University of Alberta

Patient and treatment characteristics of children and youth who visit the emergency department for a behavioural disorder

by

Stacy Liu

A thesis submitted to the Faculty of Graduate Studies and Research
in partial fulfillment of the requirements for the degree of

Master of Science

Medical Sciences – Pediatrics

Fall 2013
Edmonton, Alberta

ABSTRACT

More and more parents are seeking care for their children in emergency departments (EDs) to stabilize acute emergencies related to mental health problems, request guidance for at-home child management, and gain access to health care resources. This retrospective cohort study explored patient and treatment characteristics of 325 children and youth (<18 years) who made 365 ED visits for a behavioural disorder between January 1, 2009 and December 31, 2011. Results reflect trends observed by other research studies including gender and age trends for diagnosis, pre-existing involvement in the health system, and ED visits deemed urgent in nature. This research adds a unique perspective of the reasons children/youth visited the ED and the type of emergency care they received for a behavioural disorder. The most common precipitating event to the ED was a suicide-related gesture/attempt. The majority of children/youth had mood and suicidality assessments, which reflected precipitating events and presenting complaints.

ACKNOWLEDGEMENTS

As a once lost graduate student, I am grateful for my supervisor, Dr. Mandi Newton, to have, without hesitation, picked me up and walked along with me on this journey. Her warm acceptance and extensive research and clinical knowledge has resonated with me each step of the way. Her continuous cheerleading for me and *all* students simply cannot be measured or put into words. Ultimately, it was her hunger to conduct rigorous research with real world implications for health care that motivated me to achieve excellence.

I am also grateful to my committee members, Drs. Samina Ali and Rhonda Rosychuk, who, with open out-stretched arms, helped make this journey accomplishable and fun. Their supportive directions, expertise, and eagerness to help and care made a significant impact with my thesis project and the journey.

I also owe much of my success to the Department of Pediatrics and am indebted to my graduate chairs, Drs. Po-Yin Cheung and Sujata Persad. They have been tremendous supporters since the beginning of my journey. How lucky I am to have had not one, but two great advocates!

To my family and friends who have encouraged me daily, thank you for never questioning why I am doing what I'm doing and believing in me. To my husband, Maple, who has supported me throughout all my endeavours, and who holds me to who I am and ought to be, thank you for being there for me every day. Last, but never least, I want to thank God. Without His grace and strength, I certainly could not have accomplished this alone.

TABLE OF CONTENTS

APPENDICES **Page**

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS

ADHD	attention deficit hyperactivity disorder
CT	Computed Tomography (scan)
CTAS	Canadian Triage and Acuity Scale
DA	dissemination area
DSM-IV	Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition
ED	emergency department
EEG	Electroencephalography
FASD	fetal alcohol spectrum disorder
FSA	forward sortation area
ICD-10, CA	International Classification of Diseases and Related Health Problems Canadian version
IQ	intelligence quotient
IQR	interquartile range
MRI	Magnetic Resonance Imaging
SD	standard deviation
SES	socioeconomic status
SPSS	Statistical Product and Service Solutions
US	United States of America

Chapter One: Introduction

Epidemiology

Most psychiatric disorders diagnosed in children and youth are externalizing child behaviour problems such as conduct disorder and attention deficit hyperactivity disorder (ADHD) (Dempster *et al.*, 2011). Merikangas and colleagues have proposed the prevalence of behavioural disorders to be higher than the most frequent major physical conditions diagnosed in childhood including asthma and diabetes (Merikangas *et al*., 2010). Among boys and girls with a behavioural disorder, 50% are diagnosed by age 11 (Merikangas *et al.*, 2010) with the incidence of diagnosis increasing as boys and girls move from childhood to adolescence (Searight *et al.*, 2001).

The prevalence of behavioural disorders in the general population is difficult to accurately determine due to several challenges including variation in diagnostic approaches, screening tools, and diagnosticians (Taggart *et al.*, 2010). However, it has been approximated that 20% of American youth, aged 13-18, have a behavioural disorder (Merikangas *et al.*, 2010). In general, more boys than girls are diagnosed with a behavioural disorder while more girls are diagnosed with anxiety and mood disorders (Merikangas *et al.*, 2010; Murray & Farrington, 2010; Zwirs *et al*., 2007). The prevalence of conduct disorders in adolescents is estimated to range from 6-16% in boys and 2-9% in girls (North America; Murray & Farrington, 2010), while the prevalence of ADHD is estimated to be 13% in boys and 4.2% in girls (Merikangas *et al.*, 2010). Some researchers suggest that gender differences in diagnoses exist because boys are more likely to demonstrate

physical aggression and other externalizing behaviours (e.g., impulsiveness) compared to girls who exhibit more relational aggression (e.g., spreading rumors) and internalizing behaviours such as inattentiveness and anxiety (Zahn-Waxler *et al.*, 2008b; Miller *et al.*, 2010). Specifically for ADHD, girls typically show different phenotypes (more inattentive versus hyperactive) compared to boys (Biederman *et al.*, 2012; Monuteaux *et al.*, 2007). Others argue the gender differences may arise depending on stage of development (different response levels to environmental stressors) and methodological differences in studies (Tung *et al*., 2012). Elkins and colleagues suggest that more research with samples of more females is needed to adequately support gender difference hypotheses (Elkins *et al.*, 2011). Further investigation is also important for identifying racial/ethnic differences as there as few reported differences in behavioural disorders as well (Merikangas *et al.*, 2010).

Characteristics of Behavioural Disorders

The behavioural disorders described here will include disorders with onset usually occurring in childhood and adolescence as classified by the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV) (American Psychiatric Association, 1994), namely hyperkinetic disorders (F90.x), conduct disorders (F91.x), and mixed disorders of conduct and emotions (F92.x) (Table 1.0, Appendix III, page 102). According to the DSM-IV, hyperkinetic disorders such as ADHD are primarily characterized by an extreme lack of persistence in activities that require cognitive involvement. Conduct disorders are primarily characterized by dissocial, aggressive, or defiant conduct that is repetitive and

persistent for at least six months or longer. Under the umbrella of conduct disorders, oppositional defiant disorder is a disorder that is usually diagnosed in younger children with significant defiant, disobedient, and disruptive behaviour exclusive of dissocial and aggressive behaviours. Mixed disorders of conduct and emotions, as the diagnostic group suggests, is a combination of conduct disorder characteristics (dissocial, aggressive or defiant behaviours) and depression, anxiety or other emotional characteristics.

Table 1.0 Diagnostic features of behavioural disorders

Hyperkinetic disorders	Hyperactivity; behaviour disinhibition; inattention and distractibility; lack of persistence in activities that require cognitive involvement, a tendency to move from one activity to another without completing any one, often reckless and impulsive, prone to accidents; impairment of cognitive functions is common, and specific delays in motor and language development are disproportionately frequent.
Conduct disorders	Persistent pattern of violating others' rights; aggression and illegal acts; repetitive and persistent pattern of dissocial, aggressive, or defiant conduct; excessive levels of fighting or bullying, cruelty to other people or animals, severe destructiveness to property, fire-setting, stealing, repeated lying, truancy from school and running away from home, unusually frequent and severe temper tantrums, and/or disobedience.
Mixed disorders of conduct and emotions	Combination of persistently aggressive, dissocial or defiant behaviour with overt and marked symptoms of depression, anxiety or other emotional upsets.

(American Psychiatric Association, 1994; Searight *et al*., 2001).

Although each behavioural disorder has distinguishing features, children and youth diagnosed with different behavioural disorders share common features. These characteristics include impulsiveness, aggressive outbursts, limited self-

regulation, and disinhibition (Searight *et al.*, 2001). Children with ADHD can be impulsive and reckless; thus, they can get in trouble with the law due to their violation of rules unlike children with a conduct disorder who may be disciplined because of a deliberate act of defiance (Pardini & Fite, 2010).

Co-morbidity rates among behavioural disorders are high (Pardini & Fite, 2010; Srebnicki *et al.*, 2012; Murray & Farrington, 2010; Barkley *et al.*, 1990; Elkin *et al.*, 2011; Bussing *et al.*, 2003). Applying the DSM-IV criteria to a sample of over 1,500 boys in one community, 63.6% of children were diagnosed with conduct disorder and ADHD, 48.9% with oppositional defiant disorder and ADHD, and 68.2% with oppositional defiant disorder and conduct disorder (Pardini & Fite, 2010). There are also common problems that children and youth with behavioural disorders typically struggle with. Socially, children and youth with behavioural disorders are less popular amongst peers and have fewer positive friendships (Elkins *et al*., 2011; Manuzza *et al.*, 2000). It has also been reported that children/youth, particularly girls, with ADHD are more likely to be bullied or teased at school (Elkins *et al.*, 2011). Academically, children/youth with behavioural disorders experience more problems with learning, have less academic motivation, and receive lower grades (Elkins *et al.*, 2011; Mannuzza *et al.*, 2000; Pardini & Fite, 2010). In a large French Canadian population (Galera *et al.*, 2009), researchers concluded that children with ADHD and conduct disorder were 1.6 times to 2.7 times more likely to repeat a school grade and two times more likely to not graduate from secondary school, after adjusting for age, gender, environmental risk factors (socioeconomic status, parental psychopathology,

parental martial status), psychopathy comorbidity, and previous school difficulties. Reasons for repeating a grade or failure to graduate (such as executive functioning/intelligence quotient (IQ) levels, presence of a learning disability, and days missed school) were not explored. There are also higher rates of depression, suicide attempts, and anxiety among youth with behavioural disorders (Zahn-Waxler *et al.*, 2008a). Children and youth with behavioural disorders are also more likely to engage in risky behaviours such as substance abuse (Farone *et al.*, 2007; Torok *et al.*, 2012; Elkins *et al.*, 2007) and involvement with the law (Pardini & Fite, 2010).

Co-morbidity for behavioural disorders with certain medical conditions such as Tourette syndrome (Ghanizadeh & Mosallaei, 2009) and fetal alcohol spectrum disorder (FASD) (O'Malley & Nanson, 2002) are also high. Children with Tourette syndrome and behavioural disorders also exhibit higher social and attention problems and aggression compared to children with only behavioural disorders (Ghanizadel & Mosallaei, 2009). In one study, 94% of children with FASD were diagnosed with ADHD (Peadon & Elliott, 2010); however, the authors advocated for more studies to examine the relationship between ADHD and FASD to improve diagnosis.

Diagnostic stability rates are high among behavioural disorders (Pardini & Fite, 2010; Srebnicki *et al.*, 2011; Murray & Farrington, 2010; Biederman *et al.*, 2012). In one study, almost half (45%) of children, aged 4 to 12, diagnosed with conduct disorder were diagnosed four years later compared to only 5% of children without a previous diagnosis (Murray & Farrington, 2010). In another study, over

half (56%) of children diagnosed with ADHD also met diagnostic criteria for the disorder six to seven years later (Srebnicki *et al.*, 2011). The continuity of behavioural disorders from childhood or adolescence to adulthood adds to a lifetime burden of illness making early diagnosis and continuity of care important.

Conduct disorder has been reported to predict theft, criminal activity, and violence while oppositional defiant disorder has predicted ongoing involvement with the juvenile justice system, and ADHD has predicted low academic achievement (Pardini & Fite, 2010). Recently, Knapp *et al.* (2011) examined behavioural problems in childhood and outcomes in adulthood across economic outcomes. They concluded that there was a relationship between adverse adulthood outcomes (e.g., being unemployed, lower earnings) and behavioural and emotional problems in childhood. While acknowledging that more long-term outcome studies are still required, Knapp and colleagues recommended interventions are needed to more effectively prevent and treat behavioural disorders during childhood.

Children and youth diagnosed with behavioural disorders share common external situations. Children from a lower socioeconomic status (SES) have been reported to be at higher risk for behavioural problems (Schonberg & Shaw, 2007; Van Oort *et al.*, 2011). In a large, national representative sample of Canadian children aged 4 to 11 years, the top three predictors of behavioural problem were family SES, lone-parent family status, and the percentage of lone-parent families in same neighbourhoods (Boyle & Lipman, 2002). Boe and colleagues (2011) reported a significant association between average and poor family economy and

higher levels of conduct behaviours. Although children with behavioural disorders have been generally associated with high-risk behaviours (e.g., substance abuse, delinquency) (Farone *et al.*, 2007; Torok *et al.*, 2012; Elkins *et al.*, 2007; Pardini & Fite, 2010), many studies linking high-risk behaviours with SES do not report the prevalence of behavioural disorders within their samples (Vazonyi & Chen, 2010; Tobler *et al.*, 2011). Children/youth in foster care are reported to generally have more behavioural problems (Woods *et al.*, 2012; Persi & Sisson, 2008). As high as 50% to 60% of children entering foster care will exhibit behavioural and/or emotional disorders (Landsverk *et al.*, 2009). It has been reported that twice as many children in foster homes have ADHD compared to children who are not in foster care (Duric *et al.*, 2011), and that the risk for ADHD is four times greater if the child's family is in need of social support (e.g., welfare; Duric *et al.*, 2011).

Health Care Needs of Children and Youth with Behavioural Disorders

Behavioural disorders share common, and usually multifaceted, interventions for treatment. Behavioural problems become more resistant to treatment over time (Webster-Stratton & Reid, 2003). Intervention is most effective when targeted towards both the parents and child/youth as underlying family issues and dysfunctions relative to the behavioural problem are common (Searight *et al.*, 2001).

Broadly, interventions can be grouped into psychosocial treatment and pharmacotherapy. Psychosocial treatment includes behaviour management training and cognitive-based training (French & Kisicki, 2011). Behaviour

management training focuses on parenting behaviours. Parents are taught how to promote behavioural change through clear communication, reinforce their child/youth's positive behaviours, and maintain clear and consistent rules to help their child/youth manage his/her behaviours and emotions (Searight *et al.*, 2001; French & Kisicki, 2011). Cognitive-based training focuses on the child/youth. Children and youth are taught how to understand and regulate their emotions and behaviours though perspective taking and social interactions (French & Kisicki, 2011). Pharmacotherapy includes various medications to target specific behavioural symptoms such as improving attention and increasing inhibitory activity, and is usually considered as an adjunct treatment (Searight *et al.*, 2001). Medication is often prescribed for behavioural disorders. ADHD and conduct disorders are the most common diagnoses linked to antipsychotic medication use in Canada (Alessi-Severini *et al.*, 2012). French and colleagues (2011) have challenged physicians to consider pharmacotherapy only after psychosocial treatment has been attempted for a sufficient length of time (several months) and should never be used as sole intervention.

The increased trend for prescribing stimulant medications for behavioural disorders documented in Canada and the United States (US), while beyond the scope of this thesis, has raised concerns and questions about prescribing rates and over/under diagnosis (Alessi-Severine *et al.*, 2012; Zuvekas & Vitiello, 2012; Brault & Lacourse, 2012). In Canada, a study by Brault and collegues (2012) reported that approximately 40% of children who received medication for ADHD did not have a diagnosis. An American study reported that 57% of children in the

study who received medication for ADHD also did not meet the diagnostic criteria for the disorder (Angold *et al.*, 2000).

Only 25% of children with psychiatric disorders access mental health treatment (Waddell *et al.*, 2007). A number of factors affecting mental health care utilization have been reported in the literature. Some studies suggest that parental discipline efficacy (parents' perceptions of discipline and difficulties they are experiencing), parental knowledge of behavioural problems, and a parent's ability to cope with environmental stressors, including their child's behaviours, are key factors to accessing to care (Harrison *et al.*, 2004; Sayal *et al.*, 2010). Another study proposes that parents may believe that their child's behavioural problems are not due to a mental health condition and feel it is not necessary to take their child to see a physician (Sayal *et al.*, 2010). Parental concerns of consequences after seeking help have emerged as another reason for parents not accessing care (Sayal *et al.*, 2010; Copeland & Syner, 2011). These concerns include their child will be taken away from them, of the stigma attached to mental health disorders, and being viewed as a 'bad parent' if they seek help for their child's problems (Sayal *et al.*, 2010; Copeland & Syner, 2011).

Literature suggests there is a lack of mental health services and early intervention programs available to children and youth (Waddell *et al.*, 2007; Reid & Brown, 2008; Eggerston, 2005). A movement towards early intervention is an ongoing public health priority (Waddell *et al.*, 2007). A study in Ontario reported key challenges to delivering services by children's mental health agencies included limited program funding, long wait-lists (e.g., high demand for services,

but decreased resources to provide services), increased case complexity, and poor service integration and coordination (Reid & Brown, 2008). Some suggest that primary health care providers (family physicians and pediatricians) are well positioned to identify and children with behavioural problems early on (Dempster *et al.*, 2012). The most common childhood behavioural problem presenting to pediatricians and family physicians is ADHD (Rushton *et al.*, 2004). However, in a study conducted by Dempster and colleagues (2012), it was reported that fewer than 2% of children with a diagnosable mental health disorder were referred for mental health care in any given year. Further, very few pediatricians (2.3%) and family physicians (1.6%) have behavioural/mental health training (Rushton *et al.*, 2004), which raises the question of the role of such health care providers in early identification and intervention efforts.

Emergency Department Utilization for Mental Health Crises

Without specialized mental health care such as behavioural management, the behaviours of children/youth with behavioural disorders may escalate, and families may find themselves in need of crisis intervention to stabilize their child's behaviours and emotions and improve family functioning. An increasing trend in pediatric mental health emergency department (ED) visits has been reported in North America. Studies have shown that more and more parents are seeking care for their children in EDs to stabilize acute emergencies related to mental health problems (Newton *et al.*, 2009; Reder & Quan, 2004; Grupp-Phelan *et al.*, 2009; Kennedy *et al.*, 2009), request guidance for at-home child management (Cloutier *et al.*, 2010), and gain access to health care resources

(Cloutier *et al.*, 2010). Studies in the US have reported that visits for pediatric mental health emergencies increased from 43.3-77.0 to 61-93 per 10,000 US population between 1992 and 2001 (Larkin *et al.*, 2005; Sills & Bland, 2002). In the largest Canadian study to date, Newton *et al.* (2009) found that the number of ED visits for pediatric mental health emergencies increased 15% from 2002 to 2006 in Alberta.

Different studies report different characteristics of children and youth who visit the ED for mental health crises, including diagnoses and gender differences. Differences in characteristics may reflect geographic disparities, trends in diagnosis, health care system differences (e.g., insurance status, universal access), and population differences. In Newton *et al.*'s study (2009), the top three diagnoses given to Albertan's children and youth (aged 0-17 years) for mental health visits to the ED were anxiety/stress-related disorders, mental/behavioural disorders due to substance abuse, and mood disorders. An American study identified unspecified disturbance of conduct, depressive disorders, and unspecific neurotic disorders as the top three diagnoses given to children and youth (aged 10 to 19 years) for mental health visits to the ED (Mahajan *et al.*, 2009). Reported gender differences in ED mental health visits have also varied. In 2002, Sills and Bland reported a 50/50 distribution of visits by American boys and girls, while Newton *et al.* (2011a) reported that more girls than boys visited the ED for mental health emergencies particularly for youth aged 15-17 years in Alberta.

