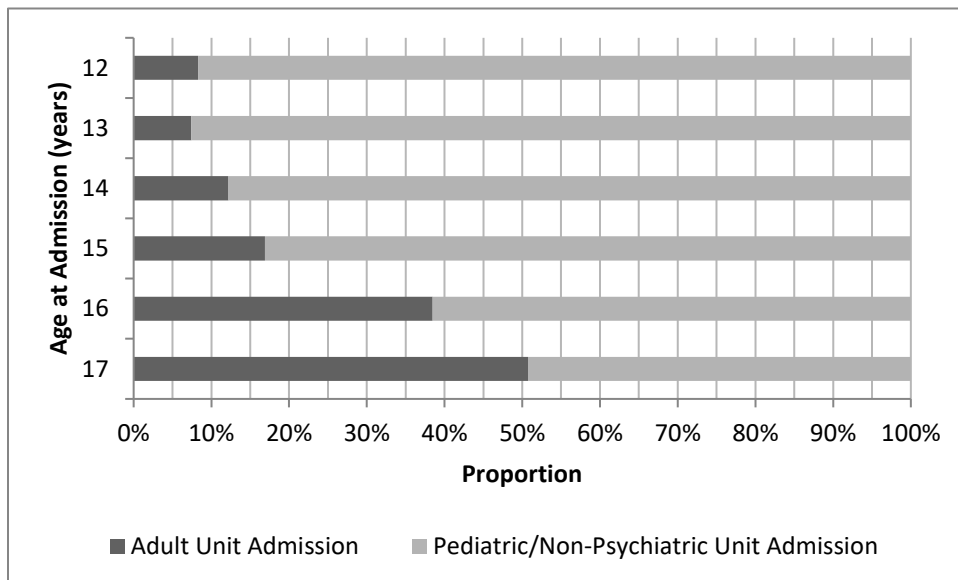
Our first objective was to estimate the proportion of adolescent inpatient psychiatric hospitalizations that occur in an adult psychiatric unit in Ontario. There were 28,688 inpatient psychiatric hospitalizations between the years 2007 and 2012 for adolescents between the ages of 12 and 17 years. Of these admissions 8,694 (30.3%) occurred in an adult psychiatric unit (95% CI: 29.8% to 30.8%). Over this same period, there were 16,718 first adolescent inpatient admissions in Ontario. Of these admissions 3,652 (22.8%) occurred in an adult psychiatric unit (95% CI: 21.2% to 22.5%).

When looking at inpatient psychiatric hospitalizations by year, the proportion of admissions that occurred on an adult psychiatric unit declined over the six-year period from 35.0% (95% CI = 33.5% to 36.5%) in 2007 to 26.6% (95% CI = 24.7% to 28.6%) in 2012 (See Figure 4.1). When examining the proportions by age at admission, the proportion of admissions that occurred on an adult psychiatric unit was 8.3% (95% CI = 6.9% to 9.9%) for adolescents who were aged 12, and increased by year up to 50.7% (95% CI = 49.7% to 51.8%) for adolescents who were aged 17 (See Figure 4.2).

**Figure 4-1: Proportion of Inpatient Psychiatric Admission on an Adult Psychiatric Unit by Year of Inpatient Discharge**



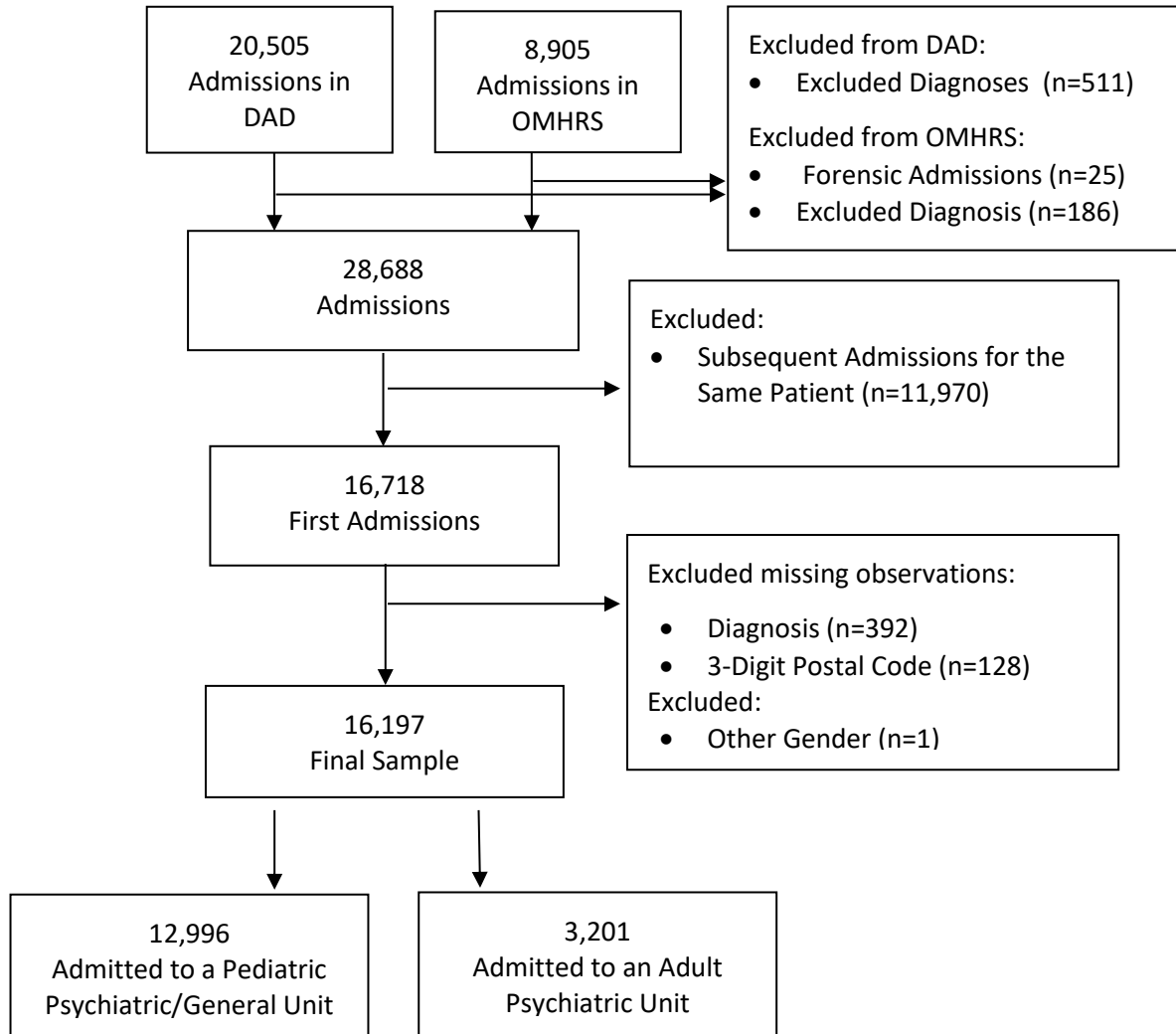
**Figure 4-2: Proportion of Inpatient Psychiatric Admissions on an Adult Psychiatric Unit by Adolescent Age at Admission**



