



Emergency Department as a First Contact for Mental Health Problems in Children and Youth

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Objective: To characterize youth who use the emergency department (ED) as a “first contact” for mental health (MH) problems.

Method: This was a population-based cross-sectional cohort study using linked health and demographic administrative datasets of youth 10 to 24 years of age with an incident MH ED visit from April 1, 2010, to March 31, 2014, in Ontario, Canada. We modeled the association of demographic, clinical, and health service use characteristics with having no prior outpatient MH care in the preceding 2-year period (“first contact”) using modified Poisson models.

Results: Among 118,851 youth with an incident mental health ED visit, 14.0% were admitted. More than half (53.5%) had no prior outpatient MH care, and this was associated with younger age (14–17 versus 22–24 years old: risk ratio [RR] = 1.09, 95% CI = 1.07–1.10), rural residence (RR = 1.16, 95% CI = 1.14–1.18), lowest versus

highest income quintile (RR = 1.04, 95% CI = 1.03–1.06), and refugee immigrants (RR = 1.17, 95% CI = 1.13–1.21) and other immigrants (RR = 1.10, 95% CI = 1.08–1.13) versus nonimmigrants. The 5.1% of the cohort without a usual provider of primary care had the highest risk of first contact (RR = 1.78, 95% CI = 1.77–1.80). A history of low-acuity ED use and individuals whose primary care physicians were in the lowest tertile for mental health visit volumes were associated with higher risk.

Conclusion: More than half of youth requiring ED care had not previously sought outpatient MH care. Associations with multiple markers of primary care access characteristics suggest that timely primary care could prevent some of these visits.

Key words: first contact, mental health services, emergency department, primary care, access

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Mental health (MH) conditions are an important cause of morbidity in children and youth.^{1,2} One in five children have an MH condition, yet less than 20% of affected children receive adequate services.^{3,4} In North America, up to 3% of all pediatric emergency department (ED) visits^{5–7} and 10% of all hospital admissions are MH related.⁸ While the overall prevalence of MH conditions in youth has remained relatively stable,⁹ the rates of health service use, ED visits, and hospital admissions are increasing.^{6,10,11}

Up to half of children and youth who present to the ED have no previous psychiatric history or contact with the MH care system.^{12,13} These ED visits for MH-related concerns without prior MH care contact have been described as “first contact” ED visits.¹⁴ First contact ED visits have been used as a health system performance indicator measuring access to MH care.¹⁴ Although emergency services are important for

managing MH crises, the rise in ED visits observed in children and youth and the high rate of first contact suggests that access to timely outpatient MH care is an important issue.^{10,14} In adults, individuals with first-contact ED visits for psychosis have poor clinical outcomes, such as more severe disease at presentation and higher future use of acute-care services,¹⁵ but less is known about the phenomenon of first contact ED visits in youth and for other MH problems. First contact may be due to a failure by families to recognize MH conditions before crisis,^{12,16} parental request for urgent or timely diagnostic evaluation,¹² lack of access or knowledge about how to access services, reluctance to discuss concerns with a primary care physician,¹⁷ or reduced proficiency in English.¹⁸ Ethnicity and socioeconomic status are associated with increased use of ED services for MH conditions,^{4,5,19–21} but it is unclear whether these are also risk factors for first contact. Finally, certain MH conditions may present acutely (e.g., alcohol intoxication), and first contact may be unavoidable.

Elucidating risk factors for first contact ED visits in children and youth is important to understand whether EDs are being used for MH problems due to outpatient access issues and to better align emergency services with need. Therefore, the aims of this study are to describe demographic, clinical, and primary care provider characteristics of children and youth with first-time ED visits for MH



This article is discussed in an editorial by Dr. Jennifer F. Havens on page 458.



Clinical guidance is available at the end of this article.



An interview with the author is available by podcast at www.jaacap.org or by scanning the QR code to the right.



Supplemental material cited in this article is available online.



problems, and to test the associations of these characteristics with whether there was previous outpatient care for MH problems in a population-based cross-sectional study from Ontario, whose population of 13 million represents 40% of the Canadian population.

METHOD

Study Design and Setting

This was a population-based, cross-sectional study of a cohort of youth presenting to an ED in Ontario, Canada, using data available through a research agreement with the Ontario Ministry of Health and Long-Term Care and the Institute for Clinical Evaluative Sciences (ICES). In Ontario, most hospital and physician services are funded through the single payer Ontario Health Insurance Plan (OHIP). Research ethics board approval was obtained from The Hospital for Sick Children and Sunnybrook Health Sciences Centre in Toronto, Ontario.

Data Sources

A number of linked health administrative and demographic datasets available at ICES were used for study data. ICES data holdings link individual patient records from health care services including ED visits, inpatient hospitalizations, and outpatient visits using encoded identifiers. The National Ambulatory Care Reporting System (NACRS) was used to identify MH-related ED visits according to discharge diagnosis (*International Classification of Diseases [ICD] 10th Revision* codes).²² The Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD) and the Ontario Mental Health Reporting System (for designated mental health hospital beds) were used to evaluate clinical information for patients with MH-related hospital admissions.²³ The OHIP claims database contains information on outpatient billings by physicians in Ontario and was used to determine MH-related outpatient visits, primary care use, and provider characteristics. The Client Agency Program Enrolment (CAPE) database was used to describe patient enrollment with primary care groups and patient enrollment models. The ICES Physician Database (IPDB) provided information about physician characteristics.