Many different resources can be involved in pediatric emergency mental health care. Several studies that have defined resources as hospital admissions,

use of consultative services, and length of stay have classified pediatric mental health presentations to the ED as 'resource intensive'. To highlight, admission rates are reported to be high for children who visit the ED for a mental health crisis. In Alberta, from 2002 to 2008, 14% of mental health visits to the ED resulted in hospital admission (Newton *et al.*, 2011b). American studies have reported higher admission statistics (as high as 52% of mental health ED visits) (Grupp-Phelan *et al.*, 2009; Christodulu *et al.*, 2002; Mahajan *et al.*, 2009). Wassem *et al.* (2001) reported that three times more children (18.4%) with mental health visits to the ED were admitted to hospital compared to children (6.3%) with non-mental health visits. Being admitted to hospital is more likely to occur following a return visit to the ED for emergency mental health care (compared to children/youth with a single visit) (Newton *et al.*, 2009; Christodulu *et al.*, 2002). Depending on the study sample, multiple visits are more likely seen in older (aged 13 to 17 years), female patients diagnosed with mood disorders or psychotic-related illness, and children whose families receive social assistance (Newton *et al.*, 2010; Yu *et al.*, 2011) or in pediatric patients with diagnoses of conduct, adjustment, or oppositional defiant disorder and under the care of a children's social services (Christodulu *et al.*, 2002).

Use of consultative services for mental health care has been examined at five US pediatric EDs (Grupp-Phelan *et al.*, 2009). The study authors acknowledged that while available resources in other EDs may be different to the urban tertiary care hospitals in the study, 90% patients at the study sites received a mental health consultation. Indeed, having available in-house resources does play

a significant factor in consultative service use. A Canadian study that compared the differences in clinical management between two different resourced EDs and found that a psychiatric-resourced ED provided significantly more mental health consultations than a pediatric-resourced ED that did not have 'in-house' psychiatric services (Newton *et al.*, 2011a).

Mental health emergencies have also been reported to be resource intensive because children have a longer length of stay in the ED (Waseem *et al.*, 2011; Mahajan *et al.*, 2009; Christodulu *et al.*, 2002; Santiago *et al.*, 2006). Controlling for age and major and minor psychiatric diagnoses, the length of stay for pediatric patients with a mental health visit has been reported as almost five to seven times longer than pediatric patients with visits for non-mental health concerns (Waseem *et al.*, 2011). In the US, pediatric patients with mental health visits have spent a median time of 3.8 to 4.75 hours [interquartile range (IQR): 0.17-3.3 hours, 6.55-57 hours] in the ED (Grupp-Phelan *et al.*, 2004; Santiago *et al.*, 2006) while pediatric patients in Alberta with mental health presentations have spent a median time of 2 hours 58 minutes [IQR: 1 hours 27 minutes, 5 hours 25 minutes] in the ED (Newton *et al.*, 2011b). No studies have specifically examined reasons for longer ED stays for pediatric mental health visits, but reasons may include diagnostic complexity, laboratory work-ups, and non-treatment time such as waiting for psychiatric consultative services (Santagio *et al.*, 2006; Christodulu *et al.*, 2002; Mahajan *et al.*, 2009; Grupp-Phelan *et al.*, 2009).

Recently, Newton and colleagues (2011a) provided a different perspective of resource use during pediatric mental health ED visits by detailing the assessments, treatment, and discharge instructions received by children and youth at two hospitals, one that had in-house psychiatric resources and the other without. They concluded that both EDs lacked comprehensive care for pediatric mental health presentations and challenged the idea that pediatric mental health visits are as resource intensive as reported in the literature because significant gaps were identified in care such as clinically essential assessments and follow-up/discharge planning. Data specific to behavioural disorders were not published in this study.

Behavioural Disorders in the Emergency Department

Children and youth with behavioural problems can be agitated, aggressive, and experience severe emotional distress with co-morbid health conditions, making treatment difficult (Guevara *et al.*, 2007). In a crisis situation, behaviours and distress can be heightened. Further, the ED can be a fast-paced and busy setting, which does not necessarily promote an environment for de-stimulation or ample time to address the constellation of behavioural, emotional, social, and family needs that may underpin the crisis. A question not yet addressed in the literature is the type of care children and youth with behavioural disorders receive in the ED. The objectives of my Master's Thesis project were to describe patient and treatment characteristics of children and youth who visit the ED for an emergency related to their behavioural disorder. Specifically, I aimed to: (1) describe sociodemographic characteristics of children and youth and any

differences between children and youth treated for different behavioural disorders; (2) determine the common events leading up to the ED visit; (3) describe the urgency of visits to the ED; (4) describe treatments provided, assessments conducted, follow-up arrangements made, and the disposition status of visits; and (5) determine ED wait times for care.

I hypothesized that: (1) a) there would be more young children (10-12 years) with hyperkinetic disorders presenting to the ED compared to children with conduct disorders, b) the majority of patients would be male and live in low socioeconomic neighbourhoods, and c) children and youth with behavioural disorders living in foster or group homes would make up more of my study population with violence/aggression-related events as the most common precipitating event for this population; (2) the most common event leading up to the ED visits would be violence/aggression related; (3) the majority of ED visits would be defined as semi-urgent to non-urgent in nature; (4) a) the majority of children and youth would receive mental health assessments, but no treatment during their ED visit (e.g., psychosocial or pharmacological), and b) the majority of children and youth would be discharged from the ED with follow-up arrangements made for them to be seen in an out-patient mental health clinic; and (5) wait times for care would be more than one hour.

Chapter Two: Methods

Study Design and Population

This study was a retrospective cohort study that used medical record review methods. Records from January 1, 2009 to December 31, 2011 for consecutive pediatric behavioural mental health presentations to an urban, tertiary care emergency department (ED) that satisfied the inclusion criteria were reviewed. The ED was situated in the downtown core of Edmonton, Alberta, and housed resources for mental health crisis management including in-patient beds and psychiatric consultation. Care in the ED was provided by general emergency medicine trained physicians. During the three-year study period, the ED treated 4,842 pediatric patients, on average annually, with 18.6% of these visits related to mental health (Appendix I, page 99).

Study inclusion criteria were: (1) children and youth aged 10-17 years who attended the ED between January 1, 2009 to December 31, 2011, and (2) assigned a main ambulatory care diagnosis using the International Classification of Diseases and Related Health Problems Canadian version (ICD 10, CA) for behavioural disorders (ICD codes F90-F92). This study was approved by the Research Ethics Board at the University of Alberta.

Variables of Interest

Sociodemographic and health care visit characteristics from medical records were collected. Sociodemographic characteristics for each patient included birth date, age at ED visit, gender, current medications, medical co-morbidities, current medical and social services resources, and full six-digit postal

code. Health care visit characteristics collected for each ED visit included: dates of presentation and discharge, time registered in the ED, triage time, time seen by a health care provider (e.g., physician, nurse, consultative service), triage level (documented according to the Canadian Triage and Acuity Scale (CTAS; Howlett & Alkinson, 2011; Gravel *et al.*, 2012), main ambulatory care diagnosis (ICD-10, CA), mode of arrival, accompaniment, primary complaint, history of events, lab diagnostics and imaging, consultative services, clinical assessments and interventions, recommended follow-up plan, and discharge plan.

Medical Record Review Protocol

The study's protocol was based on published methodological guidelines for emergency medicine medical record reviews (Gearing *et al.*, 2006; Gilbert *et al.*, 1996). Gearing and colleagues propose nine steps for reviews beginning with developing research questions and hypotheses to determine study feasibility and to guide study approach (See Appendix IV, page 105, for a list of research objectives and hypotheses), and a 'clinical scan' to better understand the clinical flow, design of existing health records, and how data are being documented in the ED. My clinical scan involved a consultation with an ED physician (supervisory committee member) and shadowing the physician during a work shift to gain a better understanding of ED visits and medical records.

As per Gearing and colleagues (2006), the second step of nine steps involved conducting a literature review to develop an in-depth understanding of my topic; this review became the introduction chapter of my thesis. The third step involved developing my research proposal, which was submitted to, and approved

by, the Research Ethics Board at the University of Alberta. The fourth step involved developing a data abstraction instrument, which detailed how data were to be collected, managed, stored, and analyzed. I created an electronic data abstraction instrument (Appendix V, page 108), which was reviewed and revised by my supervisory committee. The fifth of nine steps according to Gearing *et al.* (2006) involved developing a protocol and guideline for data abstraction to ensure consistency and accuracy during data collection. I completed this step at a meeting with my supervisor. It was agreed that I would re-abstract 10% of the medical records three weeks following the initial abstraction. This three-week timeframe was chosen to minimize recall bias. I also planned to record data entry questions or issues in a study Log Book to discuss with my supervisor. Step six involved data abstraction including site and abstraction training. Although abstractors should remain blind to study hypotheses to minimize subjectivity in data abstraction, this was not possible given this was my graduate research project. My supervisor trained me in data abstraction at the hospital site. All data abstraction was conducted in the Health Records department at the ED's hospital. Medical records were retrieved by clerks working in the Health Records department.

Gearing *et al.* (2006) recommend step seven involve calculating statistical power to determine a study's needed sample size. To identify and determine the sample size for my study, I requested all consecutive medical records meeting study inclusion criteria during my study period. My supervisory committee and I decided that I would expand the study period if there were not enough medical

records that met the inclusion criteria. A list of all medical records satisfying my study's inclusion criteria was provided by Alberta Health Services' Data Management Team. This initial spreadsheet provided the number of charts according to year, and upon review, was determined adequate as a study sample with over 350 records for review. The ninth and final step involved a pilot study to assess study feasibility (e.g., is time frame to complete the study appropriate and achievable for a Master's Thesis project?), evaluate my abstraction instrument, and make methodological changes, if necessary. I completed the pilot study using the abstraction instrument and made necessary adjustments (e.g., I moved some variables on the instrument to coordinate with the flow of the medical record for easier abstraction).

Children/youth who had additional visits in their medical records that were not in the initial medical record retrieval were flagged. Final diagnoses of those visits were requested to ensure that they were not missed in the initial medical record sampling. None of the newly identified multiple visits had a main diagnosis of behavioural disorder and thus, did not meet my study's inclusion criteria.

Data Coding and Analysis

Patient and visit characteristics were analyzed for this study. The analysis of patient characteristics was performed based on data from the first ED visit during the study period. Children and youth with single and multiple visits were also compared. Children and youth with single visits were defined as those who visited the ED once for a behavioural problem during the study period. Children

and youth with multiple visits were defined as those who visited the ED for a behavioural problem during the study period more than once.

Six-digit postal code data were linked to Census Data Statistics Canada (2006) to determine median household annual income. The median household annual income was used as a proxy for socioeconomic status (SES) in my study. Six-digit postal code data were requested to determine Dissemination Area (DA) as the geographical area. A DA is the smallest area for which Canadian Census data are available; a DA typically has a population of 400 to 700 persons. Postal codes that were not listed in the Census data and thus, unavailable for median household income conversions, were reviewed again to ensure accuracy and subsequently coded as 'unavailable'.

'Missing' and 'unable to determine' data were determined using the following decision rules: (1) A 'missing' label was given to data from medical records that were not included in the medical record; (2) an 'unable to determine' label was assigned to data from medical records that were available, but that I was unable to determine if accurate. For example, if a name was documented for the physician the child/youth was under the care of, but there no mention of the physician's specialty, I coded this datum as 'unable to determine'. If a physician's name was not documented at all, this datum was coded as 'missing'. When treatment was provided by a health care provider, but no time was recorded, this datum was coded as 'unable to determine'. In other cases where treatment was not provided by a health care provider, and thus would not have a time recorded, this

datum was coded as ‘no treatment’. Not every child/youth saw all four health care providers and not all contact times were documented in the medical records.

The history of events leading to the ED visit was recorded verbatim from the child/youth’s medical record. For statistical analyses purposes, common themes were identified using key phrases and wording (Hsieh & Shannon, 2005; Elo & Kyngas, 2007). The frequency of the identified events was determined for the first ED visit for all children and youth and across social services resources and median household annual income.

Random checks of translation (10%) were made to ensure data from the abstraction template were correctly transferred for statistical analyses. For every data entry with two or more variables that did not seem to belong (e.g., accompanied with family, but arrived by police), data abstraction files were reviewed. If an accurate translation was determined, the medical record was re-reviewed to ensure the accuracy of data abstraction.

Data were analyzed using Statistical Product and Service Solutions (SPSS) software, Version 19. Frequency distributions are presented for categorical variables, and continuous variables are presented using univariable summaries (means, medians, interquartile ranges) with standard deviations (SDs). Age was treated as both a continuous variable and a categorical variable (aged 10-12 and 13-17 years). Distributions of medial household annual income and ED visit times were displayed graphically by percentages. Chi square and Fisher’s exact tests were conducted to describe patterns of distributions of behaviour disorders across demographics (age, gender, and median household annual income) and

psychiatric co-morbidity and medical resources across household annual income and social services, and compare children and youth with single and multiple ED visits. Evidence of statistical significance was reported at the 0.05 level.

Wait times, as continuous variables, are displayed in table and figure format using box and whisker plots. Kruskal-Wallis test, adjusted for multiple comparisons, was conducted to detect evidence of statistically significant differences in wait times for care among triage levels for each health care provider separately. Individual wait times of care were analyzed for health care providers separately using Kaplan-Meier survival curves.

Chapter Three: Results

Three hundred and seventy eight visits to the emergency department (ED) met the study's inclusion criteria. Medical records for these visits were requested; of these, 25 records were missing at initial review. A second request for the missing records was made eight weeks after the initial request. This request yielded 12 charts for review with 13 charts remaining missing and unavailable for study. In total, 365 medical records for ED visits made by 325 children and youth were reviewed. Of the records reviewed, there were 76 multiple visits; 291 children made one ED visit, 28 children made two ED visits, and six children made three visits within the study period.

Patient Characteristics

As seen in Table 3.0, the most common diagnosis for children and youth at their first ED visit was conduct disorder (n=209, 64.3%). The majority of children (n=246, 75.7%) were between the ages of 13 and 17 years at the time of their first ED visit; the average age was 13.96 years (SD: 2.069). More males (59%) presented for a behavioural problem at the first ED visit than females (41%).

Included in this study were four children with no fixed addresses, twelve with inactive postal codes that were not listed in the Census data, and four postal codes that were not found in the 2006 Census. The latter postal codes may be areas with poor data quality or did not have any dwellings with people. In total, postal code data for 20 children/youth were not available for the median household income analyses. The majority of children and youth (n=167, 51.4%)

came from families with an annual, median household income between $50,000 and $69,999. There were approximately three times more children and youth from families in the highest median income category (>$90,000) (n=31, 9.5%) than children and youth from families in the lowest median income category (<$30,000) (n=11, 3.4%).

Seven themes emerged from the history of events taken verbatim from the medical records and were recorded as events leading up to the ED visit. These events were: (1) suicidal gesture (threats) or suicide attempt, (2) violent/angry outburst (threats only), (3) violent behaviour, (4) depression/anxiety, (5) running away, (6) bizarre behaviour that was not aggression or depression related, and (7) prescription refill. Half of the children and youth in the study (n=155, 47.7%) visited the ED because of a suicidal gesture or suicide attempt. Events leading up to the first ED visit were also examined across household annual income (Table 3.1). A suicidal gesture or attempt was the most common event leading up to the ED across all median income categories; violent behaviours were the second most common event. Events leading up to the first ED visit were also investigated by studying social service involvement by two groups: (1) temporary care (group home or foster family), and (2) other (adopted home, biological family, or undocumented). Suicidal gestures/attempts were the most common reasons leading up to the ED visit in both groups (48.7% and 39.1%, respectively) (Table 3.1). Medical record documentation suggested that many problems reported by children/youth and families in the ED were chronic and symptoms of a larger problem. One registered nurse noted “parents are at the end of their rope” while

other registered nurses wrote, “behaviours are becoming too much for parents to handle” and “parents state they have no idea what else to do to help [patient].”

Table 3.0 Characteristics of children and youth at their first ED visit for a behavioural problem (n=325)

		n	(%)
Age group			
	10-12 years	79	(24.3)
	13-17 years	246	(75.7)
Gender			
	Male	192	(59.1)
	Female	133	(40.9)
Household Annual Income, median			
	<$30,000	11	(3.4)
	$30,000 - $49,999	45	(13.8)
	$50,000 - $69,999	167	(51.4)
	$70,000 - $89,999	51	(15.7)
	>$90,000	31	(9.5)
	Unavailable	20	(6.2)
ED diagnosis			
	Conduct Disorder	209	(64.3)
	Mixed Disorder of Conduct and Emotions	61	(18.8)
	Hyperkinetic Disorder	55	(16.9)
Event leading to ED visit[a]			
	Suicidal gesture or suicide attempt	155	(47.7)
	Violent/angry outburst (threats only)	83	(25.5)
	Violent behaviour	81	(24.9)
	Depression/anxiety	29	(8.9)
	Running away	20	(6.2)
	Bizarre behaviour	9	(2.8)
	Prescription refill	1	(0.3)

[a] Total >100%; 53 children/youth had multiple events

Table 3.1 Event leading to the first ED visit** by household annual income and social service involvement* (n, row %)

	Suicidal gesture/attempt	Violent/angry outburst	Violent behaviour	Depression/ anxiety	Running away	Bizarre behaviour
Household Annual Income, median (n=305)						
<$30,000	5 (41.7)	2 (16.7)	5 (41.7)	0 (0.0)	0 (0.0)	0 (0.0)
$30,000 - $49,999	27 (49.1)	13 (23.6)	10 (18.2)	1 (1.8)	2 (3.6)	2 (3.6)
$50,000 - $69,999	80 (41.5)	45 (23.3)	41 (21.2)	13 (6.7)	8 (4.1)	6 (3.1)
$70,000 - $89,999	28 (43.8)	9 (14.1)	10 (15.6)	10 (15.6)	6 (9.4)	1 (1.6)
>$90,000	11 (29.7)	9 (24.3)	10 (27.0)	4 (10.1)	3 (8.1)	0 (0.0)
Social service involvement (n=325)						
Temporary care[a]	37 (48.7)	10 (13.2)	17 (22.4)	5 (6.6)	5 (6.6)	2 (2.6)
Other[b]	118 (39.1)	74 (24.5)	64 (21.2)	24 (7.9)	15 (5.0)	7 (2.3)

* Some children/youth may have had more than one main event leading to the first ED visit

** A third event category, prescription refill, (n=1) is not displayed

[a] Group home or foster family

[b] Adopted home, biological family, or undocumented

An examination of demographic characteristics across the diagnosis given at the first ED visit (Table 3.2) revealed that when children/youth were divided into two age groups (10-12 years and 13-17 years), age differences were noted for the three studied behavioural disorders [χ^2_2=8.865, p=0.012]. Across the groups, hyperkinetic disorder was the more frequent diagnosis given to younger children (aged 10-12 years) while conduct disorder and mixed disorders of conduct and emotions were the more frequent diagnoses given to youth (aged 13-17 years). Gender differences were found between the diagnoses [χ^2_2 =7.611, p=0.022]. More males were diagnosed with hyperkinetic and conduct disorders compared to females, while more females were diagnosed with mixed disorders of conduct and emotions compared to males. There was no evidence of a statistically significant difference in the distribution of household annual income across the three diagnoses (Fisher's exact test=4.223, p=0.844).