## 4.2 Study Sample

A flow-chart showing the derivation of the sample is presented in Figure 4.3, and the demographic characteristics of the study sample are presented in Table 4.1.

**Figure 4-3: Sample Selection Flow Chart**



**Table 4-1: Sample Proportions for First Admissions**

Categories	All Admissions (n=16,197)		Admissions on a Pediatric/Non- psychiatric Unit (n=12,996)		Admissions on an Adult Unit (n=3,201)	
	Frequency	Percent (%)	Frequency	Percent (%)	Frequency	Percent (%)
<b>Age</b>						
12	990	6.1	944	7.3	46	1.4
13	1,547	9.6	1,483	11.4	64	2.0
14	2,504	15.5	2,334	18.0	170	5.3
15	3,547	21.9	3,174	24.4	373	11.7
16	3,836	23.7	2,763	21.3	1,073	33.5
17	3,773	23.3	2,298	17.7	1,475	46.0
<b>Gender</b>						
Male	6,589	40.7	5,073	39.0	1,516	47.4
Female	9,608	59.3	7,923	61.0	1,685	52.6
<b>Type of Residence</b>						
Urban	13,556	83.7	11,091	85.3	2,465	77.0
Rural	2,641	16.3	1,905	14.7	736	23.0
<b>Diagnosis</b>						
Substance-Related Disorders	1,312	8.1	791	6.1	521	16.2
Non-Affective Psychotic Disorders	898	5.5	547	4.2	351	11.0
Mood/Affective Disorders	6,066	37.5	4,646	35.8	1,420	44.4
Anxiety & Adjustment Disorders	4,336	26.8	3,689	28.4	647	20.2
Selected Disorders of Adult Personality & Behaviour	573	3.5	465	3.6	108	3.4
Pervasive & Specific Developmental Disorders	331	2.0	312	2.4	19	0.6
Behavioural & Emotional Disorders with Onset Usually Occurring in Childhood & Adolescence	2,100	13.0	1,998	15.4	102	3.2
Eating Disorders	581	3.6	548	4.2	33	1.0
<b>Hospital Type</b>						
General Hospital	15,111	93.3	12,082	93.0	3,029	94.6
Psychiatric Hospital	1,086	6.7	914	7.0	172	5.4

### 4.3 Factors Associated with Admission to an Adult Psychiatric Unit

The second objective of our study was to examine the patient-level and institutional-level factors that are associated with adolescent admission to an adult inpatient psychiatric unit. The proportions for each factor by comparison group and the results of the regression models are shown in Table 4.2.

Compared with 15-year-olds, 16-year-olds were more than twice as likely (PR = 2.41, 95% CI = 2.17 to 2.69), and 17-year-olds were more than three times more likely (PR = 3.21, 95% CI = 2.89 to 3.56) to be admitted to an adult psychiatric unit, after adjusting for these factors. Adolescents between the ages of 12 and 14 years were at a lower risk of being admitted to an adult psychiatric unit (Age 12: PR = 0.58, 95% CI = 0.43 to 0.77; Age 13: PR = 0.46, 95% CI = 0.35 to 0.59, Age 14: PR = 0.70, 95% CI = 0.59 to 0.83). Males were 13% more likely than females to be admitted to an adult psychiatric unit (PR = 1.13, 95% CI = 1.06 to 1.20). Adolescents who lived in a rural area were 45% more likely than those who lived in an urban area to be admitted to an adult psychiatric unit (PR = 1.45, 95% CI = 1.36 to 1.54). When compared with adolescents with mood/affective disorders, those with a substance-related disorder were 42% more likely to be admitted to an adult psychiatric unit (PR = 1.42, 95% CI = 1.31 to 1.54), and those with non-affective psychotic disorders were 36% more likely to be admitted to an adult psychiatric unit (PR = 1.36, 95% CI = 1.24 to 1.49). The remaining diagnostic categories were associated with a lower prevalence of admission to an adult psychiatric unit, relative to adolescents with anxiety and adjustment disorders, with PRs ranging from 0.82 (95% CI = 0.69 to 0.97) for selected disorders of adult personality and behavior, to 0.32 for eating disorders (95% CI = 0.27 to 0.39). Admission to a psychiatric hospital was a protective factor for admission to an adult psychiatric unit in unadjusted analyses (PR = 0.79, 95% CI = 0.69 to 0.91), but was no longer statistically significant in the fully adjusted model that accounted for patient characteristics.