The Ontario Registered Persons Database (RPDB) was used to identify postal code of residence, which was linked to 2006 Canadian Census data to obtain neighborhood income quintile data at the level of a dissemination area (400–700 persons). The Ontario portion of the federally maintained Immigration, Refugees and Citizenship Canada's Permanent Resident Data System (PRDS) was used to characterize those who were immigrants and refugees up until March 31, 2012. All patient data are deterministically linked by an encoded health insurance number. Probabilistic linkage of the immigrant dataset and the RPDB is 86% and has been described in detail elsewhere.²⁴

Study Population

The study included all youth 10 to 24 years of age who were living in Ontario and who had an unscheduled incident ED visit for an MH condition (*ICD-10* codes F04-F99, X60-84, Y10-Y19 or Y28) from April 1, 2010, to March 31, 2014. An incident ED visit was defined as an ED visit for an MH disorder without a prior MH-related ED visit or hospitalization in the 2 preceding years. This exclusion was made to restrict our population to those with a first or new emergency MH crisis. Duplicated, overlapping, and transferred ED visits were excluded. Records of non-Ontario residents, or those with a missing or invalid health card number, age, or sex

were excluded. Children and youth whose primary care is delivered in a community health centre for which there are no administrative records of visits available, those with less than 2 years of OHIP eligibility prior to the index event, and those whose usual provider of primary care (UPC) speciality was missing were also excluded.

Outcome

The primary outcome was a mental health ED visit without prior outpatient physician care for MH problems ("first contact visit"), operationalized as one or more outpatient visits for an MH-related disorder to a primary care provider (i.e., general practitioner/family physician [GP/FP], or pediatrician) or any visit to a psychiatrist in the 2 years preceding the incident ED visit. We used an algorithm to define MH visits that was validated in adults and modified for children.²⁵ The algorithm uses physician billing data to define an MH visit as an outpatient visit claim with an MH diagnostic code.

Predictors

A number of variables that, based on the literature or clinical plausibility, are potentially associated with MH disorders or access to MH care were included. Age, sex, socioeconomic status (neighborhood income quintiles), and rural residence were included as covariates, given their known association with access to MH care.^{1,11} The Rurality Index of Ontario (RIO) score was used to determine whether patients lived in urban (RIO <39) or rural (RIO ≥40) areas.²⁶ Mental health morbidity and service use vary by immigration status^{1,27} and were assessed using two main variables: immigration status (nonimmigrant, immigrant nonrefugee, and immigrant refugee); and time since arriving in Canada, defined as number of years from landing in Canada to incident ED visit (recent = 0 to ≤5 years, intermediate = >5 years and ≤10 years, and long-term = >10 years).^{28,29}

All-cause ED visits has been used as a marker of overall adult health needs,³⁰ whereas all low-acuity ED visits, or the tendency to use emergency services for less urgent causes, has been shown to reflect primary care access.³¹ Both all-cause ED visits and all low-acuity ED visits for children and youth in the 2 years prior to the incident ED visit were measured and categorized as none, 1, 2, or ≥3 ED visits. To determine the frequency of outpatient primary care health service use before first contact, visits to a primary care provider in the 2 years before the ED visit were assessed and divided into tertiles. For youth with a prior outpatient MH visit, the number of visits to a psychiatrist in the 2 years before the ED visit was described.

In Ontario, significant reform to primary care delivery has occurred with the creation of several primary care models³² to improve patient access with financial incentives to provide after-hours care.³³ Those GP/FPs who are not enrolled in a model are remunerated by fee-for-service (FFS). Pediatricians provide some primary care but have not been included in primary care reform; they are remunerated by FFS and have no requirement to provide after-hours care. The primary care reform did not include behavioral health integration or specific MH-focused initiatives, although some practices may have chosen to use additional available funding to invest in MH services such as those from a social worker. UPC was assigned, as in previous work,³⁴ in the following manner. Those rostered in a primary care model were assigned to that provider. For nonrostered individuals, an algorithm using all primary care billings for the preceding 2 years was used to assign the physician with the highest dollar value of primary care billings for each patient. For

nonrostered youth, those with no primary care use were considered to have no UPC. We categorized each assigned UPC as GP/FP model, GP/FP no model, pediatrician, or no UPC. We hypothesized that patients rostered in primary care models would have better access to MH care.

Characteristics of the assigned UPC, including age, sex, type of physician (GP/FP or pediatrician), years in practice, foreign-trained, full-time/part-time designation, rurality of practice, and practice-level MH volume were included. Mental health volume was determined based on the average annualized volume of distinct outpatient MH-related visits per calendar year for youth 10 to 24 years of age for the number of years that the physician has been in practice; tertiles were used to create categories. We hypothesized that physicians with more activity in MH might be more experienced at identifying MH problems.

Based on the ED record, MH disorders were categorized as follows: 1) acute stress disorder; 2) anxiety; 3) eating disorders; 4) mood/affective disorder; 5) substance-related disorders; 6) self-harm; 7) schizophrenia, delusional, and nonorganic psychotic disorders; 8) selected childhood disorders (e.g., autism spectrum disorder); 9) selected personality and behavior disorders; and 10) other MH-related disorders (see Supplement 1 and Table S1, available online, for mutually exclusive ICD-10 codes used). All visits were assigned a Canadian Triage and Acuity Scale (CTAS) score, a standardized measure assigned when ED patients are triaged, categorized as low (CTAS score 4 or 5) or high acuity (CTAS score 1, 2, or 3).³⁵

The ED visit time and day of the week were used to explore the impact of availability of outpatient services (e.g., after-hours clinic). Visits were categorized based on multiple services likely available (08:01–16:00 Monday–Friday), few services available (16:01–24:00 Monday–Friday, or 08:01–16:00 Saturday/Sunday), or ED as main place to seek care (00:01–08:00 Tuesday–Saturday, or 16:01–08:00 Saturday/Sunday). Similarly, ED visits were categorized by weekday or weekend/statutory holiday (defined by the Ontario Ministry of Labour).