The majority of children and youth who presented to the ED with a behavioural concern also had a co-morbid psychiatric disorder (n=193, 59.4%); attention deficit hyperactivity disorder (ADHD) and oppositional defiant disorder were the two most commonly diagnosed disorders (Table 3.3). A history of self-harm and substance abuse was also documented in 40% of children/youth's medical records at the first ED visit. A large number of children and youth (n=137, 42.2%) were under the care of a psychiatrist. Almost half (48.3%, n=157) of children and youth were taking psychiatric medications at the time of their first ED visit. Please see Appendix II (page 100) for a comprehensive list of the psychiatric and non-psychiatric medications documented in the reviewed medical

records. Seventy-five children and youth (23.1%) had either no documentation of having any medical resources or unclear documentation (e.g., a documented physician's name, but undetermined specialty).

Table 3.2 Distribution of demographic characteristics across behavioural disorder diagnosed at the first ED visit (n, column %)

	Hyperkinetic		Conduct		Mixed		p-value
Age group (n=325)							
10-12 years	21	(38.2)	49	(23.4)	9	(14.8)	0.012[a]
13-17 years	34	(61.8)	160	(76.6)	52	(85.2)	
Gender (n=325)							
Male	39	(70.1)	125	(59.8)	28	(45.9)	0.022[a]
Female	16	(29.1)	84	(40.2)	33	(54.1)	
Household Annual Income, median (n=305)							
<$30,000	3	(5.9)	5	(2.6)	1	(1.7)	0.844[b]
$30,000 - $49,999	10	(19.6)	52	(26.7)	18	(30.5)	
$50,000 - $69,999	17	(33.3)	61	(31.3)	15	(25.4)	
$70,000 - $89,999	12	(23.5)	44	(22.6)	13	(22.0)	
>$90,000	9	(17.6)	33	(16.9)	12	(20.3)	

[a] Pearson chi-square test
[b] Fisher's exact test

Table 3.3 Psychiatric co-morbidities documented at the first ED visit[a] (n=193)

	n	(%)
Attention Deficit Hyperactivity Disorder	130	(67.4)
Oppositional Defiant Disorder	66	(34.2)
Depression	43	(22.3)
Anxiety Disorder	18	(9.3)
Autism Spectrum Disorder	12	(6.2)
Post Traumatic Stress Disorder	10	(5.2)
Bipolar Disorder	9	(4.7)
Conduct Disorder	9	(4.7)
Schizophrenia	7	(3.6)
Reactive Attachment Disorder	6	(3.1)
Mood Disorder	5	(2.6)

[a]Total >100%; some children/youth had multiple co-morbidities

Table 3.4 provides a summary of the children/youth's medical histories and current medical resources at the time of the first ED visit. There was no documentation of current/past social service involvement for the majority of children and youth (n=222, 68.3%). Fifty-seven children and youth (17.5%) were living in group homes, 18 children and youth (5.5%) were living with their adopted families, and nine children and youth (2.8%) were living with a foster family at the time of the ED visit. Nineteen children and youth (5.8%) had documentation of previous involvement or an open file with Child and Family Services, or a previous history of group/foster home placement.

For those children and youth with multiple ED visits, the diagnosis remained the same for 41.2% (n=14) while a different behavioural disorder was diagnosed at the second ED visit for 58.9% of children and youth (n=20). As seen in Table 3.5, there was no evidence of a statistically significant difference in age, gender, household annual income, or frequency of ED diagnosis between children and youth with a single ED visit compared to children and youth with multiple ED visits. Among children and youth with a single ED visit, the most common event leading up to their ED visit was suicide-related (n=136, 46.9%). Among children and youth with multiple visits, there were two common events leading up to their ED visits: violent/angry outbursts (n=11, 32.4%) and suicide gestures/attempts (n=11, 32.4%). Of children and youth with multiple ED visits (n=34), 12 children and youth lived in a group home and two children changed statuses from living in a group home to living with family. The rest of the children and youth (n=20, 59%) were living with their families at all ED visits.

Table 3.4 Documented medical history and current resources at the first ED visit (n=325)

	n	(%)
Psychiatric medication use		
Yes	157	(48.3)
No	160	(49.2)
Unable to determine/Missing	8	(2.5)
Other medication use		
Yes	50	(15.4)
No	267	(82.2)
Unable to determine/Missing	8	(2.5)
Previously diagnosed psychiatric disorder		
Yes	193	(59.4)
No	129	(39.7)
Unable to determine/Missing	3	(0.9)
Other diagnosed health conditions[a]		
No past medical history documented	135	(41.5)
Medical co-morbidity	105	(32.3)
Fetal Alcohol Spectrum Disorder	25	(7.7)
Tourette's Syndrome	20	(6.1)
History of self-harm	63	(19.4)
History of substance abuse	62	(19.1)
Developmental delay	17	(5.2)
Language or speech delay	5	(1.5)
Congenital Disorder	5	(1.5)
Other	3	(0.9)
Unable to determine/Missing	4	(1.2)
Medical resource use		
Psychiatrist	137	(42.2)
Psychologist	40	(12.3)
Family physician/Pediatrician	30	(9.2)
Other	28	(8.6)
None stated by family	15	(4.6)
Unable to determine/Missing	75	(23.1)
Social service involvement		
None documented	222	(68.3)
Group home	57	(17.5)
Adopted home	18	(5.5)
Foster care	9	(2.8)
Other	19	(5.8)

[a] Total >100%; some children/youth had multiple conditions

Table 3.5 Differences in child characteristics for children and youth with a single ED visit (n=291) versus children and youth with multiple ED visits (n=34).

	Single visit n (%)	Multiple visit n (%)	p-value
Age group			
10-12 years	69 (23.7)	11 (32.4)	0.268[b]
13-17 years	222 (76.3)	23 (67.6)	
Gender			
Male	167 (57.4)	23 (67.6)	0.251[b]
Female	124 (42.6)	11 (32.4)	
Household Annual Income, median			
<$30,000	9 (3.2)	2 (4.5)	0.833[c]
$30,000 - $49,999	38 (13.5)	7 (15.9)	
$50,000 - $69,999	145 (51.6)	22 (0.5)	
$70,000 - $89,999	46 (16.4)	5 (11.4)	
>$90,000	27 (9.6)	4 (9.1)	
Unavailable	15 (5.3)	5 (11.4)	
ED diagnosis			
Conduct Disorder	186 (63.9)	25 (73.5)	0.622[c]
Mixed Disorder of Conduct and Emotions	55 (18.9)	5 (14.7)	
Hyperkinetic Disorder	50 (17.1)	4 (11.8)	
Event leading to visit[a]			
Suicidal gesture/attempt	136 (46.9)	11 (32.4)	—
Violent/angry outburst (threats only)	78 (26.8)	11 (32.4)	
Violent behaviour	70 (24.1)	10 (29.4)	
Depression/anxiety	27 (9.3)	3 (8.8)	
Running away	15 (5.2)	2 (5.9)	
Bizarre behaviour	9 (3.1)	1 (2.9)	
Prescription refill	1 (0.3)	0 (0.0)	

[a] Total >100%; some children/youth had multiple events
[b] Pearson chi-square test
[c] Fisher's exact test

Characteristics of Emergency Department Visits

As seen in Table 3.6, the majority of ED visits were triaged as Urgent (n=188, 51.5%) or Emergent (n=150, 41.1%). Most visits involved accompaniment by a family member (n=245, 67.1%) and were 'walk-ins' (n=174, 47.7%), meaning children and youth were ambulatory and came to the ED with a

family member. The most prevalent presenting complaints documented at triage were depression, suicidality, and/or intentional self-harm (n=164, 45.8%).

Table 3.6 ED visit characteristics (n=365)

	n	(%)
Triage (CTAS) level		
Resuscitation (Level 1)	0	(0.0)
Emergent (Level 2)	150	(41.1)
Urgent (Level 3)	188	(51.5)
Semi-Urgent (Level 4)	20	(5.5)
Non-Urgent (Level 5)	1	(0.3)
Missing	6	(1.6)
Mode of arrival		
Walk-In	174	(47.7)
Police	136	(37.3)
Emergency Medical Services (EMS)	55	(15.1)
Accompaniment		
Family member	245	(67.1)
Social Services	50	(13.7)
Police	40	(11.0)
Medical Personnel	21	(5.8)
Alone	6	(1.6)
Friend	2	(0.5)
Unclear	1	(0.3)
Presenting complaint		
Depression/suicidality/intentional self-harm	167	(45.8)
Violent/homicidal behaviour	105	(28.8)
Anxiety/situational crisis	29	(7.9)
Disruptive behaviour	28	(7.7)
Bizarre behaviour	20	(5.5)
Moderate anxiety/agitation with paranoia	1	(0.3)
Overdose	1	(0.3)
Other	14	(3.8)

Table 3.7 provides a summary of the treatment and care received during the ED visits. The majority of ED visits did not involve medical test ordering (n=301, 82.5%). In total, 59 laboratory requisitions were completed for 64 visits. The most common requisition requested was toxicology screening, followed by

electroencephalogram (EEG). Most ED visits had a documented physical examination (n=196, 53.7%), mood assessment (n=309, 84.7%) and/or suicidality assessment (n=295, 80.8%) in the medical record. Approximately one fifth of ED visits (n=80, 21.9%) involved crisis intervention including medication administration (e.g., physical and/or chemical restraint use); 34.5% of visits (n=126) involved brief family/individual counseling. Mental health consultations, either with a mental health crisis team or child psychiatrist, were requested for the majority of visits (73.4% and 60.3%, respectively) while consultation with social work was requested for 12.5% of visits (n=42). The majority of follow-up recommendations for children and youth with an ED visit for a behavioural disorder were to follow up with a primary health care provider (n=153, 41.9%) who included general practitioners, pediatricians, counselors, psychiatrists, or psychologists. Approximately 30% of visits (n=109) involved a recommendation to follow up with an out-patient psychiatry program while 13.7% of visits (n=50) involved a recommendation to follow up with the mental health crisis team affiliated with the ED. The majority of ED visits during the study period resulted in discharge to the family home (n=249, 68.2%). Only 20 ED visits (5.5%) resulted in admission to an in-patient psychiatry program for further care.

Table 3.7 Treatment and care received during the ED visit (n=365)

	n	(%)
Laboratory Testing and Imaging[a]		
None performed	301	(82.5)
Toxicology Screen	30	(8.2)
Electroencephalography (EEG)	11	(3.0)
Pregnancy Test or Sexual Transmitted Illnesses Test	6	(1.6)
Blood work	6	(1.6)
CT Scan/Ultrasound/MRI	6	(1.6)
Unable to determine/Missing	9	(2.4)
Assessment[a]		
Mood	309	(84.7)
Suicidality	295	(80.8)
Physical examination	196	(53.7)
Homicidality	144	(39.5)
None	1	(0.3)
Unable to determine/Missing	15	(4.1)
Intervention[a]		
None	116	(31.8)
Brief counseling	126	(34.5)
Crisis intervention	80	(21.9)
Other	1	(0.3)
Unable to determine/Missing	69	(18.9)
Consultation[a]		
Crisis Team	268	(73.4)
Child Psychiatry	220	(60.3)
Social Work	46	(12.6)
Other	6	(1.6)
Follow-Up Recommendation[a]		
Health care professional	153	(41.9)
Out-patient psychiatry program	109	(29.9)
Crisis Team	50	(13.7)
Child and Family Services	47	(12.9)
Other	16	(4.4)
Discharge status		
Family home	249	(68.2)
Group home	58	(15.9)
Admission to in-patient psychiatry program	20	(5.5)
Child and Family Services	12	(3.3)
As mature minor, on own	6	(1.6)
Other	5	(1.4)
None documented	3	(0.8)
Unable to determine/Missing	12	(3.3)

CT=Computed Tomography; MRI=Magnetic Resonance Imaging

[a] Total >100%; some children/youth had multiple responses

Wait times were not documented for all health care providers; not every child/youth saw all four health care providers and/or not all providers had a time documented (Table 3.8). Some maximum wait times were high due to children/youth having stayed overnight to see a health care provider the next morning. As illustrated in Figure 3.0, outliers existed within the data for physician, registered nurse, and child psychiatrist wait times. As shown in Table 3.9, the shortest median wait time was the time to see a registered nurse (wait time: 59 minutes, interquartile range [IQR]: 20 minutes, 2 hours 22 minutes) followed by the median time to see a physician (wait time: 1 hour 55 minutes, IQR: 56 minutes, 3 hours 55 minutes). The longest median wait time was the time to see the Crisis Team (wait time: 3 hours 38 minutes, IQR: 1 hour 52 minutes, 5 hours 20 minutes). The median wait times for a consultation with the crisis team and child psychiatrist were most variable (SD= 4 hours 48 minutes and 4 hours 27 minutes, respectively). The median length of ED stay (time from triage to ED discharge) for visits for behavioural disorders was 5 hours 33 minutes (IQR: 3 hours 41 minutes, 9 hours 15 minutes). The maximum length of stay was reported to be 2 days 18 hours and 43 minutes.

Table 3.8 Health care provider involvement and time documentation during ED visits (n=365), n (%)

	Provided care		**Provided care with time documented**	
Physician	313	(85.8)	194	(53.2)
Registered Nurse	254	(69.6)	220	(60.3)
Child Psychiatrist	209	(57.3)	27	(12.9)
Crisis Team	93	(25.5)	49	(13.4)

Figure 3.0 ED wait times for different health care providers

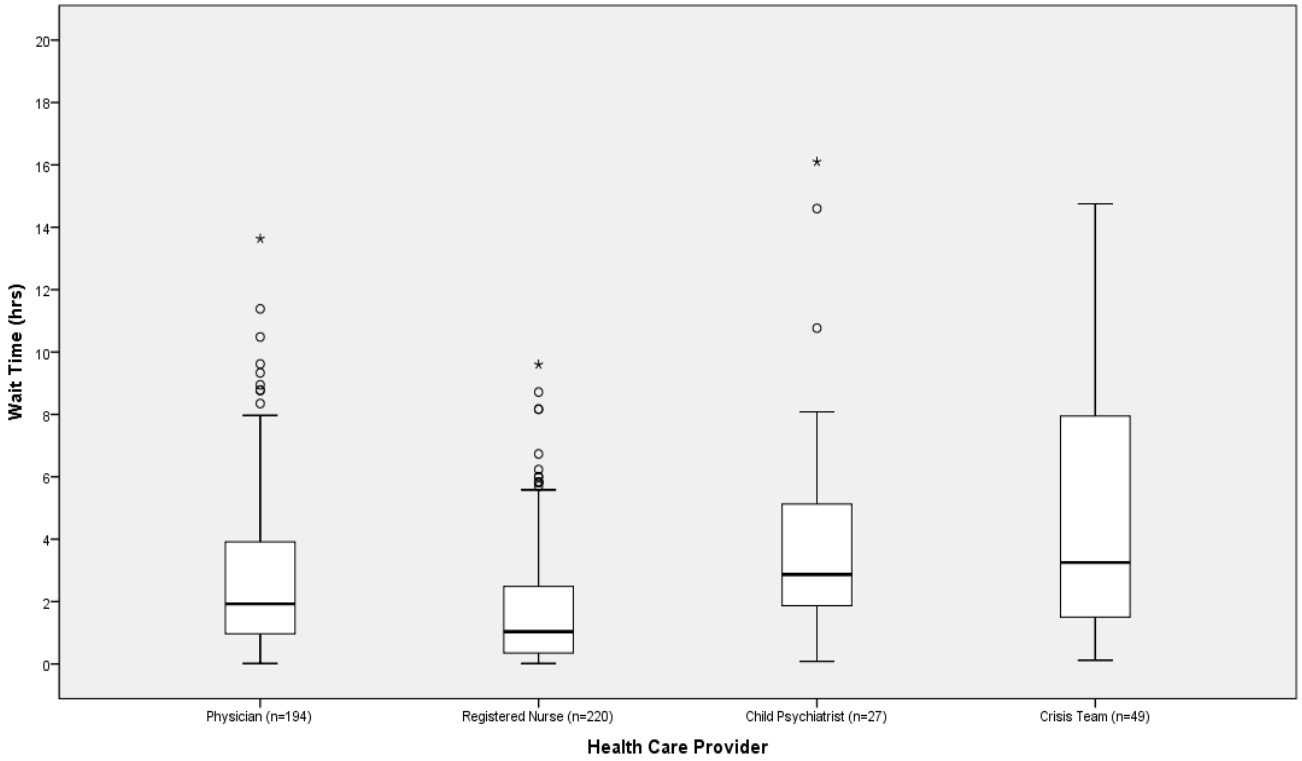


Table 3.9 Length of wait time by health care provider and overall length of ED stay

	N	Mean	SD	Min	Max	Q1[a]	Q2[b]	Q3[c]
Physician	194	2h 42m	2h 24m	0h 1m	13h 38m	0h 56m	1h 55m	3h 55m
Registered Nurse	220	1h 0m	1h 45m	0h 1m	9h 36m	0h 20m	0h 59m	2h 22m
Child Psychiatrist	27	5h 28m	4h 27m	0h 7m	16h 25m	2h 10m	3h 5m	9h 59m
Crisis Team	49	4h 23m	4h 48m	0h 5m	14h 27m	1h 52m	3h 38m	5h 20m
Length of Stay								
Total	365	7h 31m	6h 7m	0h 24m	66h 54m	3h 41m	5h 33m	9h 15m

h=hour; m=minute; SD=standard deviation

[a] 25% percentile

[b] 50% percentile (median)

[c] 75% percentile

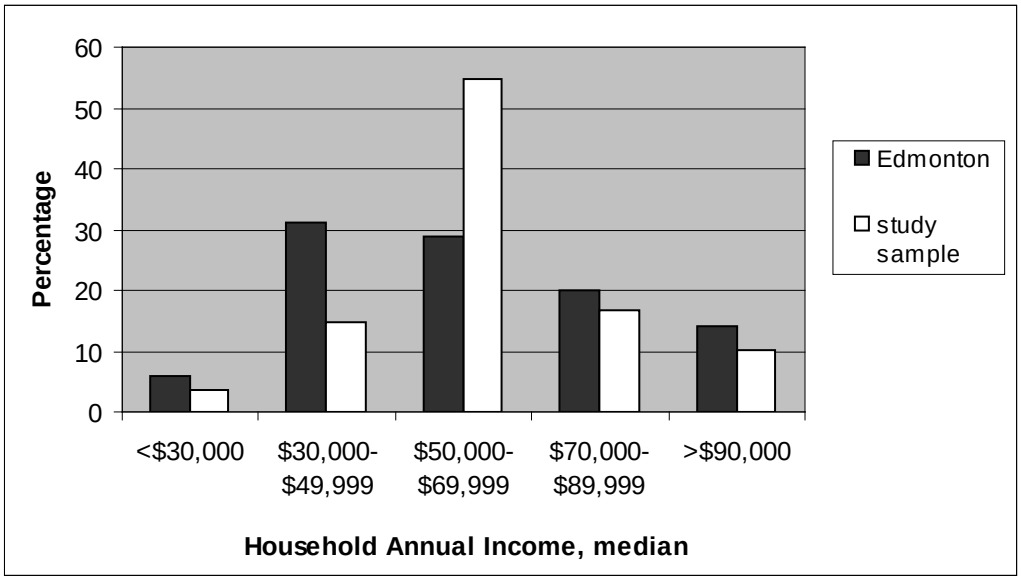
Post Hoc Analyses for Further Investigation of Trends

Post hoc analyses were conducted when questions were raised after initial analyses; these analyses provided another perspective for specific results in my study. The analyses that were performed included an exploration of: (1) the distribution of median household annual income for families in Edmonton; (2) ED visit times; (3) wait times stratified by triage level and provider; and (4) psychiatric co-morbidity and medical resources across household annual income and social service involvement.