**Table 4-2: Factors Associated with First Admission on an Adult Psychiatric Unit**

	Pediatric/ Non-Psych Unit Frequency (Proportion)	Adult Unit Frequency (Proportion)	Unadjusted Prevalence Ratio (95% CI)	Adjusted Prevalence Ratio (95% CI)
<b>Individual Level-Factors</b>				
Age 12	944 (7.3)	46 (1.4)	0.44 (0.33 to 0.60)*	0.58 (0.43 to 0.77)*
Age 13	1483 (11.4)	64 (2.0)	0.39 (0.30 to 0.51)*	0.46 (0.35 to 0.59)*
Age 14	2334 (17.9)	170 (5.3)	0.65 (0.54 to 0.77)*	0.70 (0.59 to 0.83)*
Age 15	3174 (24.4)	373 (11.7)	Reference	Reference
Age 16	2763 (21.3)	1073 (33.5)	2.66 (2.39 to 2.97)*	2.41 (2.17 to 2.69)*
Age 17	2298 (17.7)	1475 (46.1)	3.72 (3.35 to 4.12)*	3.21 (2.89 to 3.56)*
Female Gender	7923 (61.0)	1685 (52.6)	Reference	Reference
Male Gender	5073 (39.0)	1516 (47.4)	1.31 (1.23 to 1.40)*	1.13 (1.06 to 1.20)*
Urban Residence	11091 (85.3)	2465 (77.0)	Reference	Reference
Rural Residence	1905 (14.7)	736 (23.0)	1.53 (1.43 to 1.65)*	1.45 (1.36 to 1.54)*
Mood/Affective Disorder Diagnosis	4,646 (35.7)	1,420 (44.3)	Reference	Reference
Substance-Related Disorders Diagnosis	791 (6.1)	521 (16.3)	1.70 (1.56 to 1.84)*	1.42 (1.31 to 1.54)*
Non-Affective Psychotic Disorders	3,689 (28.4)	647 (20.2)	1.67 (1.52 to 1.83)*	1.36 (1.24 to 1.49)*
Anxiety & Adjustment Disorder Diagnosis	547 (4.2)	351 (11.0)	0.64 (0.59 to 0.69)*	0.72 (0.66 to 0.78)*
Selected Disorders of Adult Personality & Behavior Diagnosis	465 (3.6)	108 (3.4)	0.81 (0.68 to 0.96)*	0.82 (0.69 to 0.97)*
Pervasive & Specific Developmental Disorders Diagnosis	312 (2.4)	19 (0.6)	0.25 (0.16 to 0.38)*	0.33 (0.22 to 0.51)*
Behavioural & Emotional Disorders with Onset Usually Occurring in Childhood & Adolescence Diagnosis	1,998 (15.4)	102 (3.2)	0.21 (0.17 to 0.25)*	0.32 (0.27 to 0.39)*
Eating Disorder Diagnosis	548 (4.2)	33 (1.0)	0.24 (0.17 to 0.34)*	0.32 (0.23 to 0.45)*
<b>Institutional-Level Factors</b>				
General Hospital	12082 (93.0)	3029 (94.6)	Reference	Reference
Psychiatric Hospital	914 (7.0)	172 (5.4)	0.79 (0.69 to 0.91)*	1.02 (0.91 to 1.15)

\* Indicates statistically significant finding at  $p < 0.05$

## 4.4 Adult Admission & Hospitalization Outcomes

The third objective of this study was to compare 30-day readmissions, discharge against medical advice, and length of stay for adolescents who are admitted to an adult psychiatric unit, relative to youth who are admitted to a pediatric or non-psychiatric unit. Unadjusted and adjusted risk ratios for the analysis are shown in Table 4.3 – 4.5. The proportion of adolescents who were readmitted within 30-days was 6.9%. There was no significant association between admission to an adult psychiatric unit and risk of 30-day readmission. The average length of stay for adolescents was 10.5 days (standard deviation = 24.8) and the median length of stay was 6 days (IQR = 3 to 12). Adolescents who were admitted to an adult psychiatric unit had a shorter length of stay than those who were admitted to a pediatric or non-psychiatric unit (RR = 0.88, 95% CI = 0.82 to 0.95). The proportion of adolescents who were discharged against medical advice was 2.5%. When compared to adolescents admitted to a pediatric or non-psychiatric unit, those who were admitted to an adult psychiatric unit were 59% more likely to be discharged against medical advice (RR = 1.59, 95% CI = 1.28 to 1.97).