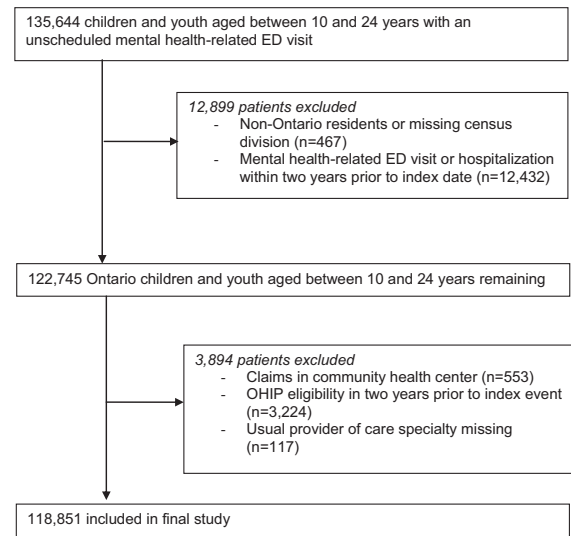
Statistical Analysis

Descriptive statistics were used to summarize the study cohort, using proportions for categorical data and median or mean with standard deviation for continuous data. Differences between groups were assessed using the χ^2 test for categorical data and one-way analysis of variance (ANOVA) for continuous data. Poisson modeling using robust error variances and a priori-selected covariates variables were used to determine predictors of first contact ED visits. Table S2, available online, summarizes how missing data were handled. To explore characteristics of primary care providers associated with first contact, we performed a subgroup analysis including only those patients with a usual provider of primary care. Sensitivity analyses were conducted by stratifying the results by only those children and youth admitted to the hospital, to ensure robustness of findings and relevance to more acutely ill youth. Risk ratios (RR) and 95% CIs are reported. All analyses were conducted in SAS Enterprise guide version 6.1 (SAS Institute, Inc., Cary, NC).

RESULTS

Following exclusions (Figure 1), we included 118,851 youth with a first-time ED visit for an MH problem between 2010 and 2014, of whom 16,666 (14.0%) were hospitalized and 40 died in the ED. Most visits were due to substance-related disorders (26.6%), anxiety (20.4%), mood/affective

FIGURE 1 Flowchart detailing inclusion criteria. Note: ED = emergency department; OHIP = Ontario Health Insurance Plan.



disorders (18.2%), and acute stress disorder (14.4%). We present the overall cohort by admission status in Table S3, available online, for descriptive purposes only, as those individuals who were admitted may represent a somewhat different clinical population. Only a small proportion of youth with an ED visit for substance-related disorders (2.7%) and anxiety (2.4%) were admitted to hospital, whereas 70.1% of youth who presented with schizophrenia, delusional disorders, and psychotic disorders were hospitalized.

More than half (53.5%) of youth had no prior outpatient MH care (Table 1). The ED visits for those with no prior MH care were more likely to be for substance-related disorders (34.3% vs 17.8%) but less likely for mood/affective (13.5% vs 23.6%) and selected childhood disorders (0.9% vs 3.4%). In the 2 years preceding first contact, youth had an average of 4.2 primary care visits compared to 10.4 visits in those with prior MH care; 30.9% of youth with prior outpatient MH care had one or more visits to a psychiatrist. Of patients admitted from the ED for MH care, 41.2% had never previously seen an outpatient provider.

The adjusted RRs of first contact ED visits for MH-related disorders are shown in Table 2. Compared with non-immigrants, refugee immigrants (RR = 1.17, 95% CI = 1.13–1.21) and nonrefugee immigrants (RR = 1.10, 95% CI = 1.08–1.13) had a greater risk of first contact. As neighborhood income quintile decreased, the risk of first contact increased (lowest versus highest income quintile; RR = 1.04, 95% CI = 1.03–1.06). Children and youth without a UPC were significantly more likely to have a first contact ED visit (no UPC versus GP/FP model; RR = 1.78, 95% CI = 1.77–1.80).

Among children and youth with a UPC (n = 112,447), certain provider characteristics were associated with

TABLE 1 Characteristics of Children and Youth With a First Contact Emergency Department (ED) Visit by Prior Outpatient Care for Mental Health–Related Disorders, 2010–2014 (N = 118,851)