(1) Exploring distributions of median household annual income

The distribution of median household annual income for families in Edmonton was compared to my study sample to determine if the sample distributions were similar (Figure 3.1). The distributions were similar with the exception of the low ($30,000 to $49,999) and middle ($50,000 to $69,999) income groups. The number of children and youth with a household annual income of $30,000 to $49,999 in my study was about half of the number found in Edmonton's population. My sample also had about two times more children from families with a household annual income between $50,000 and $69,999.

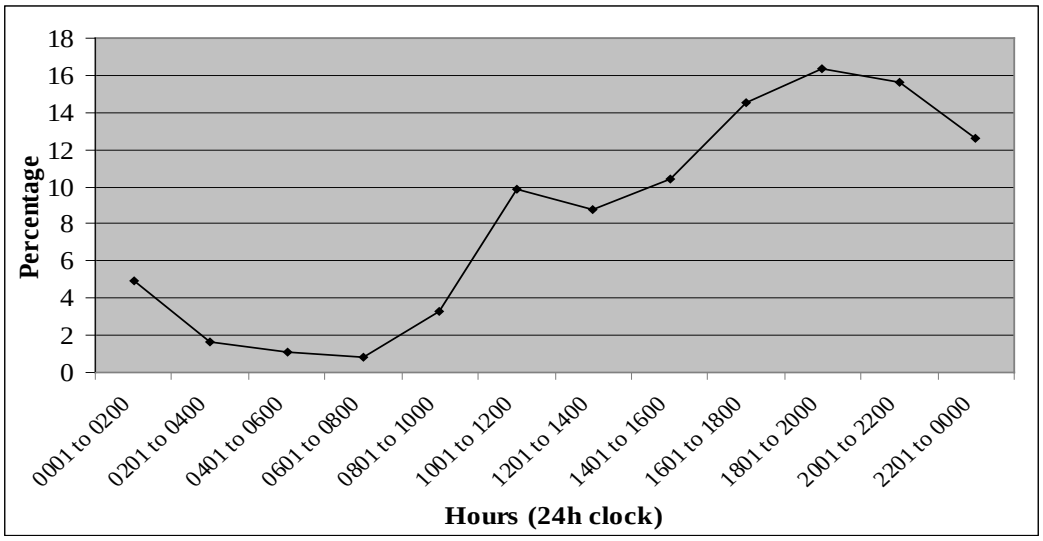
Figure 3.1 Comparison of distribution of household annual income in Edmonton and my study sample



(2) Exploring ED visit times

ED visit time (using time of triage) was explored to see when (time of day) children and youth were visiting the ED for a behavioural disorder (Figure 3.2). Peak visit times were in the evening between 4pm and midnight (1600h to 0000h). Fewer visits were made to the ED for pediatric behavioural disorder emergencies between the hours of midnight to 6am (0000h to 0600h).

Figure 3.2 Triage times by visit time of day (n=365)



(3) Exploring wait times among triage levels by health care provider

The median wait time for different health care providers was examined to investigate whether wait time differed by triage level (Table 3.10 and Figure 3.3). Across all health care providers, visits that were triaged as Emergent (Level 2) had the highest median wait time for mental health consultations. Visits that were triaged as Urgent (Level 3) had shorter median wait times to see a physician and registered nurse than visits that were triaged as Emergent (Level 2) to see the same providers. Visits that were triaged as Semi-Urgent (Level 4) had the longest wait times to see all health care providers except a child psychiatrist. Visits that were triaged as Semi-Urgent (Level 4) to see a child psychiatrist had limited data and not included in the comparison. There were several outliers for wait times across all health care providers and triage levels except for wait times to see the crisis team (as shown in Figure 3.3). When examining differences in wait times for care among triage level for each health care provider separately, wait times

differed when waiting to see a registered nurse (KW $x^2_2 = 7.13$, p-value = 0.0282; see Table 3.11 and Figure 3.4).

Table 3.10 Wait time for different health care providers by triage level*

	Emergent (Level 2)	Urgent (Level 3)	Semi-Urgent (Level 4)
Physician			
Median	2h 1m	1h 45m	2h 40m
IQR	1h, 4h 13m	55m, 3h 34m	42m, 5h 50m
Registered Nurse			
Median	1h 6m	0h 43m	2h 6m
IQR	22m, 2h 38m	17m, 2h 10m	55m, 3h 38m
Child Psychiatrist			
Median	2h 45m	3h 8m	—
IQR	1h 27m, 4h 45m	1h 57m, 8h 0m	—
Crisis Team			
Median	3h 23m	2h 45m	4h 56m
IQR	2h 5m, 10h 54m	1h 25m, 7h 57m	1h 54m, 12h 40m

h=hour; m=minute; IQR=interquartile range
* Triage level 5, Non-Urgent, (n=1) is not displayed

Table 3.11 Pairwise comparisons by triage level

	Test Statistic	SE	p-value	Adjusted p-value*
Urgent vs. Emergent	16.347	8.876	0.066	0.197
Urgent vs. Semi-Urgent	-43.888	19.309	0.023	0.069
Emergent vs. Semi-Urgent	-27.540	19.523	0.158	0.475

SE=standard error
* Kruskal-Wallis test, adjusted for multiple comparisons, using Bonferroni method.

Figure 3.3 ED wait times among triage levels by health care providers

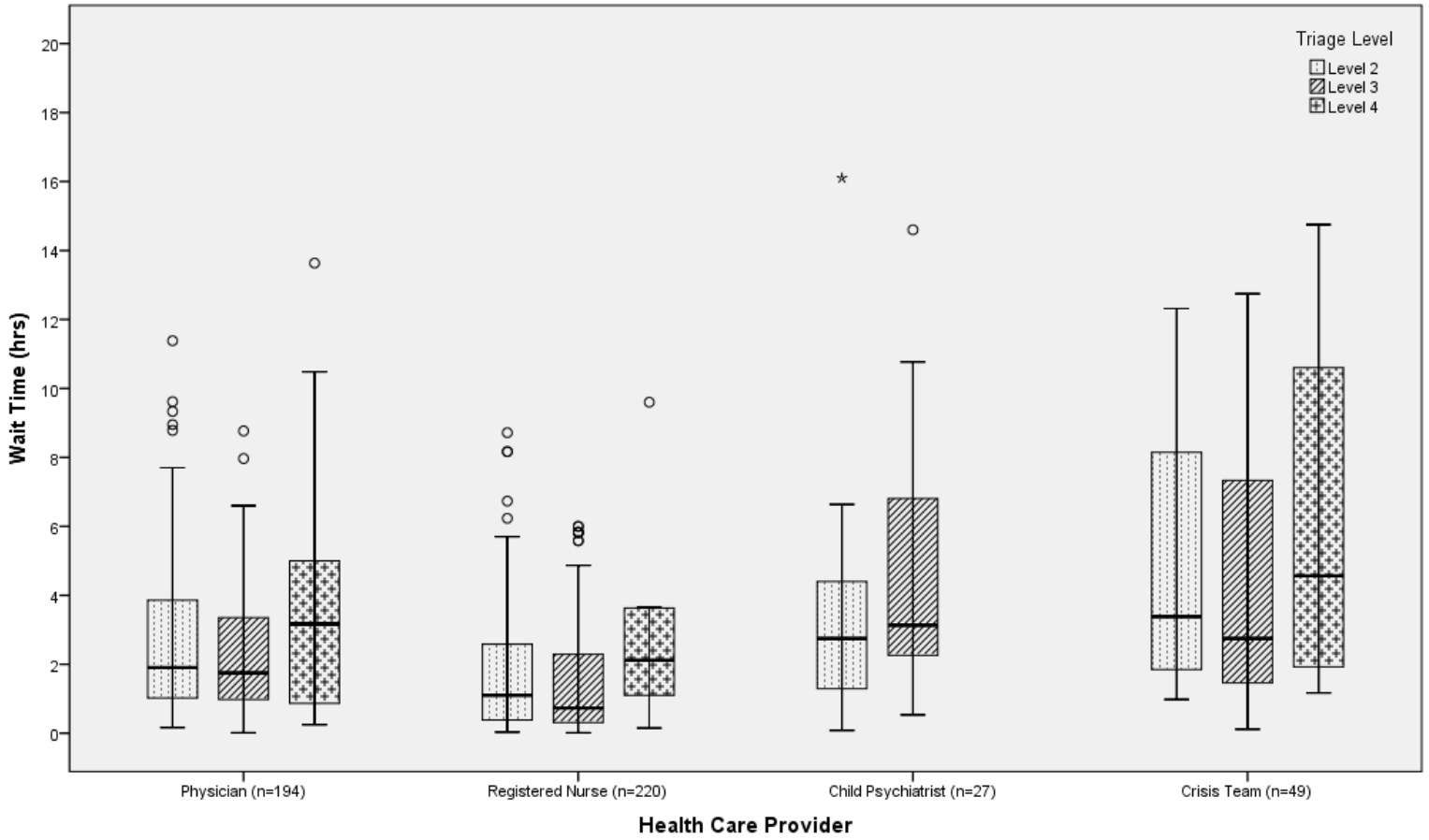
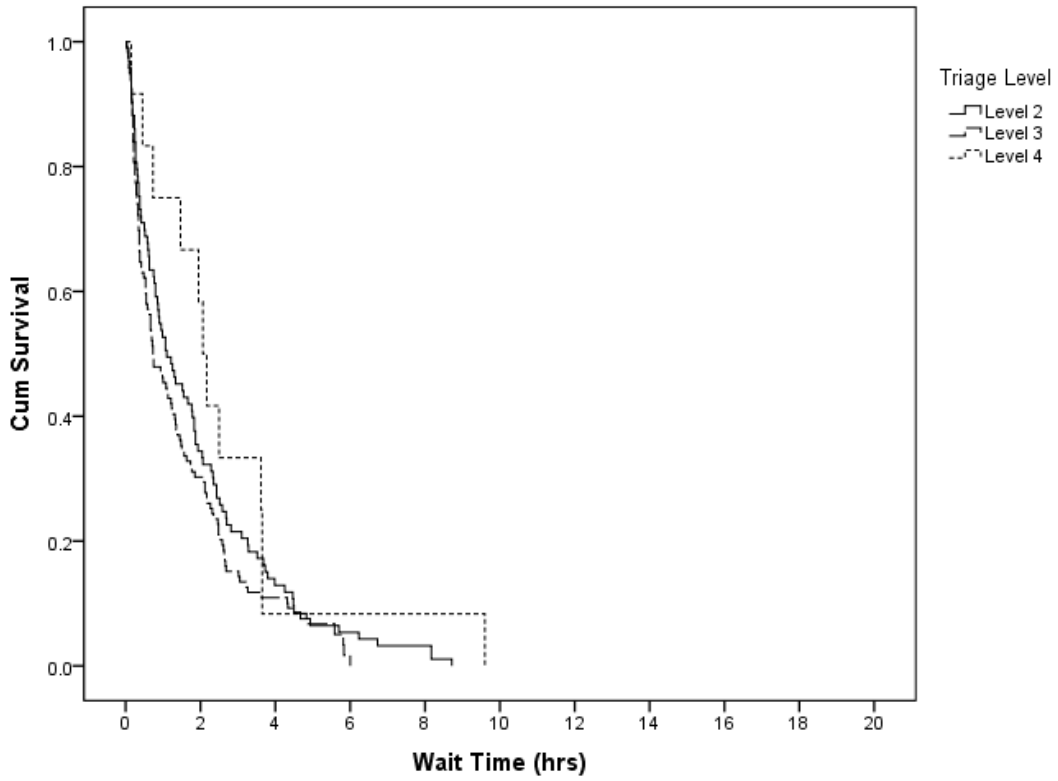


Figure 3.4 Kaplan-Meier survival curve for wait time of care for a registered nurse



(4) Exploring psychiatric co-morbidity and medical resources across household annual income and social service involvement

Psychiatric co-morbidity and current medical resources were examined across household annual income and social service involvement. These characteristics were variable in children and youth across household annual income and social service involvement. Chi-square and Fisher's exact tests were conducted to determine if children and youth from different household annual income levels or with different social service involvement were similar/dissimilar in characteristics such as psychiatric co-morbidity and current medical resources. However, in my study, there was no evidence of a significant association between having a psychiatric co-morbidity and household annual income or social service involvement (Table 3.12). There was also no evidence of a significant association between having a current medical resource and household annual income. There was, however, evidence of a statistically significant association with having a medical resource and social service involvement (Table 3.13).

Table 3.12 Psychiatric co-morbidity across household annual income and social service involvement (n, row %)

	Psychiatric co-morbidity*				
	Yes		No		p-value
Household Annual Income, median (n=303)					
<$30,000	7	(63.7)	4	(36.4)	0.438[i]
$30,000-$49,999	21	(46.7)	23	(51.1)	
$50,000-$69,999	104	(62.3)	62	(37.1)	
$70,000-$89,000	31	(60.8)	20	(39.2)	
<$90,000	20	(64.5)	11	(35.5)	
Social service involvement (n=322)					
Temporary care[a]	38	(57.6)	27	(40.9)	0.446[ii]
Other[b]	155	(59.8)	102	(39.4)	

[*] Unable to determine/Missing category was not included in the analysis
[a] Group home or foster family
[b] Adopted home, biological family, or undocumented
[i] Pearson chi-square test
[ii] Fisher's exact test

Table 3.13 Medical resources across household annual income and social service involvement (n, row %)

	Psychiatrist		Psychologist		Family physician/ Pediatrician		Other		None stated by family		p-value*
Household Annual Income, median (n=305)											
<$30,000	6	(54.5)	1	(9.1)	0	(0.0)	0	(0.0)	2	(18.2)	0.851
$30,000-$49,999	17	(37.8)	2	(4.4)	5	(11.1)	3	(6.7)	2	(4.4)	
$50,000-$69,999	69	(41.3)	24	(14.4)	14	(8.4)	15	(9.0)	8	(4.8)	
$70,000-$89,000	26	(51.0)	8	(15.7)	6	(11.8)	5	(9.8)	1	(2.0)	
<$90,000	12	(38.7)	0	(0.0)	4	(12.9)	3	(9.7)	1	(3.2)	
Social service involvement (n=325)											
Temporary care[a]	37	(56.1)	6	(9.1)	5	(7.6)	3	(4.5)	0	(0.0)	0.037
Other[b]	100	(38.6)	34	(13.1)	25	(9.7)	25	(9.7)	15	(5.8)	

* Fisher's exact test

[a] Group home or foster family

[b] Adopted home, biological family, or undocumented

Chapter Four: Discussion

The objectives of my Master's Thesis project were to describe patient and treatment characteristics for children and youth who presented to an urban, tertiary care emergency department (ED) with an emergency for a behavioural disorder. There were several key findings from my descriptive study that I will discuss in this chapter. In terms of child/youth characteristics: (1) many children and youth who visited the ED in crisis had co-morbid conditions, endangering presenting complaints, and were already involved in the health care system through various resource use; (2) across the ED presentations, there were distinct trends for gender and diagnosis as well as age and diagnosis; (3) the majority of children and youth who presented to the ED came from families with a 'middle class' income; (4) suicide-related thoughts/behaviours often precipitated the ED visit; and (5) one in five children/youth were living in out-of home care (e.g., group homes or foster families). In terms of health care visit characteristics: (6) more than 50% of ED visits were triaged as clinically urgent; (7) the majority of ED visits included a mental health consultation and follow-up recommendation to see the child/youth's regular health care provider; and (8) the median length of ED stay for children and youth exceeded five hours. These findings both reflect trends observed by other research studies and add a unique perspective of the reasons why parents bring their children to the ED and the type of emergency care received for a behavioural disorder.

(1) Behavioural disorders and the family/child context

Important findings specific to the context of children with behavioural disorders and their families were found in my study. In my study, the majority of children and youth: (i) had a psychiatric or medical co-morbidity and almost half were taking psychiatric medications; (ii) presented to the ED with complaints of depression and suicide-related behaviours/thoughts or violent behaviours; and (iii) came to the ED in crisis with pre-existing involvement in the health care system (e.g., seeing a psychologist, psychiatrist).

The first two findings from my study suggest that families are dealing with more than behavioural issues, which may contribute to greater family stress. A known trend across North America is that more and more parents are seeking care for their children in EDs to stabilize acute emergencies related to mental health problems (Newton *et al.*, 2009; Reder & Quan, 2004; Grupp-Phelan *et al.*, 2009; Kennedy *et al.*, 2009), request guidance for at-home child management (Cloutier *et al.*, 2010), and gain access to health care resources (Cloutier *et al.*, 2010). Parents with children who have behavioural disorders with other co-morbidities may require immediate assistance of the ED to help address needs and behaviours that they feel they cannot manage at home. Further, parents with children who have depressed mood or express suicide-related behaviours may seek immediate care not knowing whether these behaviours are life threatening if not treated immediately. In my study, documentation showed that parents were looking for support during crisis times. As one nurse noted in a medical record, “parents are at the end of their rope” while other nurses wrote, “behaviours are becoming too

much for parents to handle" and "parents states they have no idea what else to do to help [patient]."

In my study I also found that almost half of the children/youth were currently taking psychiatric medications at the time of their ED visit. This finding is consistent with other studies that have reported large proportions of pediatric mental health study samples taking psychiatric medications (Grupp-Phelan *et al*., 2009; Kennedy *et al*., 2009). Attention deficit hyperactivity disorder (ADHD) and conduct disorders, two key diagnoses in my study, are the most common diagnoses linked to antipsychotic medication use in Canada (Alessi-Severini *et al.*, 2012), and may be one reason why medication use was common in my study. Psychiatric and other medication use can also add to the medical priorities to be addressed by parents of children with behavioural disorders. This situation, in turn, may contribute to greater family stress and behavioural management needs, and in my study, may be reflected in the need to seek additional support, resources, and/or care in the ED.

A third finding from my study that emphasized the child and family context was that the majority of children and youth who visited the ED in crisis were already involved in the health care system (e.g., seeing a psychologist, psychiatrist). This finding suggests that families may be seeking additional mental health services for their children for ongoing and unresolved needs. The medical records in my study indicated that many problems were chronic and symptoms of a larger problem. Limited service availability (e.g., traditional 'office hours') and/or a lack of services available to children and youth (Waddell *et al.*, 2007;

Reid & Brown, 2008; Eggerston, 2005) may have led to families in my study seeking help in the ED for immediate and unscheduled care. For example, several medical records indicated that parents were told to bring their child to the ED for a psychiatric assessment after an appointment at an out-patient mental health clinic. Further, a post hoc analysis of ED visit times (using time of triage) showed that peak visit times were in the evening between 4pm and midnight. This would likely be outside traditional office hours. Such findings in my study point to important questions regarding the role of the ED in children's mental health care, and if it should be used as a 'stopgap' for the mental health care system or if the mental health care system needs to put measures and metrics in place to address chronic issues such as limited program funding, long wait-lists (e.g., high demand for services, but decreased resources to provide services), increased case complexity, and poor service integration and coordination to meet child and family needs (Reid & Brown, 2008; Kirby & Keon, 2004; Canadian Association of Paediatric Health Centres, The National Infant, Child and Youth Mental Health Consortium Advisory, The Provincial Centre of Excellence for Child and Youth Mental Health at CHEO, 2010).