**Table 4-3: 30-Day Readmission after First Inpatient Psychiatric Admission**

	Unadjusted Relative Risk (95% CI)	Adjusted Relative Risk (95% CI)
Admitted to a Pediatric/Non-psychiatric Unit	Reference	Reference
Admitted to an Adult Unit	0.95 (0.82 to 1.09)	0.93 (0.80 to 1.09)
<b>Individual Level-Factors</b>		
Age 12	1.02 (0.80 to 1.30)	1.12 (0.87 to 1.43)
Age 13	1.00 (0.81 to 1.23)	1.04 (0.85 to 1.29)
Age 14	0.94 (0.78 to 1.13)	0.97 (0.81 to 1.16)
Age 15	Reference	Reference
Age 16	0.92 (0.78 to 1.09)	0.90 (0.76 to 1.06)
Age 17	0.81 (0.69 to 0.96)*	0.78 (0.66 to 0.94)*
Female Gender	Reference	Reference
Male Gender	0.88 (0.78 to 0.99)*	0.85 (0.76 to 0.97)*
Urban Residence	Reference	Reference
Rural Residence	0.98 (0.84 to 1.15)	0.98 (0.84 to 1.14)
Mood/Affective Disorders Diagnosis	Reference	Reference
Substance-Related Disorders Diagnosis	0.80 (0.64 to 1.00)	0.86 (0.69 to 1.08)
Non-Affective Psychotic Disorders	1.36 (1.11 to 1.67)*	1.50 (1.22 to 1.85)*
Anxiety & Adjustment Disorders Diagnosis	0.60 (0.52 to 0.71)*	0.59 (0.51 to 0.69)*
Selected Disorders of Adult Personality & Behavior Diagnosis	1.01 (0.76 to 1.35)	0.99 (0.74 to 1.32)
Pervasive & Specific Developmental Disorders Diagnosis	1.05 (0.73 to 1.51)	1.07 (0.74 to 1.55)
Behavioural & Emotional Disorders With Onset Usually Occurring in Childhood & Adolescence Diagnosis	0.73 (0.61 to 0.89)*	0.72 (0.59 to 0.88)*
Eating Disorder Diagnosis	0.68 (0.48 to 0.96)*	0.62 (0.43 to 0.88)*
<b>Institutional Level Factors</b>		
General Hospital	Reference	Reference
Psychiatric Hospital	0.77 (0.60 to 1.00)	0.78 (0.61 to 1.01)

\*p-value&lt;0.05

**Table 4-4: Length of Stay during First Inpatient Admission**

	Unadjusted Relative Risk (95% CI)	Adjusted Relative Risk (95% CI)
Admitted to a Pediatric/Non-psychiatric Unit	Reference	Reference
Admitted to an Adult Unit	0.96 (0.81 to 1.13)	0.88 (0.82 to 0.95)*
<b>Individual Level-Factors</b>		
Age 12	1.12 (1.02 to 1.22)*	1.08 (1.01 to 1.16)*
Age 13	1.12 (1.04 to 1.21)*	1.07 (1.01 to 1.13)*
Age 14	1.06 (0.99 to 1.14)	1.04 (0.99 to 1.10)
Age 15	Reference	Reference
Age 16	1.09 (0.98 to 1.21)	1.07 (1.01 to 1.14)*
Age 17	1.07 (0.96 to 1.20)	1.04 (0.98 to 1.10)
Female Gender	Reference	Reference
Male Gender	0.97 (0.89 to 1.06)	1.07 (1.02 to 1.12)*
Urban Residence	Reference	Reference
Rural Residence	0.98 (0.85 to 1.13)	0.98 (0.90 to 1.06)
Mood/Affective Disorders Diagnosis	Reference	Reference
Substance-Related Disorders Diagnosis	0.70 (0.65 to 0.76)*	0.70 (0.65 to 0.75)*
Non-Affective Psychotic Disorders	2.29 (1.84 to 2.84)*	2.14 (1.75 to 2.61)*
Anxiety & Adjustment Disorders Diagnosis	0.80 (0.76 to 0.84)*	0.78 (0.74 to 0.81)*
Selected Disorders of Adult Personality & Behavior Diagnosis	2.37 (1.76 to 3.18)*	2.27 (1.82 to 2.82)*
Pervasive & Specific Developmental Disorders Diagnosis	1.56 (1.30 to 1.88)*	1.39 (1.16 to 1.66)*
Behavioural & Emotional Disorders With Onset Usually Occurring in Childhood & Adolescence Diagnosis	0.97 (0.92 to 1.02)	0.88 (0.83 to 0.93)*
Eating Disorder Diagnosis	4.36 (4.08 to 4.65)*	4.33 (4.04 to 4.64)*
<b>Institutional Level Factors</b>		
General Hospital	Reference	Reference
Psychiatric Hospital	1.78 (1.42 to 2.25)*	1.71 (1.46 to 1.99)*