Variable	No Previous Outpatient Visit (n = 63,538)	Previous Outpatient Visit (n = 55,313)	Total (N = 118,851)	Std Diffs	p Value
Age, y, mean \pm SD	18.3 (3.3)	18.4 (3.5)	18.35 (3.4)	0.01	.059
10–13, n (%)	4,635 (7.3)	4,681 (8.5)	9,316 (7.8)	0.08	<.001
14–17, n (%)	21,023 (33.1)	18,090 (32.7)	39,113 (32.9)		
18–21, n (%)	25,164 (39.6)	20,224 (36.6)	45,388 (38.2)		
22–24, n (%)	12,716 (20.0)	12,318 (22.3)	25,034 (21.1)		
Sex, n (% female)	32,408 (51.0)	31,000 (56.0)	63,408 (53.4)	–0.10	<.001
Income quintile, n (%)					
1 (Low)	15,537 (24.5)	12,448 (22.5)	27,985 (23.5)	0.05	<.001
2 (Medium–low)	12,562 (19.8)	10,982 (19.9)	23,544 (19.8)		
3 (Medium)	12,016 (18.9)	10,512 (19.0)	22,528 (19.0)		
4 (Medium–high)	12,020 (18.9)	10,919 (19.7)	22,939 (19.3)		
5 (High)	11,403 (17.9)	10,452 (18.9)	21,855 (18.4)		
Location (% rural)	6,883 (10.8)	4,244 (7.7)	11,127 (9.4)	–0.11	<.001
Immigration status, n (%)					
Nonimmigrant	58,245 (91.7)	51,732 (93.5)	109,977 (92.5)	0.07	<.001
Nonrefugee immigrant	3,931 (6.2)	2,749 (5.0)	6,680 (5.6)		
Refugee immigrant	1,362 (2.1)	832 (1.5)	2,194 (1.8)		
Time since immigration, n (%)					
Recent (0 to \leq 5 y)	796 (1.3)	417 (0.8)	1,213 (1.0)	0.08	<.001
Intermediate (>5 to \leq 10 y)	1,668 (2.6)	1,020 (1.8)	2,688 (2.3)		
Long-term (>10 y)	2,829 (4.5)	2,144 (3.9)	4,973 (4.2)		
Nonimmigrant	58,245 (91.7)	51,732 (93.5)	109,977 (92.5)		
UPC, n (% yes)	57,775 (90.9)	55,007 (99.4)	112,782 (94.9)	0.41	<.001
Primary care model, n (%)					
GP/FP enrollment program	50,123 (78.9)	48,184 (87.1)	98,307 (82.7)	0.42	<.001
GP/FP fee-for-service	5,257 (8.3)	3,965 (7.2)	9,222 (7.8)		
Pediatrician	2,395 (3.8)	2,858 (5.2)	5,253 (4.4)		
No UPC	5,763 (9.1)	306 (0.6)	6,069 (5.1)		
Outpatient PC visit in prior 2 years, mean (SD)	4.24 \pm 5.63	10.39 \pm 13.21	7.10 \pm 10.37	0.61	<.001
High (upper tertile), n (%)	34,466 (54.2)	49,418 (89.3)	83,884 (70.6)	0.89	<.001
Medium (middle tertile), n(%)	8,009 (12.6)	3,207 (5.8)	11,216 (9.4)		
Low (lower tertile), n (%)	9,243 (14.5)	2,154 (3.9)	11,397 (9.6)		
None, n (%)	11,820 (18.6)	534 (1.0)	12,354 (10.4)		
Outpatient psychiatrist visit in prior 2 y	–	17,098 (30.9)	–	–	–
ED visits any reason in prior 2 y, mean (SD)	1.57 \pm 2.55	2.00 \pm 3.19	1.77 \pm 2.87	0.15	<.001
\geq 3 visits, n (%)	13,274 (20.9)	14,649 (26.5)	27,923 (23.5)	0.17	<.001
2 visits, n (%)	7,991 (12.6)	7,737 (14.0)	15,728 (13.2)		
1 visit, n (%)	14,526 (22.9)	12,970 (23.4)	27,496 (23.1)		
None, n (%)	27,747 (43.7)	19,957 (36.1)	47,704 (40.1)		
Low-acuity ED visits in prior 2 y, mean \pm SD	0.84 \pm 1.69	0.95 \pm 1.82	0.89 \pm 1.75	0.06	<.001
\geq 3 visits, n (%)	6,268 (9.9)	6,254 (11.3)	12,522 (10.5)	0.07	<.001
2 visits, n (%)	5,560 (8.8)	5,229 (9.5)	10,789 (9.1)		
1 visit, n (%)	13,137 (20.7)	12,057 (21.8)	25,194 (21.2)		
None, n (%)	38,573 (60.7)	31,773 (57.4)	70,346 (59.2)		
Mental health diagnosis, n (%)					
Acute stress	8,570 (13.5)	8,568 (15.5)	17,138 (14.4)	0.47	<.001
Anxiety	12,645 (19.9)	11,593 (21.0)	24,238 (20.4)		
Eating disorders	307 (0.5)	548 (1.0)	855 (0.7)		
Mood/affective disorder	8,592 (13.5)	13,051 (23.6)	21,643 (18.2)		
Other mental health disorders	2,965 (4.7)	1,849 (3.3)	4,814 (4.1)		
Residual self-harm	6,271 (9.9)	5,387 (9.7)	11,658 (9.8)		
Schizophrenia, delusional, and psychotic disorders	1,588 (2.5)	2,085 (3.8)	3,673 (3.1)		

TABLE 1 Continued

Variable	No Previous Outpatient Visit (n = 63,538)	Previous Outpatient Visit (n = 55,313)	Total (N = 118,851)	Std Diff	p Value
Selected childhood disorders	583 (0.9)	1,905 (3.4)	2,488 (2.1)		
Selected personality and behavior disorders	231 (0.4)	474 (0.9)	705 (0.6)		
Substance-related disorders	21,786 (34.3)	9,853 (17.8)	31,639 (26.6)		
Admitted to hospital (%)	6,869 (10.8)	9,786 (17.7)	16,655 (14.0)	0.20	<.001
Death during ED visit (n)	29 (0.0)	11 (0.0)	40 (0.0)	−0.01	.016
CTAS score (% high)	51,416 (80.9)	46,536 (84.1)	97,952 (82.4)	0.09	<.001
Service time ED visit, n (%)					
Daytime	15,375 (24.2)	17,042 (30.8)	32,417 (27.3)	0.24	<.001
Evening and after-hours	22,049 (34.7)	21,817 (39.4)	43,866 (36.9)		
Night	26,114 (41.1)	16,454 (29.7)	42,568 (35.8)		
ED visit on weekend/statutory holiday, n (%)	23,260 (36.6)	15,433 (27.9)	38,693 (32.6)	−0.19	<.001