In 2009, Grupp-Phelan and colleagues reported that about one third of the children in their study who visited the ED for a mental health emergency had prior visit to the ED because of a mental health presentation and another one third of the children had prior admission for a mental health presentation (Grupp-Phelan *et al.*, 2009). In my study, it was difficult to reliably determine prior mental health presentations and admissions from the medical record. While I was

able to determine repeat ED visits during the study period to the same ED, I was unable to accurately determine if a child or youth had visited other hospitals or had been admitted to the hospital through medical record documentation. This is an aspect, however, that should be explored further. Knowledge of repeat visits, previous visits to other hospitals, and hospital admissions will help to better understand health care utilization for these children/youth, identify patterns of use, and allow identification of gaps in the system (such as availability of community services).

Although parents seek care in the ED for immediate help, the time with a nurse or physician in the fast-paced emergency setting may not be adequate to properly address underlying family and child behaviour issues. Children with behavioural disorders benefit most from interventions that are targeted towards both parents and child as underlying family issues and dysfunctions relative to the behavioural problem are common (Searight *et al.*, 2001). Thus, assessing the needs of the families being served is fundamental to designing services to meet those needs. Future studies can extend my findings related to child and family context by using qualitative methodology to explore underlying family needs that may precipitate or exacerbate the crisis leading up to the ED visit, and parents' expectations of mental health services in the ED and whether they were met or not. Further, prospective studies should be designed to follow families after the ED visit to assess the period after the acute crisis to determine: (a) whether ED discharge recommendations were implemented, and (b) the course of families (e.g., in the health care system, educational system, etc.). These study findings can

lend perspective on how services are used, accessed, and perceived by families. This knowledge, in turn, can be used to inform recommendations for health care services, policy, and family partnerships (e.g., family-school relationship).

(2) The relationship between behavioural disorders and gender and age

Gender differences have been documented for behavioural disorders. In general, more boys than girls are diagnosed with a behavioural disorder while more girls are diagnosed with anxiety and mood disorders (Merikangas *et al.*, 2010; Murry *et al.*, 2010; Zwirs *et al.*, 2007). The relationship between gender and behavioural disorder diagnosis in my study was statistically significant. Consistent with previous studies (Merikangas *et al.*, 2010; Murray & Farrington, 2010; Zwirs *et al.*, 2007), and as hypothesized, I found that more males were seen in the ED during my study period for a behavioural disorder. In my study, more males were diagnosed with hyperkinetic and conduct disorders compared to females.

More researchers are exploring gender differences, especially in ADHD (Biederman *et al.*, 2012; Monuteaux *et al.*, 2007; Tung *et al.*, 2012; Elkins *et al.*, 2011). It has been suggested that gender differences can be a function of study methodology and developmental stage (Tung *et al*., 2012). In terms of developmental stage, Tung and colleagues have stated that differences in maturation may affect children's responses to external stressors, e.g., boys may respond to social stressors with aggression while girls may respond to the same stressors by seeking social support to reduce the stress. Gender differences are also proposed to exist in behavioural disorders because boys are more likely to

demonstrate physical aggression and other externalizing behaviours compared to girls who exhibit more relational aggression and internalizing behaviours (e.g., inattentiveness and anxiety) (Zahn-Waxler *et al.*, 2008b; Miller *et al.*, 2010). In my study, I was not able to determine from the medical records whether physical or relational aggression, or externalizing or internalizing behaviours, underpinned presenting complaints for boys and girls. Differentiating between these gender differences, however, would be an asset for informing ED care. Thus, rather than focusing the visit solely on the overt behaviour (aggression, suicide attempt), by determining the specific issues that underpin the behaviour (e.g., anxiety) parents and children can be provided with specific recommendations for post-crisis services as well as recommendations for how to manage issues that are based on the unique needs of the child and family.

In my study I also found a statistically significant association between age and type of behavioural disorder. Children/youth in my study with a diagnosis of hyperkinetic disorder (ADHD) were younger compared to those diagnosed with another behavioural disorder. To date, and to my knowledge, a small number of studies have been published exploring age trends in diagnoses of behavioural disorders. Recently, the Center for Disease Control and Prevention reported that ADHD diagnosis in children in the United States increased 5.5% from 2003 to 2007 with a greater rate among older children than younger children (Center for Disease Control and Prevention Website, accessed March 3, 2013). There is also agreement in the literature that the diagnosis of many childhood mental health disorders, especially in early childhood is difficult (Davis & Williams, 2010).

Childhood ADHD has been considered one of the more difficult disorders to diagnose because of normal variations in the developing child and child temperament (Davis & Williams, 2010). Researchers suggest that a developmentally based definition of ADHD is needed, especially for diagnosing preschool-age children (Chacko *et al.*, 2009). Similar to the study conducted by Center for Disease Control and Prevention, using a cross-sectional methodology examining prevalence of behavioural disorders at different periods of time may help understand age trends for diagnosis. Further prospective cohort studies exploring behavioural disorders in children and youth may also help determine the incidence of behavioural disorders and highlight age trends in diagnosis.

(3) Behavioural disorders and socioeconomic status

I had originally hypothesized that children with a low socioeconomic status (SES) would visit the ED more for a behavioural disorder than children with a higher SES. I based this hypothesis on research that has demonstrated that children from a lower SES background are at higher risk for behavioural problems (Schonberg & Shaw, 2007; Van Oort *et al.*, 2011). On the contrary, in my study, the majority of children were from families with a median household annual income of $50,000 to $69,000, which can be considered ‘middle class’. This finding is similar to an earlier study conducted by Newton and colleagues (2011a) who reported the majority of children/youth with mental health visits to EDs in Alberta came from families with median household income of a comparable range. When I compared my study sample to that of Edmonton’s population, I found that my sample had approximately two times more children/youth from

families with a ‘middle class’ annual income, and fewer children/youth from families with a lower median household annual income between $30,000 and $49,999.

These study findings may help explain health care access and utilization by families of children with behavioural disorders, and with further investigation, could identify important issues for health care service delivery. One line of thinking is that children of parents with a lower SES may be under-represented in my study because of more limited access to the ED compared to those children/youth from middle and higher household incomes. For example, parents with a lower SES may have limited or no transportation means to travel to the ED or have no child care for the other children in the family during an ED visit. Further, these parents may not access the ED because of lower parental discipline efficacy and education. Studies have reported that parental discipline efficacy (parents’ perception of discipline and difficulties they are experiencing) and parental education (knowledge of behavioural problems), which may be associated with SES, are key factors to accessing care (Harrison *et al*., 2004; Sayal *et al*., 2010).

Another explanation for the low representation of families with a lower SES in my study may be related to health care subsidies afforded to families in this income bracket by the government of Alberta (e.g., reduced payments for specialized mental health services or programs because of income level). In essence, families from lower income brackets may not be accessing the ED for health care because they are able to access a range of community-based services

to meet their child's needs through government assistance. A similar line of thinking relates to the number of ED presentations by children/youth from families with 'middle class' income levels. The large representation of these families in my study may have been because parents in this income bracket do not qualify for subsidized health care services or have the financial means to afford needed health care services that do not fall under provincial health care coverage (e.g., psychologist, private counseling). Similar to recommendations suggested earlier for better understanding the family and child context, additional research studies are needed to explore why families seek or do not seek care in the ED for their child's behavioural disorder, which may further explain factors related to health care accessibility and utilization, and point to areas of health policy (e.g., government assistance) and/or service delivery (e.g., telehealth or web-based resources to address transportability issues, resources to improve parental knowledge) that are needed to support parents of children with a behavioural disorder.

(4) Suicide-related thoughts and behaviours in children and youth with behavioural disorders

A recent study in Israel reported that adjustment disorder, ADHD, and conduct disorder were the three most common diagnoses given to children (≤ aged 12 years) attending a psychiatric ED with suicidal ideation or attempt (Ben-Yehuda *et al.*, 2012). In the same study, the most common diagnoses given to youth (> 12 years) presenting for the same reasons were depression, adjustment disorder, and conduct disorder. Similarly, in my study, the majority of children

and youth who visited the ED for a behavioural disorder did so because of a precipitating suicide-related gesture or attempt. The finding of suicide-related behaviours for children and youth with behavioural disorders surprised me as I hypothesized that the most common events leading up to the ED visit would be violence related because of the externalizing nature of the diagnoses. The children and youth in my study received mood and suicidality assessments alongside mental health and social work consultations based on their primary complaints and precipitating suicide-related events.

Several studies report behavioural disorders as a risk factor for suicide-related behaviours and support the connection between aggression and impulsivity and suicide-related behaviours (Manor *et al.*, 2010; Sourander *et al.*, 2009; Impey & Heun, 2011; Horest *et al.*, 1999; Kerr *et al.*, 2007; Kasen *et al.*, 2011). Impey and Huen (2011) raised a concern that it may be harder to detect suicide-related behaviours in children with ADHD and high impulsivity as such children may be less likely to regard self-injuries as suicide attempts. Another study found that while the majority of the youth who visited the ED for a suicide attempt were diagnosed with ADHD, only one third of these youth had been diagnosed prior to the suicide attempt (Manor *et al.*, 2010). The connection between ADHD and suicide-related behaviours in the literature supports recommendations for screening for ADHD symptoms in children and youth expressing suicidal thoughts and exhibiting related behaviours (Manor *et al.*, 2010). Likewise, screening for suicidal thoughts and behaviours should be incorporated into routine mental health and medical care for children and youth with behavioural disorders.

Care that addresses the link between behavioural disorder symptoms (impulsivity, aggression, and lack of risk awareness) and self-harm will be tailored for those children and youth who need it and can potentially reduce crises that need to be addressed in the ED.

(5) Social service involvement for children and youth with behavioural disorders

In 2007, 1% of children living in Alberta (8,891/841,392) under the age of 18 were living in out-of-home care (e.g., a group or foster home) (Children Child Welfare Research Portal Website, accessed June 14, 2012). Children in foster or group homes have been found to have more externalizing problems (e.g., violence, aggression) compared to children who do not live in such homes (Persi & Sisson, 2008). Hence, for my study, I hypothesized that children and youth with behavioural disorders living in foster or group homes would make up more of my study population, and that violence/aggression-related events would be the most common precipitating event prior to the ED for this population. During my study period, and contrary to what I had hypothesized, approximately one in five children/youth who visited the ED for a behavioural disorder had documentation of living in a group or foster home. Further, the majority of these children and youth visited the ED because of suicide gestures/attempts and not for violence/aggression-related events. Reasons for suicide-related behaviours are complex and, for children and youth with behavioural disorders, these behaviours may be related to reasons for out-of-home placement. In 2003, of the over 17,000 child investigations in Alberta, reasons for investigation included physical or

sexual abuse (20% and 3%, respectively), neglect (34%), emotional maltreatment (20%) and exposure to domestic violence (23%) (Children Child Welfare Research Portal Website, accessed Jan. 16, 2013). A recent Ontario-based study reported that children permanently removed from their homes due to maltreatment were five times more likely to visit the ED for suicide-related behaviour (Rhodes *et al.*, 2012). In my study, I was unable to determine the reasons why children and youth were placed in foster or group homes as documentation was minimal. This information, however, may have explained the high incidence of suicide-related events among this population in my study.

Of important note, in my study, I included children and youth with a main ambulatory diagnosis of a behavioural disorder. Thus, while the presenting complaint may have been documented as suicide-related (thought or behaviour), the final diagnosis assigned to the visits I reviewed was a behavioural disorder. As such, I identified the frequency of suicide-related complaints in this group of children and youth. I did not include in my study those children and youth with a behavioural disorder who visited the ED primarily for a suicide-related behaviour and who would have received this diagnosis as their main ambulatory diagnosis. Accordingly, my study may underestimate the number of children and youth in foster and group homes who have visited the ED for suicide-related events.

In my study, I compared social service involvement among children—children in temporary care (group home or foster family) to those in other care (adopted home, biological family or undocumented in the medical records and may be presumably with a biological family)—to determine if there were

differences between the two groups for the presence of co-morbid psychiatric disorders and in the use of medical resources. In my study population, there was no evidence of a statistically significant association between co-morbidity and social service involvement. However, I did find evidence of a statistically significant association between medical resources and children and youth in temporary care. I found that there was more medical resource use documented for children and youth in temporary care compared to other children and youth. Children in temporary care such as foster or group homes are reported to have more chronic health problems (Woods *et al.*, 2012; Leslie *et al.*, 2005). My study finding is consistent with several studies that have demonstrated that children in temporary care have higher rates of service use (Farmer *et al.*, 2001; Leslie *et al.*, 2005), and that children who have contact with social services, but who remain in their homes without social service involvement are less likely to gain access to mental health services (Leslie *et al.*, 2005). Leslie and colleagues (2005) have also found that rates of mental health service use increased immediately after contact with social services and proposed that contact with social services may act as a gateway to mental health services due to referrals generated by the investigation of the child's well-being. Woods *et al.* (2012) have suggested that specialized interventions for individuals entering out-of-home care would address the unique needs of children in this population and improve health quality. That there was a difference in medical resource use by children and youth in temporary care compared to children and youth in other care in my study raises several important and related issues for further investigation. Areas of further investigation include

addressing peaks in service use of children and youth in care (is this immediately after contact with social services?) and exploring service use in children who have had contact with social services but remained in their homes (do they have lower rates of service use?). Again, documentation was minimal and I was unable to ascertain from the medical records how long the children and youth in my study had been in temporary care. Training and education for group home workers and foster families about the needs of children and youth with behavioural disorders is also important and may play a critical role in regular, community-based service use and potentially a reduction in the need for emergency-based care.

(6) The clinical acuity of child and youth needs for behavioural disorders

Over half of the ED visits during the study period were triaged as clinically urgent in my study. This finding is consistent with the reported trend in Alberta for all ED mental health presentations (Newton *et al.*, 2011a), but contrary to what I had hypothesized, which was that children and youth would be triaged as less urgent (a Semi-Urgent or Non-Urgent triage level).

In my study, triage levels indicated ED visit urgency and were a good marker of the seriousness of presenting complaints and precipitating events (suicide-related events or violent behaviours). The association between visits triaged as Urgent and precipitating suicide-related events and violent behaviours has been noted in other studies (Edelsohn *et al.*, 2003; Chaput *et al.*, 2008). Notably, Edelsohn and collegues (2003) explored predictors of urgency in the pediatric ED setting and reported that violence was the only predictor of assigned urgency for children and youth with ADHD. Other studies have found that

majority of the mental health visits, in general, are triaged as clinically urgent (Newton *et al.*, 2011a; Smith *et al.*, 2008). These studies reinforce that mental health visits to the ED are during a time of crisis for the child/youth. Further exploration of how existing community-based mental health services for behavioural disorders or primary health care providers (e.g., general practitioners, pediatricians) taking care of children and youth with behavioural disorders can routinely screen or assess for suicidal thoughts/behaviours and violent behaviours may potentially reduce the number of urgent crises that need to be addressed in the ED.

(7) Treatment of and follow-up recommendations for child and youth behavioural disorders in the ED

Prior to conducting my study, I hypothesized that the majority of ED visits made by children and youth for behavioural disorders would involve mental health assessments. Indeed, mental health assessments, such as the assessment of mood and suicidality, were conducted for over 80% of visits. This percentage is higher than reported in a previous study examining care for a range of mental health emergencies to the same ED (Newton *et al.*, 2011a), however, in my study suicide-related thoughts and behaviours were a more common event leading up to the ED visit making these assessments clinically essential. Also documented for the majority of ED visits in my study was consultation with either a child psychiatrist or a crisis team, or for some visits, both. This statistic is double compared to the reported mental health consultations made for children coming to the same ED with a range of mental health emergencies (Newton *et al.*, 2011a),

but less than the number of consultations reported by another study (Grupp-Phelan *et al.*, 2009). In addition to my sample having greater representation of presenting complaints for suicide-related thoughts and behaviours, differences between these study findings and mine may be a result of differing resources available in the hospitals, attending physicians' preferences (referral and consultation patterns), and care management (conservative versus aggressive).

Although mental health assessments and consultations were frequently conducted during ED visits in my study, I had hypothesized that treatments would be few. In my study, approximately one third of visits had documentation of brief counseling with an ED care provider. Comparing my findings on documentation of brief counseling to a study of treatment/care for a range of pediatric mental health visits to the same ED (Newton *et al.*, 2011a), Newton and colleagues reported more than twice the number of children/youth had documentation of brief counseling. Differences between my study and Newton's may be due variability in data abstraction. More specifically, my study used stricter criteria for determining conduct of a brief intervention, which I determined was documented based on the following key phrases/words: "discussed setting clear boundaries", "crisis planning reviewed", "provided psychoeducation", and "reinforced importance of...". The lower frequency of documented brief counseling in the medical records included in my study may also be due to the family context of children with behavioural disorders; ED care providers may have felt that there was inadequate time for them to provide needed counseling to address underlying family issues and problems, and instead, requested consultations with psychiatric

health care providers (child psychiatry, crisis team) and social workers who provided the brief counseling. Social workers were involved in over 10% of the ED visits in my study, which was doubled as compared to Newton *et al.*'s study (2011a).

The majority of children and youth who visited the ED for a behavioural disorder during my study period did not have documented laboratory and imaging testing. This finding is different from other studies reporting a higher frequency of these tests (Grupp-Phelan *et al.*, 2009; Newton *et al.*, 2011a). Differences may, in part, be related to study populations; Newton *et al.*'s sample population included intoxicated patients diagnosed with substance abuse/misuse, which necessitated laboratory testing for toxicity and investigating events related to high-risk behaviours (e.g., unplanned intercourse). Moreover, blood work requisitions may be more frequently ordered for children with mental health presentations to rule out organic causes as emergency settings have been traditionally the safety net for acute health conditions. My study population consisted only of children and youth with behavioural disorders who came to the ED seeking help to resolve an acute situation of a chronic non-organic nature. Thus, it would be expected for the children and youth in my study to not have undergone laboratory and/or imaging testing.