\*p-value&lt;0.05

**Table 4-5: Discharged Against Medical Advice during First Hospitalization**

	Unadjusted Relative Risk (95% CI)	Adjusted Relative Risk (95% CI)
Admitted to a Pediatric/Non-psychiatric Unit	Reference	Reference
Admitted to an Adult Unit	2.25 (1.84 to 2.74)*	1.59 (1.28 to 1.97)*
<b>Individual Level-Factors</b>		
Age 12	0.48 (0.23 to 1.00)	0.47 (0.22 to 1.00)
Age 13	0.42 (0.22 to 0.80)*	0.43 (0.23 to 0.82)*
Age 14	0.80 (0.53 to 1.22)	0.81 (0.53 to 1.24)
Age 15	Reference	Reference
Age 16	2.10 (1.55 to 2.83)*	1.91 (1.41 to 2.58)*
Age 17	2.52 (1.88 to 3.38)*	2.17 (1.60 to 2.93)*
Female Gender	Reference	Reference
Male Gender	1.26 (1.04 to 1.53)*	1.17 (0.95 to 1.43)
Urban Residence	Reference	Reference
Rural Residence	1.04 (0.80 to 1.34)	0.94 (0.73 to 1.22)
Mood/Affective Disorders Diagnosis	2.06 (1.53 to 2.77)*	1.66 (1.23 to 2.26)*
Substance-Related Disorders Diagnosis	0.90 (0.55 to 1.47)	0.71 (0.43 to 1.16)
Non-Affective Psychotic Disorders	Reference	Reference
Anxiety & Adjustment Disorders Diagnosis	1.14 (0.89 to 1.46)	1.31 (1.02 to 1.69)*
Selected Disorders of Adult Personality & Behavior Diagnosis	2.51 (1.72 to 3.65)*	2.64 (1.82 to 3.83)*
Pervasive & Specific Developmental Disorders Diagnosis	0.54 (0.20 to 1.46)	0.79 (0.30 to 2.15)
Behavioural & Emotional Disorders With Onset Usually Occurring in Childhood & Adolescence Diagnosis	0.88 (0.62 to 1.24)	1.42 (0.98 to 2.05)
Eating Disorder Diagnosis	0.77 (0.41 to 1.46)	1.12 (0.59 to 2.14)
<b>Institutional Level Factors</b>		
General Hospital	Reference	Reference
Psychiatric Hospital	0.64 (0.40 to 1.02)	0.71 (0.44 to 1.14)

\* p-value&lt;0.05

## Chapter 5: Discussion

### 5 Chapter Overview

This chapter provides a discussion of the key study findings and conclusions. Section 5.1 summarizes the results, and section 5.2 provides a summary of policy considerations. Additional sections provide a description of study strengths (Section 5.3), weaknesses (Section 5.4), and considerations for future research (Section 5.5).

#### 5.1 Key Study Findings

The dataset used in this study contains a cohort of 16,718 adolescents between the ages of 12 and 17 years with a first inpatient psychiatric admission in Ontario between April 1, 2007 and March 31, 2012. Of these admissions, 22.8% were to an adult psychiatric unit. This proportion is somewhat lower than what has been previously reported in the literature – estimates from Ireland and England suggest that up to 45% of adolescent admissions may be to an adult psychiatric unit.<sup>66,74</sup>

When examining first-time admissions to a psychiatric unit in the dataset, 22.8% of adolescents' first admission occurred in an adult psychiatric unit. This is particularly concerning given that barriers to help-seeking and disengagement from services is often shaped by adolescents' previous experiences within the mental health system.<sup>96</sup> Adolescents, parents, and staff all report concerns with admitting youth to adult psychiatric units, including fear for safety, increased stress, isolation, lack of involvement in care, and lack of age appropriate resources.<sup>7,25,26,66,69</sup> With already low service engagement from adolescents and young adults, having a negative experience during the first admission could lead to further avoidance of mental health services in the future.<sup>12,26,27</sup>

When examining the data by age group, the proportion of 16 and 17 year olds who were admitted to an adult unit was much higher than those under the age of 16 (38.5% and 50.7%, respectively). However, the proportion of adolescents under the age of 16 who

were admitted to an adult psychiatric unit is particularly noteworthy, ranging from 8.3% for 12 year-olds, to 16.9% for 15 year-olds. It could be argued that adolescents age 16 and 17 who are approaching the age cutoff (18 years) and may be more appropriately admitted to an adult unit; however, it is concerning to see that adolescents as young as 12 and 13 years are admitted to an adult unit. The Ontario Network of Child & Adolescent Inpatient Psychiatry's standard for child and adolescent inpatient mental health recommends that adolescents should not receive care from adult psychiatric units, and that their care should be developmentally appropriate, including an opportunity to continue their education and engage in age appropriate activities.<sup>22</sup>

Our study also found that older adolescents, males, people living in a rural area, and those with substance-related disorder or psychotic disorders were more likely to be admitted to an adult psychiatric unit. We had anticipated that older adolescents would be more likely to have an admission to an adult unit, as they are reaching the cutoff age and may seek autonomy or already be assuming adult roles (i.e. not in school).<sup>21,22</sup> If an adolescent lives in a rural environment, there may not be access to a pediatric psychiatric unit as hospitals tend to be smaller, and therefore admission to an adult unit may be the only option.<sup>23,71</sup> Although it may be possible for youth to be sent to a larger institution with a pediatric psychiatric unit, there is debate whether the benefit of a pediatric unit outweighs the risks of separating adolescents from their home and local support systems.<sup>71</sup> The onset of schizophrenia and other psychotic disorders tends to occur in the latter period of adolescence, which could explain why adolescents with this diagnosis tend to be admitted to adult psychiatric units.<sup>54,55</sup>