Note: CTAS = Canadian Triage Acuity System; FP = family practitioner; GP = general practitioner; PC = primary care; Std Diff = standardized differences of mean; UPC = usual provider of primary care.

increased risk of first contact, including foreign training, rurality, male sex, and working full-time (Table 3). Provider MH practice volume had a dose–response effect, with lower MH volume associated with higher risk of first contact. Youth with a UPC remunerated by FFS, in other words, not part of a primary care reform model, had a 10% greater risk of first contact ED visits.

When the analysis was stratified by age group, most findings were similar to the overall cohort (Table S4, available online). In the 10- to 17-year age group, males had a lower risk of first contact, whereas in the 18- to 24-year age group, the risk was elevated. Neighborhood income quintile was not associated with increased risk of first contact in the 10- to 17-year age group, whereas it was significant in older youth. When the analysis was restricted to youth admitted to hospital, most findings were similar to those discharged from ED. The risk of no prior outpatient MH care for youth from the lowest neighborhood income quintile was even greater.

DISCUSSION

In this large, population-based study, we report that more than half of children and youth who presented to the ED with a new MH condition had not previously sought MH care in an outpatient setting. Although there was a diverse range of MH diagnoses, 81% of visits were due to anxiety, adjustment, mood/affective, and substance-related disorders. Given that most first contact literature on MH conditions focuses on adults with psychotic disorders^{15,36} or children and youth referred to mental health services,³⁷ our study fills an important gap.

We identified several risk factors for first contact mental health ED visits. Consistent with prior research on poverty and poor access to MH care,²⁰ youth from the most deprived neighborhoods were more likely to have first contact in an ED. Youth living in rural regions were also less likely to receive outpatient care before first ED contact.

These data support qualitative research that reported that rural adolescents may delay seeking help for MH problems due to concerns of gossip, perceived social proximity, and limited availability of resources.³⁸ Youth with prior low-acuity ED visits were more likely to have first contact ED visits potentially due to a tendency to use emergency services for less urgent causes,^{31,39} or this may reflect primary care access issues. Refugees and nonrefugee immigrants were also more likely to have first contact visits compared to nonimmigrants. First contact may be due to poor (actual or perceived) primary care access, reduced proficiency in English, stigma, inability to navigate the health care system, or a higher acuity of illness.^{12,16,18} Given that immigrants make up 20% of the population,⁴⁰ our findings highlight a high-risk group that may require targeted interventions.

It is not surprising that most youth with substance-related disorders (some of which may be a first-time acute intoxication) have no prior outpatient MH care, yet 43% of visits for schizophrenia, delusional, and psychotic disorders were also first contact. Although some ED visits are likely unavoidable and are related to the speed of onset (i.e., episode of severe intoxication), others are not (e.g., newly diagnosed schizophrenia, adjustment, and anxiety disorders), and treatment should be initiated early in ambulatory settings. Indeed, two-thirds of children with substance-related disorders were first contact visits, whereas less than one-fourth of more slowly developing disorders, such as autism spectrum disorder, were first contact.

Most first contact ED visits were triaged as high acuity and likely appropriate for an emergency care venue, but mild MH problems in some youth may have evolved into severe crises due to poor primary care access or clinician difficulty in recognizing MH symptoms.⁴¹ Indeed, we found that youth with a primary care physician whose practice had a relatively higher volume of MH visits and who participate in a capitation-based primary care model

TABLE 2 Adjusted Risk Ratios (ARR) of No Prior Outpatient Care for Mental Health Emergency Department (ED) Visits, 2010–2014 (n = 118,811)^a

Variable	ARR (95% CI)
Age, y (reference = 22–24 y)	
10–13	1.01 (0.98–1.03)
14–17	1.09 (1.07–1.10)
18–21	1.11 (1.09–1.12)
Male sex	1.06 (1.05–1.07)
Rural residence	1.16 (1.14–1.18)
Neighborhood income quintile (reference = 5, high)	
1 (low)	1.04 (1.03–1.06)
2 (medium–low)	1.02 (1.00–1.03)
3 (medium)	1.02 (1.00–1.04)
4 (medium–high)	1.01 (0.99–1.03)
Immigration category (reference = nonimmigrant)	
Nonrefugee immigrant	1.10 (1.08–1.13)
Refugee immigrant	1.17 (1.13–1.21)
ED visits for any reason in prior 2 y (reference = 0 visits)	
Low (1 visit)	0.87 (0.86–0.89)
Moderate (2 visits)	0.81 (0.79–0.83)
High (≥3 visits)	0.72 (0.71–0.74)
Low-acuity ED visits in prior 2 y (reference = 0 visits)	
Low (1 visit)	1.09 (1.07–1.11)
Moderate (2 visits)	1.17 (1.14–1.20)
High (≥3 visits)	1.17 (1.13–1.20)
Specialty of UPC (reference = GP/FP model)	
GP/FP fee-for-service	1.11 (1.09–1.13)
Pediatrician	0.90 (0.87–0.93)
None	1.78 (1.77–1.80)

Note: FP = family practitioner; GP = general practitioner; UPC = usual provider of primary care.
^aMissing = 40 (excluded those who died in ED).

that required after-hours access to primary care³³ had lower first contact ED visits. The clear temporal pattern of first-contact ED use (76% of visits occur after 16:00 on weekdays and on weekends/holidays), similar to findings in other studies,²¹ also suggests that access to primary care may play a role.

