Supplemental Table 1 Description of Study Measures

Variable	Data Sources	Timing	Rationale and Coding
Age	Date of birth from Registered Persons Data Base (RPDB)[1]	Most recent ED contact, year	To account for potential differences between cases and controls,[2] the following categories were selected to improve precision without altering direction of findings: 10 to 15 years (reference) 16 to 17 years 18 to 25 years
Community Size	RPDB postal code, Census population data and Statistics Canada Postal Code Conversion File[3]	Most recent ED contact, year. When year was 2003 used census 2001, when year was 2004-2008 used census 2006 when year > 2008 used census 2011 data	To account for potential differences between cases and controls on rural residence,[2] individuals were assigned to their dissemination area (DA): a small, relatively stable geographic unit and the smallest standard geographic area for which census data are produced. Rural residence was defined according to Statistics Canada's recommended definition of rural and small town, i.e., population <10,000.[4] The population of the community in which the individual resided was then assigned and categorized to improve precision without altering direction of the findings: 1,500,000+ 10,000-1,499,999 (reference) < 10,000 (rural)
Neighbourhood Income	As above	As above	To account for potential differences between cases and controls on SES,[5] the mean income per person equivalent (household income, adjusted for household size) was calculated for each DA (described above). Then, DAs were ranked according to this measure by city, town or rural/small town area in which the dissemination area was located. Next, the population of the city, town or rural/small town area was divided into approximate fifths to create community-specific income quintiles. Individuals were assigned to the income quintile in which they resided: 1 (lowest) to 5 (highest) or missing. To improve precision without altering the direction of the findings, income quintiles were dichotomized: 1 *vs.* 2 to 5
Type of ED contact	National Ambulatory Care Reporting System (NACRS)[6]	Most recent ED contact, date	The type of ED contact was dichotomized (and youth, stratified) into two categories given the low overlap (5%) between a mental health or other problem according to the presence of an ICD-10-CA diagnostic code, chapters 1 to 20.[7] Previous chart abstraction indicates these diagnoses are quite reliable.[8]

1) Mental health problem			Mental disorders F00-F99 (chapter 5) and/or a self-inflicted poisoning or injury X60 to X84 (in chapter 20)
2) 'Other' only problem			All remaining (non-mental health) ICD-10-CA diagnostic codes.
1) Mental health problem type	NACRS	Most recent ED contact, date	This type of ED contact was specified by the presence of the following codes:
Alcohol use disorder			F10 =yes; else=no
Other Substance Use			F11-F19 =yes; else=no
Schizophrenia/Schizotypal/Delusional			F20-F29 =yes; else=no
Mood disorders			F30-F39 =yes; else=no
Anxiety disorders			F40-F48 =yes; else=no
Other mental disorders			F00-F09; F50-F99 =yes; else=no
Self-inflicted poisoning			X60-X69 =yes; else=no
Self-inflicted cut/pierce			X78=yes; else=no
Self-inflicted other			X70-X77; X79-X84=yes; else=no
Both mental & 'other' health problem			Any mental health problem code (above) and an 'other' (non-mental health) problem code=yes; else=no
2) 'Other' health problem type	NACRS	Most recent ED contact, date	This type of ED contact was specified according to injuries and poisonings not self-inflicted[9] into the following dichotomous categories:
Unintentional injury			S00-T35 (in chapter 19) =yes; else=no
Unintentional poisoning			T36-T65 (in chapter 19) =yes; else=no
Assault			X85-Y09 (in chapter 20) =yes; else=no
Undetermined injury or poisoning			Y10-Y34 (in chapter 20) =yes; else=no
Reference = 'no'			Note: 'else=no' refers to any 'other' (non-mental) health problem code. Codes V01-X59 (in chapter 20) are excluded as they overlapped with their respective injury or poisoning codes noted above (chapter 19). The decision to collapse the remaining codes together was made after comparing their frequencies in each of the ICD-10-CA chapters (1 to 4; 6 to18) and T66-98 (in chapter 19) and Y35-98 (in chapter 20) in cases and controls by sex. There were no significant differences or cell sizes were suppressed for privacy reasons.
Timing of ED contact	NACRS	Most recent ED contact, date	Timing of presentation was measured to account for potential differences between cases and controls. Youth who self-harm vary by the weekday and month they present to hospital[10] and tend to present outside office hours.[11, 12] Also, self-harm rates changed over time during the study years.[13, 14]
Registration time			9 am to 5 pm; after 5 pm to midnight *vs.* after midnight but before 9 am
Day of week			Weekday (Monday through Friday) *vs.* Weekend (Saturday and Sunday)
Month of year			January, February, March, April, May, June, July, August, September, October *vs.* November to December. The last two

			months were collapsed for precision without altering direction of the results.
Year			Fiscal years were dichotomized as: the last two study years 12/13 and 13/14 *vs.* 02/03 to 11/12 to improve precision without altering direction of the results.
Acuity of ED contact:	NACRS	Most recent ED contact, date	Acuity was measured to account for potential differences between cases and controls. Youth who self-harm have higher acuity presentations than their peers.[15] The Canadian Triage and Acuity Scale (CTAS) is a validated scale[16] given to patients on arrival to the ED (or shortly thereafter) to prioritize their care. The CTAS has been found to have high inter-observer agreement.[17, 18] The three lowest categories were collapsed into one to improve precision without altering direction of findings. 1=Resuscitation 2=Emergent 3=Urgent,4= Semi-urgent, 5= Non-urgent (levels 3 to 5: reference)
Prior medical care:			To account for potential differences between cases and controls at baseline prior medical care was defined as:
Mental health contact	NACRS, Ontario Health Insurance Program (OHIP)	In the 30 days before the most recent ED contact, date	Mental healthcare was classified into three mutually exclusive, hierarchical categories indicating the level of care received:[2] ED and/or inpatient Outpatient only None (reference)
ED contact for any reason	NACRS	In the 365 days before the most recent ED contact, date	Coded yes *vs*. no
Days to death	NACRS and the Ontario Office of the Chief Coroner	Most recent ED contact, date and death date	Calculated among cases to measure the time to intervene.[19]

Supplementary Table 1 References

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