To our knowledge, this is the first study to compare clinical outcomes between adolescents admitted to adult psychiatric units and those admitted to pediatric psychiatric or non-psychiatric units. This study found no significant association between admission to an adult psychiatric unit and the risk of 30-day readmission. We had hypothesized that there would be an increased likelihood for those admitted to an adult psychiatric unit to be readmitted within 30-days, as this outcome measure has been identified as quality of care indicator that reflects coordination of care and appropriate discharge timing.<sup>87</sup> This finding could suggest that adolescents who were admitted to adult psychiatric units

received the level of care they needed, or it could suggest that adolescents avoided the hospital after a negative experience. This study found that older adolescents (age 17) had a decreased likelihood of 30-day readmission. This is inconsistent with the literature that reports older youth are at a higher risk for readmission.<sup>28,87,97</sup> We also found that males had a decreased likelihood of admission however, the literature on gender differences in readmission rates has been inconsistent.<sup>87,97</sup>

We also found that adolescents admitted to an adult psychiatric unit were more likely to be discharged against medical advice than those admitted to a pediatric/non-psychiatric unit, which was consistent with our hypothesis. We anticipated this finding, given that prior qualitative research clearly depicts the fear that adolescents and their families feel when a young person is admitted to an adult unit. This fear could lead the patient or their families to question whether the admission is doing more harm than good, which may lead a parent to remove their child from the unit, or adolescents to remove themselves. Older adolescents (age 16 and 17) were more likely to be discharged against medical advice, which may be due to adolescents' belief that they should be able to handle their problems and symptoms themselves, and stigma related with seeking psychiatric treatment.<sup>13,14</sup> We found adolescents with a diagnosis of mood/affective disorders, anxiety and adjustment disorders, and selected disorders of adult personality were more likely to be discharged against medical advice than those with a non-affective psychotic disorder. A literature review found that diagnoses of a personality disorder also resulted in a higher likelihood of discharge against medical advice for adults with mental disorders.<sup>92</sup> Lastly, we found that adolescents admitted to an adult psychiatric unit had a shorter length of stay than those admitted to a pediatric or non-psychiatric unit. This finding was consistent with our hypothesis and may be related to the increased likelihood of adolescents being discharged against medical advice. We found that younger adolescents (age 12 to 13) had a longer length of stay, which was not consistent with findings from Stewart and colleagues that length of stay increased with each year of increased age.<sup>28</sup> Our findings for diagnostic categories were consistent with previous research.<sup>28,62</sup>



Although it could be argued that the health system is saving money if adolescents admitted to adult units have a shorter length of stay, with no impact on 30-day readmission rates, there are still many negative factors associated with this practice. For example, we found that this practice increased the likelihood of discharge against medical advice, which has been shown to double the risk of death within 30-days and leads to an overuse of emergency rooms.<sup>92,98</sup> Additionally, the literature clearly depicts a clear picture of fear an adolescent may feel when they are admitted to an adult inpatient unit and these negative experiences may lead to delay in receiving the care they need in a timely manner.<sup>29,70</sup> Another factor to consider is developmentally appropriate care, when youth are admitted to an adult unit they are unlikely to receive developmentally appropriate care such as educational services to assist in school re-entry or involving families in treatment.<sup>7,22,26,73</sup>

## 5.2 Policy Considerations

Given the substantial proportion of youth admitted to adult psychiatric units, the association of adult admission with negative outcomes, and the negative experiences reported by adolescents, their parents, and mental health practitioners, what could be done from a policy perspective to address this issue? There are three options that could be explored in Ontario: 1) increasing community mental health supports; 2) implementing adolescent psychiatric units; or 3) adopting policies to prohibit adolescent admission to adult psychiatric units, similar to that of other jurisdictions.

Inpatient psychiatric services are meant to be used for diagnostic clarification or in times of crisis, suicidality, and other severe symptom impairment.<sup>22,61</sup> Over a ten year period (between 2007 and 2016), both emergency department usage and inpatient care increased for children and adolescents with mental disorders.<sup>18,19</sup> One reason that adolescents may be placed in adult psychiatric units is the lack of capacity among pediatric psychiatric units and in the inpatient mental health system generally.<sup>23,71</sup> Children's Mental Health Ontario has suggested the way to address the demand placed on the inpatient setting is to invest in community-based mental health services.<sup>99</sup> There are currently wait-times

between 35 and 98 days, depending on the type of service in the community mental health sector.<sup>100</sup> Adding resources to community mental health services would be an upstream solution – providing additional supports in the community would allow for more adolescents to be treated in a timely and clinically appropriate setting, thereby reducing unnecessary demand on hospital care for mental disorders.<sup>99</sup>

Another suggestion to improve inpatient psychiatric care for adolescents is to implement adolescent psychiatric units. Viner (2007) conducted a survey with 16,707 adolescents age 12 to 17 years who had received inpatient psychiatric care between 2003 and 2004 in England to explore their perceptions of quality of care. Adolescents who were admitted to an adolescent psychiatric unit reported significantly better of quality of care, including “confidentiality, communication, information-giving, partnership, and respect”, compared with adolescents who were admitted to a child or adult psychiatric unit.<sup>101</sup> Youth continually report the preference for an adolescent specific unit that fits their educational needs and provides age-appropriate service that respects their autonomy and privacy, and allows them to be around peers of a similar age.<sup>26,101–103</sup> However, there is a lack of data related to the impact an admission to an adolescent-specific unit has compared to admission to a child or adult unit, and this is unlikely to be a feasible option for many smaller community-based hospitals.