One striking finding in our study was the large number of primary care visits for any reason in youth with prior outpatient MH care (10.4 compared with 4.2 visits in the 2 years before the ED visit). Given that only 31% of children were seeing a psychiatrist, this highlights the major and underrecognized role of primary care in managing MH problems. The key role of primary care in the pathway to first diagnosis was also found in an Australian study in adults in which 53% of patients saw a GP before receiving specialist MH care.³⁶ However, children and youth with first contact ED visits are accessing primary care for non-MH-related problems, which may represent a missed opportunity. Further

TABLE 3 Adjusted Risk Ratio (ARR) of No Prior Outpatient Care by Primary Care Characteristics in Individuals With a Primary Care (PC) Provider, 2010–2014 (n = 112,447)

Variable	ARR (95% CI) ^{a,b}
Enrollment model (reference = GP/FP model)	
GP/FP fee-for-service	1.10 (1.08–1.12)
Pediatrician	0.92 (0.89–0.95)
Male sex	1.07 (1.06–1.08)
Full-time	1.11 (1.06–1.16)
Rural location	1.10 (1.07–1.12)
Years in PC practice (reference = >20 y)	
≤10	0.99 (0.97–1.00)
11–20	1.00 (0.98–1.01)
Foreign trained	1.06 (1.04–1.07)
Mental health volume in prior 2 y (reference = highest tertile)	
Medium tertile	1.12 (1.10–1.13)
Low tertile	1.25 (1.23–1.27)

Note: FP = family practitioner; GP = general practitioner.
^aAdjusted for age, sex, residence, neighborhood income quintile, low-acuity emergency department (ED) visits in past 2 years, all ED visits in past 2 years, and specialty of usual provider of primary care.
^bMissing = 297.

research is needed on potential screening mechanisms⁴² to identify specific MH problems earlier.

To our knowledge, our study is the first to evaluate children and youth who first present to the ED with any MH-related condition. Unlike other studies,^{12,13,43,44} we minimized selection bias by including all MH diagnoses across a range of hospitals in a universal access health care system. Although administrative datasets provide insights into a large population of patients, they have inherent limitations, including potential coding errors and a lack of data on contributing factors (e.g., substance use), education levels, and use of nonphysician community MH services (e.g., psychologists and social workers). We did not determine whether the prior outpatient visit was for the same MH condition as the first contact ED visit, nor did we determine the timing of the prior outpatient visit in relation to the incident ED visit.

Using the ED as a first point of contact for MH services is increasingly being identified as a health system quality indicator.¹ Our study suggests that high rates of first contact reflect poor access to timely MH care, much of which would be delivered by primary care providers. Although the ED plays an important role in crisis management, the priority is stabilization rather than rehabilitation, and referrals to community resources are often deferred to primary care.¹² We identified several risk factors associated with first contact that have important implications for clinicians and policy makers. For more than half of youth who present to the ED, emergency clinicians should ensure that appropriate follow-up is arranged. However, health care system strategies to improve access to appropriate primary care and

referral to specialized services as necessary to prevent these ED visits will also be important. &



Clinical Guidance

- More than half of children and youth who present to the emergency department (ED) with a mental health (MH) condition have not previously received outpatient physician care for MH problems.
- Many of these ED visits occur after hours, but ED staff need to have systems to ensure timely and adequate follow-up, especially given how many are the first presentation for MH problems.
- Children and youth at greatest risk for no previous MH care include those from rural areas, low-income neighborhoods, or immigrant families.
- Children and youth whose primary care providers have more of a focus on MH or who are mandated to provide after-hours access are more likely to have previously sought outpatient care for MH problems before presenting to the ED.

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SUPPLEMENT 1

Mental Health Disorder Categorization

The following databases were used to determine mental health diagnosis: National Ambulatory Care Reporting System (NACRS), Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD), and the Ontario Mental Health Reporting System (OMHRS). OMHRS is a specific data holding at CIHI that includes specific data for

inpatient mental health services planning. Both NACRS and CIHI-DAD use *International Classification of Diseases–10th Revision (ICD-10-CA)* codes, whereas OMHRS uses *DSM-IV-TR* codes.

Mental health conditions were grouped into the following categories, based on respective *ICD-10-CA* or *DSM-IV* codes listed in the relevant database (see Table S1).

TABLE S1 Mental Health Diagnoses and Codes by Database

Mental Health Diagnosis	ICD-10-CA Codes	DSM-IV Codes
Substance-related disorders	F10–F19, F55	291.x (0, 1, 2, 3, 5, 81, 89, 9), 292.0, 292.11, 292.12, 292.81, 292.82, 292.83, 292.84, 292.89, 292.9, 303.xx (00, 90), 304.xx (00, 10, 20, 30, 40, 50, 60, 80, 90), 305.xx (excluding 305.80)
Schizophrenia, delusional, and nonorganic psychotic disorders	F20 (excluding F20.4), F22–F29, F53.1	295.xx (10, 20, 30, 40, 60, 70, 80, 90), 297.1, 297.3, 298.8, 298.9, 293.81, 293.82
Mood/affective disorders	F30, F31, F32, F33, F34, F38, F39, F53.0	296.0x, 296.2x, 296.3x, 296.4x, 296.5x, 296.6x, 296.7, 296.80, 296.89, 296.90, 300.4, 301.13; 311
Anxiety disorders – anxiety	F40–F42, F93.0–F93.2 (excluding F93.0)	300.xx, 300.3, 309.21
Anxiety disorders – acute stress	F43	293.84, 308.3, 309.81
Selected personality and behavior disorders	F60–F62, F68–F69, F21	301.0, 301.20, 301.22, 301.4, 301.50, 301.6, 301.7, 301.81–301.83, 301.9
Eating disorders	F50	307.1, 307.50, 307.51
Selected childhood disorders (e.g., CD, ADHD, ASD)	F84, F90, F91	299.xx, 314.xx, 312.xx, 313.81
Residual self-harm emergency department visits (NACRS ONLY)	X60–X84, Y10–Y19, Y28 in Dx10Code2 to Dx10Code10 and no specified mental health code in Dx10Code1 (F04–F99)	
Other mental health disorders	All other ICD-10-CA or DSM-IV not included in categories above	