Contrary to my hypothesis that a follow-up recommendation would be made for a clinic appointment with out-patient psychiatry for most children and youth, in my study, the recommendation more often was to follow up with a child/youth's primary health care provider. My hypothesis was based on the line

of thinking that psychological treatments would be few for children and youth in the ED and thus, specialty care would be recommended as follow-up care. In my study, the majority of the children and youth were already under care of a health care professional, so recommended follow-up with a current health care provider may reflect a standard recommendation for ED physicians under this circumstance. While determining whether this type of recommendation is appropriate was not an objective of my study, the lack of behavioural/mental health training for many pediatricians and family physicians (Rushton *et al.*, 2004) alongside the current lack of specialty mental health services and long wait-lists for available services (Waddell *et al.*, 2007; Reid & Brown, 2008; Eggerston, 2005), suggests that evaluating the appropriateness of follow-up recommendations and their effectiveness in the post-crisis period is an important aspect in need of further investigation. This line of investigation reflects current debate regarding the quality of care provided to children and youth in the ED for mental health emergencies. While it has been suggested that pediatric mental health care in the ED is resource intensive (Santagio *et al*., 2006; Christodulu *et al*., 2002; Mahajan *et al.*, 2009; Grupp-Phelan *et al.*, 2009), others have challenged this assertion stating that gaps in comprehensive care including discharge planning and follow-up recommendations are evident and improvements to clinical management is important (Newton *et al.*, 2011a).

(8) Wait times for children and youth with behavioural disorders in the ED

Prior to conducting my study, I hypothesized that wait times for care would be more than one hour. I based this expectation on previously reported

studies of long lengths of ED stays (Grupp-Phelan *et al.*, 2009, Mahajan *et al.*, 2009, Waseem *et al.*, 2011) and hypothesized that wait times for care would also be long. I also based my hypothesis on wait times for care in conjunction with my other hypothesis that children and youth in my study would be triaged as less urgent (a Semi-Urgent or Non-Urgent triage level). In my study, the shortest median wait time was the time to see a registered nurse. Longer median wait times were experienced by children and youth to see a physician and specialty mental health services.

I also performed Kruskal-Wallis test as a post hoc analysis to better understand wait times for care among triage level by different health care provider separately. Wait times differed when waiting to see a registered nurse by triage level, but after adjusting for multiple comparisons, I was unable to detect any evidence of a statistically significant relationship meaning there was no difference in wait time for care among triage level by health care provider. This finding is similar to an unpublished study conducted by Soleimani and colleagues (2012) that demonstrated the wait to see the first ED health care provider did not correspond with the assigned urgency in triage level. For example, Soleimani *et al.* found that visits triaged as Non-Urgent (triage Level 5) had median wait times that were comparable to more urgent visits triaged as Emergent (triage Level 2). In response to this finding, Soleimani *et al.* proposed that ED physicians were able to expedite the care for Non-Urgent visits due to fewer resources and supports required in the ED and that such patients could be treated in a 'clinical fast track' area of the ED, which allows ED health care providers to expedite

waits and treatment times for less urgent clinical care. Another recent Canadian study concluded that there was an association between triage level and wait time for care by a physician (Atzema *et al.*, 2012). Wait times will vary due to available resources, diagnosis and treatment complexity, ED occupancy and volume, as well as the clinical urgency of other patients in the ED; thus, there are multiple factors that influence wait times beyond triage level (Hutten-Czapski, 2010; Arkun *et al.*, 2010; Wipler *et al.*, 2004; Nelson *et al.*, 2009; Richards *et al.*, 2006; Yoon *et al.*, 2003; Atzema *et al.*, 2012). Case *et al.*'s study (2011) reported that almost 50% of mental health visits were recommended (at triage) to be seen within 15 to 60 minutes compared to approximately 40% of non-mental health visits that were recommended to be seen within the same time frame. To date and my knowledge, there have been no studies exploring wait time for care specifically for children seen in the ED for suicide-related/violent behaviours. Further exploration of wait times for care is needed to better understand the context for children and youth with behavioural disorders in the ED. A prospective observational study examining ED occupancy and volume, staffing, and clinical urgency of other patients in the ED and wait times may better determine factors that influence wait times aside from triage level.

The median length of stay for children and youth during my study period exceeded five hours, which was higher than previously reported times for mental health visits in the ED (Grupp-Phelan *et al.*, 2004; Santiago *et al.*, 2006; Newton *et al.*, 2011a), but did not exceed recommended national benchmarks (Canadian Association of Emergency Physicians, 2009). There have been studies that linked

longer length of stays with subspecialty consultations, night shift arrival and clinical stability as well as acuity, sex and race of patients (Nelson *et al.,* 2009; Chang *et al.*, 2012). The longer median length of stay in my study is likely skewed as the maximum length of stay was reported to be almost three days. The length of stay in my study may also reflect the wait for mental health or social work consultations (Nelson *et al.*, 2009), time of visit (visits peaked during evenings which may be during night shift arrivals) (Nelson *et al.*, 2009) or adequate time for a child/youth's behaviours to de-escalate before examination or treatment (clinical stability) (Chang *et al.*, 2012).

Study Limitations

My study had several limitations. As a medical record review, my study is subjected to limitations that are inherent to any study with a retrospective design. For example, relying on data recorded for clinical purposes (and not for research) meant that the records I reviewed contained missing and unclear information that hindered the quality and quantity of data available for my study (Worster & Haines, 2004). At times during data abstraction it was unclear if certain child and treatment characteristics were either not applicable/did not occur or were not documented in the medical record, but did occur. While a prospectively designed study could have addressed these limitations, such a time-consuming and expensive approach to my graduate research project was not feasible. A second limitation of my study relates to setting; the ED where I obtained the medical records was a psychiatric-resourced ED and not part of a pediatric hospital. Therefore, there may be a natural selection bias in which children/youth attend

such an ED, and my study sample may not be representative of the general population of children and youth with behavioural disorders who visit an ED in crisis. Conducting my study at a psychiatric-resourced ED may have also overestimated the number of mental health consultations that occur, which may not be representative of ED treatment elsewhere.

Another limitation of my study relates to diagnosis. The main ambulatory diagnosis was used as an inclusion criterion for my study; therefore, any differences in physician/nosologist coding for diagnosis may have meant that the characteristics in my study do not represent the children and youth who visit the ED for a behavioural disorder. This is an issue that I discuss related to suicide-related behaviours. Children and youth who presented to the ED for these behaviours secondary to a behavioural disorder may have had suicide-related behaviours noted in their main ambulatory diagnosis; as a result, such children and youth would not have been identified for inclusion in my study. It is standard that a main ambulatory diagnosis reflects the primary ED treatment/care provided for a particular condition (in the case of suicide-related behaviours it would be physical or medical care). I chose the main ambulatory diagnosis as a criterion to determine my study sample because I wanted to include children and youth who visited the ED primarily for their behavioural disorder and not other reasons (e.g., pneumonia in a child with ADHD) to more accurately describe care for the behavioural disorder.

In my study, full postal codes were collected to determine dissemination areas, which were then used to convert into median household annual income.

Dissemination areas provide group-level data, but not individual characteristics potentially introducing an 'ecologic fallacy' (when one attributes information to an entire group) characteristics that may not in fact be true for individuals, into my study. Median household annual income was chosen as the proxy for SES instead of average household income because median household annual income is not likely to be affected by extreme high and low values. Other potential indicators for SES that have been used in other studies (e.g., parental education or family government subsidy levels) were unavailable for collection in my medical record review.

Chapter Five: Conclusions

The objectives of my Master's Thesis project were to describe patient and treatment characteristics of children and youth who visited the emergency department (ED) for a crisis related to their behavioural disorder. Specifically, I aimed to: (1) describe the sociodemographic characteristics of children and youth and any differences between children and youth treated for different behavioural disorders; (2) determine the common events leading up to the ED visit; (3) describe the urgency of visits to the ED; (4) describe treatments provided, assessments conducted, follow-up arrangements and the disposition status of visits; and (5) determine ED wait times for care.

Using medical record review methodology, in this thesis I examined patient and treatment characteristics for all children and youth who visited an urban, tertiary care ED between January 1, 2009 and December 31, 2011. Children and youth, aged 10 to 17, were included in the study if they were assigned a main ambulatory diagnosis using the *International Statistical Classification of Diseases and Related Health Problems Canadian version (ICD 10, CA)* for a behavioural disorder (ICD codes F90-F92). Of the medical records reviewed for my project, 325 children and youth made 365 visits to the ED for a behavioural disorder.

Brief Summary of Major Findings

In terms of child/youth characteristics: (1) many children and youth who visited the ED in crisis had co-morbid conditions and endangering presenting complaints, and were already involved in the health care system through various

resource use; (2) across the ED presentations, there were distinct trends for gender and diagnosis as well as age and diagnosis; (3) the majority of children and youth who presented to the ED came from families with a 'middle class' income; (4) suicide-related thoughts/behaviours often precipitated the ED visit; and (5) one in five children/youth were living in out-of home care (e.g., group homes or foster families).

In terms of health care visit characteristics: (1) more than 50% of ED visits were triaged as clinically urgent; (2) the majority of ED visits included a mental health consultation and follow-up recommendation to see the child/youth's regular health care provider; and (3) the median length of ED stay for children and youth exceeded five hours. These findings both reflect trends observed by other research studies and add a unique perspective of the reasons why parents bring their children to the ED and the type of emergency care received for a behavioural disorder.

Thesis Implications

Although my study is limited to children and youth who visited an urban, tertiary care ED, my project identified key trends in the ED that have been published in other settings (e.g., community, primary care) and areas in need of further investigation so that we can: (1) better understand the needs of children and youth with behavioural disorders and (2) ensure optimal care while being treated in the emergency care setting. The other research areas that I feel need to be explored further include:

(1) Qualitative studies are needed to evaluate the needs of the families being served, the parents' expectations of mental health services in the ED, and whether they were met. Such a research approach will provide a more in-depth description of families' experiences than cannot be gleaned from a cross-sectional survey or medial record review. A qualitative study in Australia exploring parents' attitudes, expectations and beliefs of using the ED for non-urgent illnesses found that there was a perceived lack of access to community services among parents and a visit to the ED was often followed by dissatisfaction with community services (Woolfenden *et al.*, 2000). A future qualitative study to evaluate the needs and expectations of parents in the context of mental health services in the ED may also describe broad health care system issues that underpinned the reason for the ED visit (e.g., on a wait list for behaviour-based services) and expectations that the ED could expedite time to community-based care. Recommendations could be developed based on these issues such as: (i) the role of the ED for referral to services, and (ii) the type of information provided to parents in the ED on access to mental health care services.

(2) A better understanding of health care utilization for child/youth behavioural disorders both before the ED visit and after the visit is needed. This includes prospectively or retrospectively exploring return ED visits, visits to other hospitals including any hospital admissions to identify patterns of health care use and any service gaps in the mental

health care system. New knowledge of health care utilization and service gaps will help identify factors related to health care accessibility and utilization, and may point to areas of health policy (e.g., government assistance) and/or service delivery (e.g., telehealth or web-based resources to address transportability issues, resources to improve parental knowledge) that are needed to support parents of children and youth with a behavioural disorder. Furthermore, it may help address the needs for children and youth with mental health disorders in a more effective and efficient health care system, potentially reducing crises in the ED and help clarify the role of the ED.

(3) It is difficult to determine the quality of ED care from a retrospective medical record review. As such, ED-based prospective studies designed to determine and evaluate care using a validated instrument are ideal. Dharmar *et al.* (2007) reinforce that the structure of ED care influences care processes, which in turn, influences patient outcomes. Dharmar and colleagues developed a quality of care measure for pediatric patients in the ED, and such an instrument would be useful to evaluate the quality care received by children and youth with behavioural disorders in the ED. An instrument measuring the quality of care delivered to children and youth with behavioural disorders receiving care in the ED may help inform recommendations on the integration of information collected from children and youth and their families for treatment and disposition plans, and help standardized care for children and youth with behavioural

disorders between differently resourced (i.e., psychiatric services versus none) and specialized (i.e., general versus pediatric) EDs.

(4) Similar to future research recommendation (2) on understanding health care utilization, the exploration of how/whether existing community-based mental health services and primary health care providers (e.g., general practitioners, pediatricians) screen or assess for suicidal thoughts/behaviours and violent behaviours. Such research,, in turn, could lead to recommendations for improved screening and assessments, which may reduce the number of urgent crises that need to be addressed in the ED.

(5) Prospective studies are also needed to assess the period after the acute crisis and post-crisis follow-up care (e.g., services sought/received after the ED visit). This will help determine: (a) whether ED discharge recommendations were implemented and (b) the course of families (e.g., in the health care system, educational system, etc.). Similar to advantages of obtaining new knowledge of health care utilization and service gaps, such studies will also lend a perspective on how services are used, accessed, and perceived by families and help evaluate the appropriateness of follow up recommendations and their effectiveness. Recommendations based on these studies may target treatment and disposition planning in ED and to tailor follow up recommendations based on health care utilization patterns.

(6) Further exploration of wait times for care is needed to better understand the context for children and youth with behavioural disorders in the ED. This may be a prospective observational study examining ED occupancy and volume, staffing, and clinical urgency of other patients in the ED and wait times. Such a study may help better determine factors that influence wait times aside from triage level and make recommendations for early identification of patients who will require longer care and evaluation, thresholds of ED occupancy and volume and better understanding of staffing needs and ED flow.

(7) Addressing the continuity of care for children and youth in temporary care is important to understand medical resource use and health care utilization within this population. Exploring health care service use at the time of contact with social services and whether the child/youth remains in their homes or is apprehended and at time of change in caregiver(s) may help provide further insight on overall health and patterns/trends in health care utilization. Findings from these studies may help make recommendations regarding health care service use and ensure optimal care and health for children in care.

Personal Reflections

This project was my first medical record review study. I chose to master this methodology because I felt, as an allied health professional, I could apply this methodology to clinically relevant questions in my field. Although I knew little about medical record review studies prior to conducting my study; under the

guidance of my thesis supervisor, I was able to learn how to conduct a rigorous and clinically relevant review. I was also able to gain a greater appreciation for the strengths, limitations, and methodological issues surrounding medical record reviews after following published guidelines for emergency medicine record reviews (Gearing *et al.*, 2006, Gilbert *et al.*, 1996).

Prior to undergoing my own application for ethics approval, I had heard numerous stories about how long the process can be and how time consuming it can be to prepare the application. So once I had established a protocol for my Master's thesis project, I started the application. Luckily for me, I was able to fast track my application process since my project did not involve recruiting children and their families and collecting informed consent/assent. Obtaining ethics approval was not as 'painful' as I thought it would be and was quite delighted that it did not take too long.

Preparing my study protocol was not only a requirement for obtaining ethics approval, but a good exercise for me. I really enjoyed this process as it allowed me to thoroughly think about my study from start to finish, from research objectives to data abstraction to statistical analyses. Another process that I found helpful and was a good experience for me was shadowing an ED physician. I gained a better understanding of the flow of the ED and tested my data abstraction instrument on medical records.

One of the strengths of using medical record review methodology is that data have been previously collected, and this was appealing and feasible for designing my Master's Thesis project. Keeping in mind that information in a

medical record was originally documented for clinical use and not for research purposes, which can hinder the quality of data collected, per published guidelines (Gearing *et al.*, 2006, Gilbert *et al.*, 1996), I established a standardized template for data abstraction and a well defined approach for addressing missing data. These strategies helped improve consistency and accuracy during data collection.

Inter-rater reliability to measure the reliability of abstracted data is ideal; this metric assumes that two independent individuals abstracted data. I was the sole data abstractor for my study, and thus, I was worried that this would affect the reliability of the data abstracted. To address this project limitation, I randomly reviewed 10% of my abstracted data after three-four weeks after the original abstraction. I also went re-reviewed several medical records when conflicting data were found to check for the presence of inaccuracies. This was a very good process for me to go through. Through this process, I felt more confident in my data, which was important to me as the data were the foundation of my thesis project. Overall, my experience with data abstraction from medical records was very good. I learned how important it was to have a good data abstraction instrument on hand. I ended up moving variables in my data abstraction instrument based on the flow of the medical records for easier abstraction. Although time consuming, I thought data collection was the easiest part of this journey.

During my project, I was interested in examining the socioeconomic status (SES) of children and youth with behavioural disorders. While many factors affect SES that are not readily available in a medical record, for my study I

collected postal code data, which can serve as a proxy for SES when linked to Census data (household income) from Statistics Canada. During my project I learned the first three digits of the postal code translated into a Forward Sortation Area (FSA), which contained about 3500 to 5000 persons. I felt this FSA was too big geographically to appropriately estimate SES, and thus, I requested research ethics board approval to abstract the full six-digit postal code from the medical record to determine Dissemination Area (DA) as the geographical area. DA, which typically has a population of 400 to 700 persons, is the smallest area for which Canadian Census data are available. When the request was approved, I went back to the medical records for further data collection. I felt the collection of the full postal code was a better estimate of SES, and therefore worth the extra time. With the help of a data librarian, converting postal code data into DAs and determining median annual household income was a new and interesting process for me that I enjoyed doing.

Data analysis initially did not seem like a challenge to me because my analysis plan included only descriptive statistics, and chi square and Fisher's exact tests. I thought my initial data analysis was fairly simple and straightforward. However, as my results were compiled, there were many post hoc analyses that I needed to perform to provide another perspective to my results. I was glad to do these post hoc analyses as I felt they added another layer to my study results even though some of the analyses did have a steeper learning curve. I had to review my data and understand it was non-parametric to begin additional tests. This solidified my understanding of my data and the appropriate tests

performed. In addition, I learned the most important thing for conducting analyses was how data were organized and entered in the software. In fact, since I did not anticipate the post hoc analyses, and therefore my data were organized in such a way to reflect only the tests I did anticipate (descriptive analyses), it was a frustrating experience trying to re-organize my data. I have achieved a greater understanding of data management and non-parametric tests, and an appreciation for statistics in general.

CITED REFERENCES

Alessi-Severini, S., Biscontri, R. G., Collins, D. M., Sareen, J., & Enns, M. W. (2012). Ten years of antipsychotic prescribing to children: A Canadian population-based study. *Canadian Journal of Psychiatry, 57*(1), 52-58.

American Psychiatric Association. (1994). Diagnostic and statistical manual of mental disorders (4th ED.). Washington, DC:

Angold, A., Erkanli, A., Egger, H. L., & Costello, E. J. (2000). Stimulant treatment for children: A community perspective. *Journal of American Academy Child and Adolescent Psychiatry, 39*(8), 975-984.

Arkun, A., Briggs, W., Patel, S., Datillo, P., Bove, J., & Birkhahn, R. (2010). Emergency department crowding: Factors influencing flow. *Western Journal of Emergency Medicine, 11*(1), 10-15.

Atzema, C. L., Schull, M. J., Kurdyak, P., Menezes, N. M., Wilton, A. S., Vermeulen, M. J., et al. (2012). Wait times in the emergency department for patients with mental illness. *Canadian Medical Association Journal, 148*(18), e969-e976.

Barkley, R. A., Fischer, M., Edelbrock, C. S., & Smallish, L. (1990). The adolescent outcome of hyperactive children diagnosed by research criteria: An 8-year prospective follow up study. *Journal of the American Academy of Child & Adolescent Psychiatry, 29*(4), 546-557.

Ben-Yehuda, A., Aviram, S., Govezensky, J., Nitzan, U., Levkovitz, Y., & Bloch, Y. (2012). Suicidal behavior in minors – Diagnostic differences between children and adolescents. *Journal of Developmental & Behavioral Pediatrics, 33*(7), 542-547.

Biederman, J., Petty, C. R., O'Connor, K. B., Hyder, L. L., & Faraone, S. V. (2011). Predictors of persistence in girls with attention deficit hyperactivity disorder: Results from an 11-year controlled follow-up study. *Acta Psychiatrica Scandinavica, 125*(2), 147-156.