Lastly, Canada could adopt policies that address the admission of children and adolescents to adult inpatient units. Both the United Kingdom and Scotland have taken steps to prohibit the admission of those under the age of 18 to adult inpatient units.<sup>20,21</sup> Although there is legislation in place to prevent admissions to an adult inpatient unit, there is still the overriding need and atypical need criteria where such an admission can happen.<sup>21</sup> Therefore, it is yet to be proven if the legislation is effective in preventing appropriate admissions.

### 5.3 Future Research

Although policy options have been explored in other jurisdictions, there is still much to be done in terms of further research. In order to do this, improvement in data collection is needed across the mental health system. Some important aspects to consider include the

use of cross-sectoral data, using key patient identifiers to link data across community and hospital mental health care, as well as using one common system for admission and discharge reporting – for example, the Resident Assessment Instrument-Mental Health used in the OMHRS database should be used for both pediatric and adult admissions. Improved measurement of mental health care has been identified as a priority area for both the Canadian Institute for Health Information and the Mental Health Commission of Canada.<sup>35,36</sup>

Additionally, further research is needed to determine the extent to which admissions to an adult psychiatric unit impact on adolescent clinical outcomes. Pediatric psychiatric units are starting to report to the OMHRS database (previously limited to adult admissions), which will allow for more extensive examination of this issue. Very few studies have focused on adolescent admission to adult psychiatric units, and to date none have used both qualitative and quantitative data to provide a comprehensive picture of the issue. It may be advantageous to conduct a mixed methods study that would link clinical outcomes with patient reported outcomes and clinical evaluation of the appropriateness of admission. Gathering data from all sources would help provide a complete picture of the adolescent experience during an admission to an adult psychiatric unit, and the impact of this practice on outcomes.

## 5.4 Strengths

Determining the frequency of adolescent admission to adult psychiatric units in Ontario and the associated factors helps to fill a critical gap in the literature on inpatient mental health services for adolescents, and is an important first step in addressing this issue. There is currently a paucity of literature on adolescent admission to adult inpatient psychiatric units, particularly quantitative data. To our knowledge, this will be the only Canadian study to examine the factors associated with and outcomes of admission to an adult psychiatric unit, compared to pediatric or non-psychiatric units. Additionally, it is the first study to compare outcomes between adolescents admitted to an adult inpatient psychiatric unit and those admitted to a pediatric psychiatric unit or non-psychiatric unit.

This study used a large administrative database, which provided a large sample size that captured all adolescent admissions over a five-year period. Additionally, there were minimal missing data for the variables of interest.

Transition-aged youth are highlighted as a strategic target group provincially<sup>6</sup> and nationally,<sup>75</sup> and the results from this study can be used to inform decision making on resource allocation and providing appropriate access to mental health care for adolescents in Ontario.

## 5.5 Limitations

There are a number of limitations that should be considered. Based on the available data, we were unable to determine the exact unit that adolescents in our comparison group were admitted to – specifically, whether the adolescent was admitted to a pediatric psychiatric unit or received services in a pediatric or adult non-psychiatric bed. This limits our interpretation of the estimates and our ability to identify the most suitable setting for adolescent psychiatric admission. There is also the possibility that we may have misclassified some admissions as we could only identify the first admission during our study period (April 1, 2007 to March 31, 2012) not necessarily the adolescent's first psychiatric admission ever. Additionally, we cannot account for adolescents experiencing multiple admissions prior to the study period or before the age of 12. Youth could experience multiple escalating admissions that could result in admission to an adult psychiatric unit.

The two datasets we accessed (DAD and OMHRS) use different diagnostic classification systems (ICD-10 and DSM-IV, respectively). Multiple studies have determined that these diagnostic coding systems have important differences, including required symptoms, exclusion criteria, and diagnostic definitions, which make it difficult to draw direct comparisons.<sup>84-86</sup> A study conducted by Andrews, Slade, & Peters found that the concordance between ICD-10 and DSM-IV diagnoses was 68%, with the lowest concordance being 33% for substance harmful use or abuse, and the highest concordance being 87% for dysthymia.<sup>84</sup> As a result, we had to use broad categories to describe adolescent diagnoses. Additionally, due to the nature of health administrative data, we are

unable to examine the severity of symptoms which could be an important factor in determining whether an adolescent is admitted to a child or adult psychiatric inpatient unit.

Additionally, some variables are not available across the two datasets, which limited comparability of all potential confounders that may impact the outcomes. We only included variables that are available in both datasets which means that we are missing factors that may influence our findings, such as self-injury. We were also missing important information at the facility level, such as facility type and location. Due to privacy concerns, we were not able to obtain full postal codes for adolescents or hospitals, which would give us a proxy measure for neighbourhood-level SES and the distance from a hospital, which are both potential explanatory factors. For instance, a person who lives close to a hospital with a pediatric psychiatric unit might be more likely to have an admission at that hospital due to the distance from their home than someone who lives 200km from the closest pediatric unit.

It is also important to acknowledge that we only have inpatient admission data available, which is only one small part of the mental health system. Adolescents who are well supported in the community and those who successfully transition to the community after discharge may have better outcomes.

Due to the nature of the study, we are unable to determine if an adolescent's admission was 'appropriate.' The literature has cited reasons why an adult admission may be appropriate, including living an adult lifestyle, potential for aggressive behaviour, proximity to support network, and if the stay is very brief.<sup>21-23,71</sup> We were unable to account for these factors in our data.