Note: ADHD = attention-deficit/hyperactivity disorder; ASD = autism spectrum disorder; CD = conduct disorder; ICD-10 = International Classification of Diseases–10th Revision; NACRS = National Ambulatory Care Reporting System.

TABLE S2 Decisions Regarding How to Handle Missing Data

Variable	Number Missing (%)	Decision
Income quintile	830 (0.7)	Merge with lowest quintile
RIO 2008	2,157 (1.8)	Merge with urban
Low-acuity ED visits	90 (0.1)	Merge with none
CTAS score	265 (0.2)	Merge with low acuity ^a

Note: CTAS = Canadian Triage Acuity System; ED = emergency department.
^aCTAS score of 4 or 5.

TABLE S3 Children and Youth With a First-Contact Emergency Department (ED) Visit for a Mental Health–Related Disorder, 2010–2014 (N = 118,811)^a

Variable	Admitted to Hospital (n = 16,666)	Discharged Home (n = 102,156)	Total (n = 118,811)	Std Diff	p Value
Age, y, mean ± SD	18.02 ± 3.33	18.41 ± 3.39	18.35 ± 3.38	−0.12	<.001
10–13, n (%)	1,302 (7.8)	8,009 (7.8)	9,311 (7.8)	0.18	<.001
14–17, n (%)	6,669 (40.0)	32,432 (31.7)	39,101 (32.9)		
18–21, n (%)	5,571 (33.4)	39,800 (39.0)	45,371 (38.2)		
22–24, n (%)	3,113 (18.7)	21,915 (21.5)	25,028 (21.1)		
Sex, n (% female)	8,946 (53.7)	54,449 (53.3)	63,395 (53.4)	−0.008	.321
Income quintile, n (%)					
1 (low)	3,829 (23.0)	24,145 (23.6)	27,974 (23.5)	0.022	.152
2 (medium–low)	3,306 (19.8)	20,229 (19.8)	23,535 (19.8)		
3 (medium)	3,170 (19.0)	19,353 (18.9)	22,523 (19.0)		
4 (medium–high)	3,317 (19.9)	19,617 (19.2)	22,934 (19.3)		
5 (high)	3,033 (18.2)	18,812 (18.4)	21,845 (18.4)		
Location, n (% rural)	1,337 (8.0)	9,782 (9.6)	11,119 (9.4)	−0.055	<.001
Immigration status, n (%)					
Nonimmigrant	15,164 (91.0)	94,776 (92.8)	109,940 (92.5)	0.065	<.001
Nonrefugee immigrant	1,146 (6.9)	5,531 (5.4)	6,677 (5.6)		
Refugee immigrant	345 (2.1)	1,849 (1.8)	2,194 (1.8)		
Time since immigration, n (%)					
Recent (0 to ≤5 y)	217 (1.3)	996 (1.0)	1,213 (1.0)	0.065	<.001
Intermediate (>5 to ≤10 y)	472 (2.8)	2,214 (2.2)	2,686 (2.3)		
Long-term (>10 y)	802 (4.8)	4,170 (4.1)	4,972 (4.2)		
Nonimmigrant	15,164 (91.0)	94,776 (92.8)	109,940 (92.5)		
UPC (% yes)	15,860 (95.2)	96,884 (94.8)	112,744 (94.9)	0.018	.035
Primary care model, n (%)					
GP/FP enrollment program	13,859 (83.2)	84,413 (82.6)	98,272 (82.7)	0.02	.12
GP/FP fee-for-service	1,259 (7.6)	7,960 (7.8)	9,219 (7.8)		
Pediatrician	742 (4.5)	4,511 (4.4)	5,253 (4.4)		
No UPC	795 (4.8)	5,272 (5.2)	6,067 (5.1)		
Outpatient PC visits in prior 2 years, mean ± SD	7.46 ± 11.64	7.05 ± 10.15	7.11 ± 10.37	0.038	<.001
High (upper tertile), n (%)	12,213 (73.3)	71,648 (70.1)	83,861 (70.6)	0.07	<.001
Medium (middle tertile), n (%)	1,433 (8.6)	9,776 (9.6)	11,209 (9.4)		
Low (lower tertile), n (%)	1,460 (8.8)	9,933 (9.7)	11,393 (9.6)		
None, n (%)	1,549 (9.3)	10,799 (10.6)	12,348 (10.4)		
Outpatient psychiatrist visit in prior 2 y	3,850 (23.1)	13,244 (13.0)	17,094 (14.4)	0.22	<.001
ED visits any reason in prior 2 y, mean ± SD	1.60 ± 2.58	1.80 ± 2.91	1.77 ± 2.87	−0.074	<.001
≥3 visits, n (%)	3,527 (21.2)	24,388 (23.9)	27,915 (23.5)	0.074	<.001
2 visits, n (%)	2,140 (12.8)	13,581 (13.3)	15,721 (13.2)		
1 visit, n (%)	3,889 (23.4)	23,598 (23.1)	27,487 (23.1)		
None, n (%)	7,099 (42.6)	40,589 (39.7)	47,688 (40.1)		