Boe, T., Overland, S., Lunderwvold, A. J., & Hysing, M. (2011). Socioeconomic status and children's mental health: Results from the Bergen child study. *Social Psychiatry and Psychiatric Epidemiology, E-print*, 1-10.

Boyle, M. H., & Lipman, E. L. (2002). Do places matter? Socioeconomic disadvantage and behavioral problems of children in Canada. *Journal of Consulting and Clinical Psychology, 70*(2), 378-389.

Brault, M., & Lacourse, E. (2012). Prevalence of prescribed attention-deficit hyperactivity disorder medications and diagnosis among Canadian preschoolers and school-age Children: 1994-2007. *The Canadian Journal of Psychiatry, 57*(2), 93-101.

Bussing, R., Zima, B. T., Gary, F. A., Mason, D. M., Leon, C. E., Sinha, K., et al. (2003). Social networks, caregiver strain and utilization of mental health

services among elementary school students at high risk for ADHD. *Journal of American Academy Child and Adolescent Psychiatry*, *42*(7), 842-850.

Canadian Association of Emergency Physicians Board. (2009). Position statement on emergency department overcrowding., 1-4.

Canadian Association of Paediatric Health Centres, The National Infant, C., Youth Mental Health Consortium Advisory, The Provincial Centre of Excellence for Child, & Youth Mental Health at CHEO. (Oct. 2010). *Access & wait times in child and youth mental health: A background paper*

Canadian Child Welfare Research Portal. (Last Updated, 2011). Alberta statistics. Retrieved Accessed, June 14, 2012 http://cwrp.ca/provinces-territories/alberta?quicktabs_1=0#quicktabs-1

Case, S. D., Case, B. G., Olfson, M., Linakis, J. G., & Laska, E. M. (2011). Length of stay of pediatric mental health emergency department visits in the United States. *Journal of the American Academy of Child & Adolescent Psychiatry*, *50*(11), 1110-1119.

Center for Disease Control and Prevention. (Last updated, 2010). Attention-deficit/Hyperactivity disorder (ADHD): Data and statistics. Retrieved Accessed, March 4, 2013 http://www.cdc.gov/ncbddd/adhd/data.html

Chacko, A., Wakschlag, L., Hill, C., Danis, B., & Espy, K. A. (2009). Viewing preschool disruptive behavior disorders and attention-deficit/hyperactivity

disorder through a developmental lens: What we know and what we need to know. *Child and Adolescent Psychiatric Clinics of North America, 18*(627), 643.

Chang, G., Weiss, A. P., Orav, E. J., Smallwood, J. A., Gonzalez, S., Kosowsky, J. M., et al. (2012). Bottlenecks in the emergency department: The psychiatric clinicians' perspective. *General Hospital Psychiatry, 34,* 403-409.

Chaput, Y., Paradis, M., Beaulieu, L., & Labonte, E. (2008). A qualitative study of a psychiatric emergency. *International Journal of Mental Health Systems, 2*(9), 1-9.

Christodulu, K. V., Lichenstein, R., Weist, M. D., Shafer, M. E., & Simone, M. (2002). Psychiatric emergencies in children. *Pediatrics Emergency Care, 18*(4), 268-270.

Cloutier, P., Kennedy, A., Maysenhoelder, H., Glennie, E. J., Cappelli, M., & Gray, C. (2010). Pediatric mental health concerns in the emergency department. *Pediatric Emergency Care, 26*(2), 99-106.

Copeland, V. C., & Synder, K. (2011). Barriers to mental health treatment services for low-income African American women whose children receive behavioral health services: An ethnographic investigation. *Social Work in Public Health, 26*(1), 78-95.

Davis, D. W., & Willaims, P. G. (2010). Attention Deficit/Hyperactivity disorder in preschool-age children: Issues and concerns. *Clinicial Pediatrics, 50*(2), 144-152.

Dempster, R. M., Wildman, B. G., Langkamp, D., & Duby, J. C. (2011). Pediatrician identification of child behaviour problems: The roles of parents factors and cross-practice differences. *Journal of Clinical Psychology in Medical Settings, E-print*, 177-187.

Dharmar, M., Marcin, J. P., Kuppermann, N., Andrada, E. R., Cole, S., Harvey, D. J., et al. (2007). A new implicit review instrument for measuring quality of care delivered to pediatric patients in the emergency department. *BMC Emergency Medicine, 7*(13), 1-8.

Duric, N., & Elgen, I. (2011). Characteristics of Norwegian children suffering from ADHD symptoms: ADHD and primary health care. *Psychiatry Research, 118*(3), 402-205.

Edelsohn, G. A., Braitman, L. E., Rabinovich, H., Sheves, P., & Melendex, A. (2003). Predictors of urgency in a pediatric psychiatric emergency service. *Journal of the American Academy of Child & Adolescent Psychiatry, 42*(10), 1197-1202.

Eggerston, L. (2005). Children's mental health services neglected: Kirby. *Canadian Medical Association Journal, 173*(5), 471.

Elkins, I. J., Malone, S., Keyes, M., Iacono, W. G., & McGue, M. (2011). The impact of attention-deficit hyperactivity disorder on preadolescent adjustment may be greater girls than for boys. *Journal of Clinical Child & Adolescent Psychology, 40*(4), 532-545.

Elo, S., & Kynga, S. H. (2008). The qualitative content analysis process. *Journal of Advanced Nursing, 62*(1), 107-115.

Faraone, S. V., Wilens, T. E., & Petty, C. (2007). Substance use among ADHD adults: Implications of late onset and sub threshold diagnoses. *The American Journal on Addictions, 16*(1), 24-34.

Farmer, E. M. Z., Burns, B. J., Chapman, M. V., Phillips, S. D., Angold, A., & Costello, E. J. (2001). Use of mental health services by youth in contact with social services. *The Social Service Review, 75*(605), 605-624.

French, W. P., & Kisicki, M. D. (2011). Management of disruptive behaviour disorders. *Pediatrics Annals, 40*(11), 563-568.

Galera, C., Melchior, M., Chastang, J. F., Bouvard, M. P., & Fombonne, E. (2009). Childhood and adolescent hyperactivity-inattention symptoms and academic achievement 8 years late: The GAZEL youth study. *Psychology Medicine, 39*(11), 1895-1906.

Gearing, R. E., Mian, I. A., Barber, J., & Ickowicz, A. (2006). A methodology for conducting retrospective chart review research in child and adolescent

psychiatry. *Journal of the Canadian Academy of Child and Adolescent Psychiatry, 15*(3), 126-134.

Ghanizadeh, A., & Mosallaei, S. (2009). Psychiatric disorders and behavioral problems in children and adolescents with Tourette syndrome. *Brain & Development, 31*(1), 15-19.

Gilbert, E. H., Lowenstein, S. R., Koziol-McLain, J., Barta, D. C., & Steiner, J. (1996). Chart reviews in emergency medicine research: Where are the methods? *Annals of Emergency Medicine, 27*(3), 305-308.

Gravel, J., Gouin, S., Goldman, R. D., Osmond, M. H., Fitzpatrick, E., Boutis, K., et al. (2012). The Canadian Triage and Acuity Scale for children: A prospective multicenter evaluation. *Annals of Emergency Medicine, 60*(1), 71-77.

Grupp-Phelan, J., Mahajan, P., & Foltin, G. L. (2009). Referral and resource use patterns for psychiatric-related visits to pediatric emergency departments. *Pediatric Emergency Care, 29*(4), 217-220.

Guevara, J. P., Rothbard, A., Shera, D., Zhoa, H., Forrest, C. B., Kelleher, K., et al. (2007). Correlates of behavioral care management strategies used by primary care pediatric providers. *Ambulatory Pediatrics, 7*(2), 160-166.

Harrison, M. E., McKay, M. M., & Bannon, W. M. J. (2004). Inner-city: Child mental health service use: The real question is why youth and families do not use services. *Community Mental Health Journal, 40*(2), 119-131.

Horesh, N., Gothelf, D., Ofek, H., Weizman, T., & Apter, A. (1999). Impulsivity as a correlate of suicidal behavior in adolescent psychiatric inpatients. *Crisis, 20*(1), 8-14.

Howlett, M. K., & Atkinson, P. R. (2011). A method for reviewing the accuracy and reliability of a five-level triage process (Canadian Triage and Acuity Scale) in a community emergency department setting: Building the crowding measurement infrastructure. *Emergency Medicine International, E-print*, 1-5.

Hsieh, H., & Shannon, S. (2005). Three appropaches to qualitative health research. *Qualative Health Research, 15*(9), 1277-1288.

Hutten-Czapski, P. (2010). Rural-urban differences in emergency department wait times. *Canadian Journal of Rural Medicine, 15*(4), 153-155.

Impey, M., & Heun, R. (2012). Completed suicide, ideation and attempt in attention deficit hyperactive disorder. *Acta Psychiatrica Scandinavica, 125*(2), 93-102.

Kasen, S., Cohen, P., & Chen, H. (2011). Developmental course of impulsivity and capability from age 10 to age 25 as related to trajectory of suicide

attempt in a community cohort. *Suicide and Life-Threatening Behavior, 41*(2), 180-192.

Kennedy, A., Cloutier, P., Glennie, E. J., & Gray, C. (2009). Establishing best practice in pediatric emergency mental health: A prospective study examining clinical characteristics. *Pediatric Emergency Care, 25*(6), 380-386.

Kerr, D. C. R., Washburn, J. J., Feingold, A., Kramer, A. C., Ivey, A. Z., & King, C., A. (2007). Sequelae of aggression in acutely suicidal adolescents. *Journal of Abnormal Child Psychology, 35*(5), 817-830.

Kirby, M. J. L., & Keon, W. J. (2004). Mental health, mental illness and addiction: Overview of policies and programs in Canada. Ottawa, Ontario, Canada: The standing senate committee on social affairs, science and technology.

Knapp, M., King, D., Healey, A., & Thomas, C. (2011). Economic outcomes in adulthood and their associations with antisocial conduct, attention deficit and anxiety problems in childhood. *Journal of Mental Health Policy and Economics, 14*(3), 137-147.

Landsverk, J., Burns, B. J., Stambaugh, L. F., & Rolls, J. A. (2009). Psychosocial interventions for children and adolescents in foster care: Review of research literature. *Child Welfare, 88*(1), 49-69.

Larkin, L., Claassen, C., Emond, J., Pelletier, A., & Camargo CA. (2005). Trends in US emergency department visits for mental health conditions, 1992 to 2001. *Psychiatry Services, 56*(6), 671-677.

Leslie, L. K., Hurlburt, M. S., James, S., & Landsverk, J. (2005). Relation between entry into child welfare and mental health service use. *Psychiatry Services, 56*(8), 981-987.

Mahajan, P., Alpern, E. R., Grupp-Phelan, J., Chamberlain, J., Dong, L., Holubkov, R., et al. (2009). Epidemiology of psychiatric-related visits to emergency departments in a multicenter collaborative research pediatric network. *Pediatrics Emergency Care, 25*(11), 715-720.

Mannuzza, S., & Klein, R. G. (2000). Long-term prognosis in attention-deficit/hyperactivity disorder. *Child and Adolescent Psychiatric Clinics of North America, 9*(8), 711-726.

Manor, I., Gutnik, I., Ben-Dor, D. H., Apter, A., Sever, J., Tyano, S., et al. (2010). Possible association between attention deficit hyperactivity disorder and attempted suicide in adolescents - A pilot study. *European Psychiatry, 25*(146), 150.

Merikangas, K. R., He, J., Burstein, M., Swanson, S. A., Avenevoli, S., Cui, L., et al. (2010). Lifetime prevalence of mental disorders in U.S. adolescents: Results from the national comorbidity survey replication–Adolescent

supplement (NCS-A). *Journal of the American Academy of Child & Adolescent Psychiatry, 49*(10), 980-989.

Miller, S., Malone, P. S., Dodge, K. A., & Conduct Problems Prevention Research Group. (2010). Developmental trajectories of boys' and girls' delinquency: Sex differences and links to later adolescent outcomes. *Journal of Abnormal Child Psychology, 38*(7), 1021-1032.

Monuteaux, M. C., Faraone, S. V., Gross, M. L., & Biederman, J. (2007). Predictors, clinical characteristics, and outcome of conduct disorder in girls with attention-deficit/hyperactivity disorder: A longitudinal study. *Psychology Medicine, 37*(12), 1731-1741.

Murray, J., & Farrington, D. P. (2010). Risk factors for conduct disorder and delinquency: Key findings from longitudinal studies. *The Canadian Journal of Psychiatry, 55*(10), 633-642.

Nelson, K. A., Boslaugh, S. E., & Hodge, D. (2009). Risk factors for extremely long length-of-stay among pediatric emergency patients. *Pediatric Emergency Care, 25*(12), 835-840.

Newton, A. S., Ali, S., Hamm, M. P., Haines, C., Rosychuk, R. J., Warron, L., et al. (2011a). Exploring differences in the clinical management of pediatric mental health in the emergency department. *Pediatric Emergency Care, 27*(4), 275-283.

Newton, A. S., Ali, S., Johnson, D. W., Haines, C., Rosychuk, R. J., Keaschuk, R. A., et al. (2010). Who comes back? Characteristics and predictors of return to emergency department services for pediatric mental health care. *Academic Emergency Medicine, 17,* 177-186.

Newton, A. S., Ali, S., Johnson, D. W., Haines, C., Rosychuk, R. J., Keaschuk, R. A., et al. (2009). A 4-year review of pediatric mental health emergencies in Alberta. *Canadian Journal of Emergency Medical Care, 11*(5), 447-454.

Newton, A. S., Rosychuk, R. J., Ali, S., Cawthrope, D., Curran, J., Dong, K., et al. (2011b). The emergency department compass: Children's mental health. pediatric mental health emergencies in Alberta, Canada: Emergency department visits by children and youth aged 0 to 17 years, 2002-2008.

O'Malley, K. D., & Nanson, J. (2002). Clinical implications of a link between fetal alcohol spectrum disorder and attention-deficit hyperactivity disorder. *Canadian Journal of Psychiatry, 47*(4), 349-354.

Pardini, D. A., & Fite, P. J. (2010). Symptoms of conduct disorder, oppositional defiant disorder, attention deficit/hyperactivity disorder, and callous-unemotional traits as unique predictors of psychosocial maladjustment in boys: Advancing an evidence base for *DSM-V. Journal of the American Academy of Child & Adolescent Psychiatry, 49*(11), 1134-1144.

Peadon, E., & Elliott, E. J. (2010). Distinguishing between attention-deficit hyperactivity and fetal alcohol spectrum disorders in children: Clinical guidelines. *Neuropsychiatric Disease and Treatment, 6*(1), 509-515.

Persi, J., & Sisson, M. (2008). Children in foster care: Before, during and after psychiatric hospitalization. *Child Welfare, 87*(4), 79-99.

Reder, S., & Quan, L. (2004). Emergency mental health care for youth in Washington state: Qualitative research addressing hospital emergency departments; identification and referral of youth facing mental health issues. *Pediatric Emergency Care, 20*(11), 742-748.

Reid, G. J., & Brown, J. B. (2008). Money, case complexity, and wait lists: Perspectives on problems and solutions at children's mental health centers in Ontario. *Journal of Behavioral Health Services & Research, 35*(3), 334-346.

Rhodes, A. E., Boylee, M. H., Bethella, J., Wekerlef, C., Goodman, D., Tonmyri, L., et al. (2012). Child maltreatment and onset of emergency department presentations for suicide-related behaviors. *Child Abuse and Neglect, 36*(6), 542-551.

Richards, M. E., Hubble, M. W., & Crandall, C. (2006). Influence of ambulance arrival on emergency department time to be seen. *Prehospital Emergency Care, 10*(4), 440-446.

Rushton, J. L., Fant, K. E., & Clark, S. J. (2004). Guidelines in the primary care of children with attention-Deficit/Hyperactivity disorder. *Pediatrics, 114*(1), 23-28.

Santiago, L. I., Tunik, M. G., Foltin, G. L., & Mojica, M. A. (2006). Children requiring psychiatric consultation in the pediatric emergency department epidemiology, resource utilization, and complications. *Pediatric Emergency Care, 22*(2), 85-89.

Sayal, K., Tischler, V., Coope, C., Robotham, S., Ashworth, M., Day, C., et al. (2010). Parental help seeking in primary care for child and adolescent mental health concerns: Qualitative study. *The British Journal of Psychiatry, 197*, 476-481.

Schonberg, M. A., & Shaw, D. S. (2007). Risk factors for boy's conduct problems in poor and lower-middle-class neighborhoods. *Journal of Abnormal Child Psychology, 35*(5), 759-772.

Searight, H. R., Rottnek, R., & Abby, S. L. (2001). Conduct disorder: Diagnosis and treatment in primary care. *American Family Physician, 63*(8), 1579-1588.

Sills, M. R., & Bland, S. D. (2010). Summary statistics for pediatric psychiatric visits to US emergency departments, 1993-1999. *Pediatrics, 110*(4), 40-45.

Smith, R. P., Larkin, G. L., & Southwick, S. M. (2008). Trends in U.S. emergency department visits for anxiety-related mental health conditions, 1992-2001**.** *The Journal of Clinical Psychiatry, 69*(2), 286-294.

Soleimani, M., Grewal, S., Rosychuk, R. J., & Newton, A. S. (2012). How much longer? A study of emergency department wait and treatment times for children with mental health visits. Unpublished manuscript.

Sourander, A., Klomek, A. B., Niemela, S., Haavisto, A., Gyllenberg, D., Helenius, H., et al. (2009). Childhood predictors of completed and severe suicide attempts. *Archives of General Psychiatry, 66*(4), 398-406.

Srebnicki, T., Kolakowski, A., & Wolcanzyk, T. (2012). Adolescent outcome of child ADHD in primary care setting: Stability of diagnosis. *Journal of Attention Disorders, E-print*, 1-6.

Taggart, L., Taylor, D., & McCrum-Gardner, E. (2010). Individual, life events, family and socio-economic factors associated with young people with intellectual disability and with and without behavioural/emotional problems. *Journal of Intellectual Disabilities, 14*(4), 267-288.

Tobler, A. L., Komro, K. A., Dabroski, A., Aveyard, P., & Markham, W. A. (2011). Preventing the link between SES and high-risk behaviors: "value-added" education, drug use and delinquency in high-risk, urban schools. *Prevention Science: The Official Journal of the Society for Prevention Research, 12*(2), 211-221.

Torok, M., Darke, S., & Kaye, S. (2012). Predisposed violent drug users versus drug users who commit violence: Does the order of onset translate to differences in the severity of violent offending? *Drug and Alcohol Review, 31*(4), 558-565.

Tung, I., Li, J. J., & Lee, S. S. (2012). Child sex moderates the association between negative parenting and childhood conduct problems. *Aggressive Behavioral, 38*(3), 239-351.

Van Oort, F. V. A., Van der Ender, J., Wadsworth, M. E., Verhulst, F. C., & Achenbach, T. M. (2011). Cross-national comparison of the link between socioeconomic status and emotional and behavioral problems in youths. *Social Psychiatry and Psychiatric Epidemiology, 46*(2), 167-172.