Additionally, it is important to note that we found a declining trend in admission of adolescents to adult psychiatric units over the study period therefore; it may have declined even further in the following years.

## 5.6 Conclusions

Although the topic of adolescent admission to adult inpatient psychiatric units is understudied, it is evident that it can have a profound impact on an adolescent's life and subsequent engagement with psychiatric treatment. This study aimed to determine the prevalence, determinants, and outcomes related to the hospitalization of youth aged 12 to 17 years on adult inpatient psychiatric units in Ontario. This study found that approximately one in three adolescents is admitted to an adult inpatient unit. Our analyses suggest that older adolescents, males, those living in rural areas, and those with substance-related disorder or non-affective psychotic disorders were more likely to be admitted to an adult psychiatric unit. Additionally, admission to an adult psychiatric unit had an impact on an adolescent's length of stay and the likelihood they were discharged against medical advice. Several policy considerations and improvements to data collection were explored in the discussion that could improve access to appropriate care for adolescents in Ontario.

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## Appendices

### Appendix A: Excluded Diagnoses

DSM-IV Diagnosis		
Diagnostic Code	Diagnosis	Sample Size
2900	Dementia of the Alzheimers type with late onset Uncomplicated	1
2948	Dementia NOS or Amnestic Disorder NOS	1
30011	Conversion Disorder	7
3007	Hypochondriasis or Body Dysmorphic Disorder	2
30082	Somatoform Disorder NOS, Undifferentiated Somatoform Disorder	2
3009	Unspecified Mental Disorder (nonpsychotic)	7
3022	Pedophilia	1
30270	Sexual Dysfunction NOS	2
30780	Pain Disorder Associated With Psychological Factors	1
317	Mild Mental Retardation	5
319	Mental Retardation, Severity Unspecified	19
V1581	Noncompliance With Treatment	1
V6120	Parent-Child Relational Problem	10
V6289	Phase of Life Problem, Religious or Spiritual Problem or	2

	Borderline Intellectual Functioning	
V652	Malingering	2
V7101	Adult Antisocial Behavior	1
V7102	Child or Adolescent Antisocial Behavior	6
V7109	No Diagnosis or Condition on Axis I or Axis II	18
<b>ICD-10 Diagnosis</b>		
<b>Diagnostic Code</b>	<b>Diagnosis</b>	<b>Sample Size</b>
F050	Delirium not superimposed on dementia, so described	2
F058	Other delirium	2
F059	Delirium, unspecified	15
F060	Organic hallucinosis	1
F063	Organic mood [affective] disorders	5
F067	Mild cognitive disorder	1
F068	Other specified mental disorders due to brain damage and dysfunction and to physical disease	4
F069	Unspecified mental disorder due to brain damage and dysfunction and to physical disease	3
F072	Postconcussional syndrome	27
F078	Other organic personality and behavioural disorders due to brain disease, damage and dysfunction	1

F079	Unspecified organic personality and behavioural disorder due to brain disease, damage and dysfunction	1
F09	Unspecified organic or symptomatic mental disorder	4
F440	Dissociative amnesia	1
F442	Dissociative stupor	1
F444	Dissociative motor disorders	2
F445	Dissociative convulsions	77
F446	Dissociative anaesthesia and sensory loss	2
F448	Other dissociative [conversion] disorders	6
F449	Dissociative [conversion] disorder, unspecified	108
F450	Somatization disorder	6
F452	Hypochondriacal disorder	3
F453	Somatoform autonomic dysfunction	2
F454	Persistent somatoform pain disorder	11
F458	Other somatoform disorders	8
F459	Somatoform disorder, unspecified	6
F481	Depersonalization-derealization syndrome	1
F510	Nonorganic insomnia	1
F512	Nonorganic disorder of the sleep-wake schedule	1

F513	Sleepwalking [somnambulism]	1
F515	Nightmares	1
F519	Nonorganic sleep disorder, unspecified	2
F531	Severe mental and behavioural disorders associated with the puerperium, not elsewhere classified	1
F54	Psychological and behavioural factors associated with disorders or diseases classified elsewhere	22
F59	Unspecified behavioural syndromes associated with physiological disturbances and physical factors	1
F642	Gender identity disorder of childhood	1
F649	Gender identity disorder, unspecified	4
F659	Disorder of sexual preference, unspecified	1
F700	Mild mental retardation With the statement of no, or minimal, impairment of behaviour	3
F701	Mild mental retardation with significant impairment of behaviour requiring attention or treatment	10
F708	Mild mental retardation with Other impairments of behaviour	2
F709	Mild mental retardation with without mention of impairment of behaviour	14
F711	Moderate mental retardation with significant impairment of behaviour requiring attention or treatment	5

F718	Moderate mental retardation with Other impairments of behaviour	2
F719	Moderate mental retardation Without mention of impairment of behaviour	6
F721	Severe mental retardation with significant impairment of behaviour requiring attention or treatment	2
F729	Severe mental retardation Without mention of impairment of behaviour	1
F731	Profound mental retardation with Significant impairment of behaviour requiring attention or treatment	1
F739	Profound mental retardation Without mention of impairment of behaviour	2
F781	Other mental retardation with significant impairment of behaviour requiring attention or treatment	1
F799	Unspecified mental retardation Without mention of impairment of behaviour	13
F99	Mental disorder, not otherwise specified	10



## Curriculum Vitae

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