TABLE S3 Continued

Variable	Admitted to Hospital (n = 16,666)	Discharged Home (n = 102,156)	Total (n = 118,811)	Std Diff	p Value
Low-acuity ED visits in prior 2 years, mean \pm SD	0.73 \pm 1.50	0.92 \pm 1.79	0.89 \pm 1.75	-0.11	<.001
≥ 3 visits, n (%)	1,392 (8.4)	11,127 (10.9)	12,519 (10.5)	0.11	<.001
2 visits, n (%)	1,311 (7.9)	9,470 (9.3)	10,781 (9.1)		
1 visit, n (%)	3,410 (20.5)	21,779 (21.3)	25,189 (21.2)		
None, n (%)	10,542 (63.3)	59,780 (58.5)	70,322 (59.2)		
Mental health diagnosis, n (%)					
Acute stress	1,376 (8.3)	15,762 (15.4)	17,138 (14.4)	1.40	<.001
Anxiety	579 (3.5)	23,658 (23.2)	24,237 (20.4)		
Eating disorders	289 (1.7)	566 (0.6)	855 (0.7)		
Mood/affective disorder	5,945 (35.7)	15,698 (15.4)	21,643 (18.2)		
Other mental health disorders	387 (2.3)	4,427 (4.3)	4,814 (4.1)		
Residual self-harm	4,086 (24.5)	7,533 (7.4)	11,619 (9.8)		
Schizophrenia, delusional, and psychotic disorders	2,576 (15.5)	1,097 (1.1)	3,673 (3.1)		
Selected childhood disorders	442 (2.7)	2,046 (2.0)	2,488 (2.1)		
Selected personality and behavior disorders	125 (0.8)	580 (0.6)	705 (0.6)		
Substance-related disorders	850 (5.1)	30,789 (30.1)	31,639 (26.6)		
CTAS score (% high)	15,873 (95.3)	82,040 (80.3)	97,913 (82.4)	0.47	<.001
Service time ED visit, n (%)					
Daytime	5,388 (32.4)	27,019 (26.4)	32,407 (27.3)	0.25	<.001
Evening and afterhours	6,951 (41.7)	36,891 (36.1)	43,842 (36.9)		
Night	4,316 (25.9)	38,246 (37.4)	42,562 (35.8)		
ED visit on weekend/statutory holiday, n (%)	3,936 (23.6)	34,749 (34.0)	38,685 (32.6)	-0.23	<.001

Note: CTAS = Canadian Triage Acuity System; FP = family practitioner; GP = general practitioner; PC = primary care; Std Diff = standardized difference of mean; UPC = usual provider of care.
^aMissing = 40 (excluded those who died in ED).

TABLE S4 Adjusted Risk Ratios (ARR) of No Prior Outpatient Care for Mental Health Emergency Department (ED) Visits Stratified by Age Group, 2010–2014 (n = 118,811)^a

Variable	ARR (95% CI)	
	Age 10–17 y	Age 18–24 y
Age, y		
10–13	0.93 (0.91–0.95)	—
14–17	(Reference)	—
18–21	—	1.10 (1.09–1.12)
22–24	—	(Reference)
Male sex	0.97 (0.95–0.98)	1.13 (1.11–1.14)
Rural residence	1.15 (1.12–1.18)	1.17 (1.15–1.20)
Neighborhood income quintile (reference = 5, high)		
1 (low)	1.03 (1.00–1.05)	1.06 (1.04–1.08)
2 (medium–low)	1.00 (0.97–1.02)	1.03 (1.01–1.06)
3 (medium)	1.00 (0.97–1.03)	1.04 (1.02–1.06)
4 (medium–high)	0.99 (0.96–1.02)	1.02 (1.00–1.04)
Immigration category (reference = nonimmigrant)		
Nonrefugee immigrant	1.16 (1.12–1.20)	1.08 (1.06–1.11)
Refugee immigrant	1.28 (1.20–1.35)	1.13 (1.08–1.17)
ED visits for any reason in prior 2 y (reference = 0 visits)		
Low (1 visit)	0.86 (0.83–0.88)	0.89 (0.87–0.91)
Moderate (2 visits)	0.79 (0.76–0.82)	0.83 (0.80–0.85)
High (≥ 3 visits)	0.72 (0.69–0.75)	0.73 (0.71–0.75)
Low acuity ED visits in prior 2 y (reference = 0 visits)		
Low (1 visit)	1.11 (1.08–1.14)	1.08 (1.06–1.11)
Moderate (2 visits)	1.21 (1.16–1.27)	1.14 (1.10–1.18)
High (≥ 3 visits)	1.18 (1.13–1.24)	1.15 (1.11–1.20)
Specialty of UPC (reference = GP/FP model)		
GP/FP fee-for-service	1.19 (1.15–1.23)	1.08 (1.05–1.10)
Pediatrician	0.87 (0.84–0.91)	1.01 (0.95–1.07)
None	1.78 (1.76–1.81)	1.76 (1.74–1.78)

Note: FP = family practitioner; GP = general practitioner; UPC = usual provider of primary care.
^aMissing = 40 (excluded those who died in ED).