Vazonyi, A. T., & Chen, P. (2010). Entry risk into the juvenile justice system: African American, American Indian, Asian American, European American, and Hispanic children and adolescents. *Journal of Child Psychology and Psychiatry, 51*(6), 668-678.

Waddell, C., McEwan, K., Peters, R. D., Hua, J. M., & Garland, O. (2007). Preventing mental disorders in children: A public health priority. *Canadian Journal of Public Health, 98*(3), 174-178.

Waseem, M., Prasankumar, R., Pagan, K., & Leber, M. (2011). A retrospective look at length of stay for pediatric psychiatric patients in an urban emergency department. *Pediatric Emergency Care, 27*(3), 170-173.

Webster-Stratton, C., & Reid, M. J. (2003). The incredible years parents, teachers and children training series: A multifaceted treatment approach for young children with conduct problems. In A. E. Kazdin, & J. R. Weisz (Eds.), *Evidence-based psychotherapies for children and adolescents* (pp. 224-240). New York: Guilford Press.

Wilper, A. P., Woolhandler, S., Lasser, K. E., McCormick, D., Cutrona, S. L., Bor, D. H., et al. (2008). Waits to see an emergency department physician: U.S. trends and predictors, 1997 -2004. *Health Affairs, 27*(2), 84-95.

Woods, S. B., Farineau, H. M., & McWey, L. M. (2012). Physical health, mental health, and behaviour problems among early adolescents in foster care. *Child: Care, Health and Development, E-print*, 1-8.

Woolfenden, S., Richie, J., Hanson, R., & Nossar, V. (2000). Parental use of a paediatric emergency department as an ambulatory care service. *Australian and New Zealand Journal of Public Health, 24*(2), 204-206.

Worster, A., & Haines, T. (2004). Advanced statistics: Understanding medical record review (MRR) studies. *Academic Emergency Medicine, 11*(2), 188-192.

Yoon, P., Steiner, I., & Reinhardt, G. (2003). Analysis of factors influencing length of stay. *Canadian Journal of Emergency Medicine, 5*(3), 155-161.

Yu, A. Y., Rosychuk, R. J., & Newton, A. S. (2011). Clinical acuity of repeat pediatric mental health presentations to the emergency department. *Journal of the Canadian Academy of Child and Adolescent Psychiatry, 20*(3), 208-213.

Zahn-Waxler, C., Park, J. H., Usher, B., Belouad, F., Cole, P., & Gruber, R. (2008a). Young children's representations of conflict and distress: A longitudinal study of boys and girls with disruptive behavior problems. *Development and Psychopathology, 20*, 99-119.

Zahn-Waxler, C., Shirtcliff, E. A., & Marceau, K. (2008b). Disorders of childhood and adolescence: Gender and psychopathology. *Annual Review of Clinical Psychology, 4*, 275-303.

Zuvekas, S. H., & Vitello, B. (2012). Stimulant medication use in children: A 12-year perspective. *American Journal of Psychiatry, 169*(2), 160-166.

Zwirs, B. W., Burger, H., Schulpen, T. W., Wiznitzer, M., Fedder, H., & Buitelaar, J. K. (2007). Prevalence of psychiatric disorders among children of different ethnic origin. *Journal of Abnormal Child Psychology, 35*(4), 556-566.

Appendix I

Pediatric Emergency Department Visits with a Mental Health Diagnosis

January 1, 2009 – December 31, 2011

Year	Total Pediatric ED Visits	Total Pediatric ED Visits with a Mental Health (MH) Diagnosis	Percentage of Pediatric MH visits from all Pediatric ED visits
2009	4696	839	17.9%
2010	4628	892	19.3%
2011	5201	976	18.8%
AVERAGE	**4842**	**902**	**18.6%**

Mental Health Diagnosis Criteria:
DX Code 1-2 = F20-25, F28-29, F30-34, F38-39, F40-43, F50, F55, F59, F10-19, T51-52, T58-59, T71 or X60-84

DX Code 3-10 = T71 or X60-84

Appendix II

Documented Psychiatric and Non-Psychiatric Medications

Selective serotonin re-uptake inhibitors (SSRI)
Celexa, Cipramil
Elavil
Lexapro
Luvox
Paxil
Prozac, Sarafem, Fontex
Strattera
Zoloft, Lustral

Antipsychotic
Abilify
Invega
Levoprome
Neuleptil
Prolixin
Risperdal
Seroquel
Zyprexa

Anticonvulsant
Gabapentin
Lamitcol
Tegretol
Topamax
Valporic acid, Epival

Psychostimulant
Adderal
Concerta, Methylin, Ritalin
Dexedrine

Tricyclic antidepressant
Anafranil
Doxepin
Norpramin, Pertofane

Benzodiazepine
Ativan
Klonopin

Other psychiatric medications
Catapres/Clonidine (alpha-2 (α_2) adrenergic receptor)
Effexor (serotonin norepinphrine re-uptake inhibitor (SNRI)
Remeron (Noradrenergic and specific serotonergic antidepressants)
Revia (opiod receptor antagonist)
Tenex (alpha-2A adrenergic receptor)
Wellbutrin (norepinephrine domaine re-uptake inhibitor (NDRI))

Other medications
Advair
Aerius
Altace
Calmsforte
Celestone
Colace
Dicetel
Imovane
Insulin
keflex
Lactulose
Melatonin
Qvar
Salbutamol, Ventolin
Symbicort

Appendix III

Behavioural and emotional disorders with onset usually occurring in childhood and adolescence (F90-F92)

F90 Hyperkinetic disorders

A group of disorders characterized by an early onset (usually in the first five years of life), lack of persistence in activities that require cognitive involvement, and a tendency to move from one activity to another without completing any one, together with disorganized, ill-regulated, and excessive activity. Several other abnormalities may be associated. Hyperkinetic children are often reckless and impulsive, prone to accidents, and find themselves in disciplinary trouble because of unthinking breaches of rules rather than deliberate defiance. Their relationships with adults are often socially disinhibited, with a lack of normal caution and reserve. They are unpopular with other children and may become isolated. Impairment of cognitive functions is common, and specific delays in motor and language development are disproportionately frequent. Secondary complications include dissocial behaviour and low self-esteem.

Excludes: anxiety disorders (F41.-)
mood [affective] disorders (F30-F39)
pervasive developmental disorders (F84.-)
schizophrenia (F20.-)

F90.0 Disturbance of activity and attention

Attention deficit:
· disorder with hyperactivity
· hyperactivity disorder
· syndrome with hyperactivity

Excludes: hyperkinetic disorder associated with conduct disorder (F90.1)

F90.1 Hyperkinetic conduct disorder

Hyperkinetic disorder associated with conduct disorder

F90.8 Other hyperkinetic disorders

F90.9 Hyperkinetic disorder, unspecified

Hyperkinetic reaction of childhood or adolescence NOS
Hyperkinetic syndrome NOS

F91 Conduct disorders

Disorders characterized by a repetitive and persistent pattern of dissocial, aggressive, or defiant conduct. Such behaviour should amount to major violations of age-appropriate social expectations; it should

therefore be more severe than ordinary childish mischief or adolescent rebelliousness and should imply an enduring pattern of behaviour (six months or longer). Features of conduct disorder can also be symptomatic of other psychiatric conditions, in which case the underlying diagnosis should be preferred.
Examples of the behaviours on which the diagnosis is based include excessive levels of fighting or bullying, cruelty to other people or animals, severe destructiveness to property, fire-setting, stealing, repeated lying, truancy from school and running away from home, unusually frequent and severe temper tantrums, and disobedience. Any one of these behaviours, if marked, is sufficient for the diagnosis, but isolated dissocial acts are not.

Excludes: mood [affective] (F30-F39)
pervasive developmental disorders (F84.-)
schizophrenia (F20.-)
when associated with:
· emotional disorders (F92.-)
· hyperkinetic disorders (F90.1)

F91.0 Conduct disorder confined to the family context

Conduct disorder involving dissocial or aggressive behaviour (and not merely oppositional, defiant, disruptive behaviour), in which the abnormal behaviour is entirely, or almost entirely, confined to the home and to interactions with members of the nuclear family or immediate household. The disorder requires that the overall criteria for F91.- be met; even severely disturbed parent-child relationships are not of themselves sufficient for diagnosis.

F91.1 Unsocialized conduct disorder

Disorder characterized by the combination of persistent dissocial or aggressive behaviour (meeting the overall criteria for F91.- and not merely comprising oppositional, defiant, disruptive behaviour) with significant pervasive abnormalities in the individual's relationships with other children.

Conduct disorder, solitary aggressive type
Unsocialized aggressive disorder

F91.2 Socialized conduct disorder

Disorder involving persistent dissocial or aggressive behaviour (meeting the overall criteria for F91.- and not merely comprising oppositional, defiant, disruptive behaviour) occurring in individuals who are generally well integrated into their peer group.

Conduct disorder, group type
Group delinquency
Offences in the context of gang membership
Stealing in company with others
Truancy from school

F91.3 Oppositional defiant disorder

Conduct disorder, usually occurring in younger children, primarily characterized by markedly defiant, disobedient, disruptive behaviour that does not include delinquent acts or the more extreme forms of aggressive or dissocial behaviour. The disorder requires that the overall criteria for F91.- be met; even severely mischievous or naughty behaviour is not in itself sufficient for diagnosis. Caution should be employed before using this category, especially with older children, because clinically significant conduct disorder will usually be accompanied by dissocial or aggressive behaviour that goes beyond mere defiance, disobedience, or disruptiveness.

F91.8 Other conduct disorders

F91.9 Conduct disorder, unspecified

Childhood:
· behavioural disorder NOS
· conduct disorder NOS

F92 Mixed disorders of conduct and emotions

A group of disorders characterized by the combination of persistently aggressive, dissocial or defiant behaviour with overt and marked symptoms of depression, anxiety or other emotional upsets. The criteria for both conduct disorders of childhood (F9l.-) and emotional disorders of childhood (F93.-) or an adult-type neurotic diagnosis (F40-F48) or a mood disorder (F30-F39) must be met.

F92.0 Depressive conduct disorder

This category requires the combination of conduct disorder (F91.-) with persistent and marked depression of mood (F32.-), as demonstrated by symptoms such as excessive misery, loss of interest and pleasure in usual activities, self-blame, and hopelessness; disturbances of sleep or appetite may also be present.

Conduct disorder in F91.- associated with depressive disorder in F32.-

F92.8 Other mixed disorders of conduct and emotions

This category requires the combination of conduct disorder (F91.-) with persistent and marked emotional symptoms such as anxiety, obsessions or compulsions, depersonalization or derealization, phobias, or hypochondriasis.

Conduct disorder in F91.- associated with:
· emotional disorder in F93.-
· neurotic disorder in F40-F48

F92.9 Mixed disorder of conduct and emotions, unspecified

(Source: Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition)

Appendix IV

Research Objectives and Hypotheses

1. To describe the sociodemographic characteristics of children and youth, aged 10 to 17 years, presenting with behavioural disorder in an urban, tertiary care Emergency Department (ED).

Hypothesis: The majority of children and youth will be male, come from low SES neighbourhoods, have medical co-morbidities and will be taking medications for their behavioural disorder.

a. To describe demographic differences between children and youth treated for disorders of hyperkinetic, conduct and mixed disorders of conduct and emotions.

   Hypotheses: There will be no significant gender or SES differences between children and youth treated for disorders of hyperkinetic, conduct and mixed disorders of conduct and emotions. Children with a diagnosis of a hyperkinetic disorder (ADHD) will be younger compared to children with conduct disorders and mixed disorders of conduct and emotions.

b. To determine the prevalence of children and youth with social service involvement who visit the ED with behavioural disorders.

   Hypothesis: The prevalence of children and youth with social service involvement will be more than 50%.

      i. To describe the events leading to the ED visit for this subpopulation.

         Hypothesis: The majority of the events leading to the ED visit will be related to violence/aggression.

c. To determine the prevalence of children and youth with low SES who visit the ED with behavioural disorders.

   Hypothesis: The prevalence of children and youth with low SES who visit the ED with behavioural disorders will exceed majority (greater than 50% of children and youth).

      i. To describe the events leading to the ED within this subpopulation.

         Hypothesis: The majority of the events leading to the ED visit will be related to violence/aggression.

2. To describe the characteristics of health care visits for children and youth, aged 10 to 17 years, presenting with behavioural disorders in an urban, tertiary care ED.

a. To describe the primary complaints for the ED visit.

   Hypothesis: The majority (greater than 50%) of primary complaints will be violence or aggression related.

b. To describe common themes/events leading up to the ED visit.

   Hypothesis: The most common (greater than 50%) themes/events leading up to the ED visit will be violence or aggression related.

c. To determine the clinical urgency of ED presentations for behavioural disorders.

   Hypothesis: Using the triage (CTAS) level (1-5, 1 being resuscitation, and 5 being non-urgent), presentations to the ED for a behavioural disorder will be triaged as semi-urgent (Level 4) in more than 50% of cases.

d. To determine wait times for children and youth with presentations for behavioural disorders in the ED.
   (i) To calculate how long children and youth with presentations for behavioural disorders wait to be seen by a physician.
   (ii) To calculate how long children and youth with presentations for behavioural disorders wait to be seen by a registered nurse.
   (iii) To calculate how long children and youth with presentations for behavioural disorders wait to receive mental health consultation services.

   Hypotheses: The shortest wait times for children and youth regwith presentations for a behavioural disorder in the ED will be from time of triage to the time seen by a registered nurse. The longest wait times will be from time of triage to the time of a mental health consult.

e. To determine the length of stay for children and youth with presentations for behavioural disorders in the ED.

   Hypothesis: The length of stay for children and youth with presentations for behavioural disorders in the ED will be > 1hr.

f. To describe the treatments provided, assessments conducted, follow-up arranged, and discharge planning for children and youth with presentations for behavioural disorders in the ED.

Hypotheses: The most common treatments provided for children and youth with presentations for behavioural will be no treatment, or crisis intervention. Together, they will make up greater than 50% of cases. Counseling treatment will be provided in less than 50% of cases. The majority (greater than 50%) of children and youth will have a mental health consultation and have follow up plans with outpatient psychiatry programs. The majority of children and youth will be discharged.

Appendix V

Data Abstraction Instrument

Case Specific Data Coding System	
Case Number:	
Date of presentation (dd/mm/yyyy)	❑ Enter 'as is'
Date of discharge (dd/mm/yyyy)	❑ Enter 'as is'
Time registered in ED	❑ Enter 'as is' (24h clock)
Triage time	❑ Enter 'as is' (24h clock)
Time seen by physician	❑ Enter 'as is' (24h clock)
Time seen by nurse	❑ Enter 'as is' (24h clock)
Time seen by mental health crisis team	❑ Enter 'as is' (24h clock) (0) Not seen by crisis team (99) Unable to determine
SOCIODEMOGRAPHICS	
Birth Date (dd/mm/yyyy)	❑ Enter 'as is'
Age at presentation (years)	(1) 10-12 (2) 13-17
Gender	(1) Male (2) Female (99) Missing
Full Postal Code	❑ Enter 'as is'
Patient's current medications	❑ Enter 'as is'
Psych Meds	(1) None (2) Yes (99) Missing
Other Meds	(1) None (2) Yes (99) Missing
Psychiatric Co-morbidity	1) None 2) Yes

Other Co-morbidity	(1) Congenital Disorder (2) Global Developmental Delay (3) Language/Speech Delay (4) Respiratory Problem (5) Medical Condition (epilepsy, seizures) (6) History of self-harm (7) History of substance abuse (8) Other *(recorder to specify)* (9) None (99) Missing (00) Unable to determine
Specific Diagnoses	(1) Attention Deficit Hyperactivity Disorder (2) Oppositional Defiant Disorder (3) Conduct Disorder (4) Bipolar Disorder (5) Anxiety Disorder (6) Depression (7) Fetal Alcohol Syndrome (8) Autism/Asperger's Syndrome (9) Tourette's Syndrome (10) Mood Disorder (11) Reactive Attachment Disorder (12) Post Traumatic Stress Disorder (13) Schizophrenia
Social Services	(1) None documented (2) Group home (3) Foster home (4) Adopted home (5) Other *(recorder to specify)*
Medical Resources	(1) Family Physician/Pediatrician (2) Psychiatrist (3) Psychologist (4) Other *(recorder to specify)* (8) None (99) Missing (00) Unable to determine

HEALTH CARE VISIT INFORMATION	
Main Ambulatory ICD-10-CA Code	❑ Enter code 'as is' (99) Missing
Triage (CTAS) level	(1) Resuscitation (2) Emergency (3) Urgent (4) Semi-urgent (5) Non-urgent (99) Missing
Patient arrived to ED with:	(1) Family member (parent, grandparent, legal age sibling) (2) Friend (3) Medical Personnel (4) Social Services (5) Police (6) Alone (8) Other *(recorder to specify ie. police, social services)* (99) Missing
Mode of Arrival	(1) Walk-in (2) EMS/Ambulance (3) Police (4) Alone (5) Other *(recorder to specify)* (99) Missing
Time per ED visit (Total hours between registration time and discharge/transfer time)	Enter in minutes
Length of Stay (LOS) (Time between triage and discharge/transfer time)	Enter in minutes
Chief Complaint	(1) Depression, suicidal, deliberate self harm (2) Pediatric Disruptive Behaviour (3) Bizarre Behaviour (4) Violent/Homicidal Behaviour (5) Anxiety/Situational Crisis (6) Moderate Anxiety/Agitation with Paranoia (7) Overdose Injestion (8) Other *(recorder to specify)*
History of Events	Enter Verbatim from clinical notes

Laboratory Testing and Imaging	(1) Blood work (2) Toxicology Screen (3) CT scan/MRI (4) X-ray (5) Ultrasound (6) Other *(recorder to specify)* (8 None performed (99) Missing (00) Unable to determine
Consultative Services	(1) Child Psychiatry (2) Regional Children's Mental Health – Mobile Crisis Services (3) Social Work (4) Child Welfare Services (5) Police interviews/consult (6) Medical Specialty *(recorder to specify)* (7) Other *(recorder to specify)* (8) None (99) Missing (00) Unable to determine
Clinical assessments	(1) Physical examination (2) Mood (Depression & Anxiety) assessment (3) Suicidality assessment (4) Homicidality assessment (5) Other *(recorder to specify)* (8) None (99) Missing (00) Unable to determine
Clinical interventions	(1) Brief counseling (2) Family counseling (3 Crisis intervention (including pharmacological) (4)Other *(recorder to specify)* (8) None (99) Missing (00) Unable to determine

Recommended follow-up plan	(1) Crisis Team/Crisis Worker (2) Outpatient psychiatry program (3) Health Care Professional (i.e.GP and/or pediatrician, Psychiatrist, Psychologist) (6) Child welfare/child services (7) Other *(recorder to specify)* (8) None (99) Missing (00) Unable to determine
Discharge disposition	(1) As mature minor, On own (2) Family home (3) Group home (4) Child & Family Services (5) Rehabilitation (6) Youth Emergency Shelter (7) Admission to psychiatric in-patient unit (8) Admission to medical unit (9) Other *(recorder to specify)* (99) Missing (00) Unable to determine