alternative access to rather than inappropriate actions by the patient.[2]

More than 50% of all acute care visits by the uninsured are to emergency physicians, who comprise less than 5% of the total number of physicians in the United States.[3] In addition, for the general population, we must consider the possibility that EDs are not, in fact, significantly overused at all.

Evidence would suggest that people are not increasingly reliant on EDs to meet ambulatory care needs. Between 1999 and 2009, total ambulatory visits increased from 841 million to 1.13 billion, or 3720 visits per 1000 people annually.[4] During this same period, the number of ED visits increased from approximately 108 million to 124 million, which is a slower rate of growth.[4,5]

In other words, total ambulatory visits increased more quickly than ED visits, implying that patients are finding accessible ambulatory care, at least if they have insurance. Visits to the ED currently make up a lower proportion of total ambulatory visits than the prior decade. The growth of ED visits might not signal a problem at all, but rather that our health care system is undergoing fundamental change.

This change includes a shift away from inpatient use and toward outpatient care, especially for the increasing numbers of patients with complex illnesses.[4] During the same period, there has been a decline in hospitalizations, which would not have been achievable without highly effective ambulatory services, backed up by 24-hour, relatively unconstrained access to high-intensity, high-quality emergency care.

As policy makers look to optimize models for health care delivery, it should not be presumed that that ED use rates, in isolation, are somehow an indicator of quality or cost-effectiveness. Immediate ED access is an important part of the portfolio of health care services provided to a population.

The proposal by Cowling and Majeed to focus on population health is quite wise. Reducing the cost of health care is most effectively achieved when the need for health care is reduced. In doing so, policy makers should focus less on ED use alone and instead focus on whether patients have accessible, cost-effective medical services that will achieve desired health outcomes. As coordinated solutions to achieve this end are implemented, the absolute number of ED visits may not decrease, although their proportion in relation to overall ambulatory visits may indeed decline further.

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RESEARCH LETTER

Prevalence and Correlates of Traumatic Brain Injuries Among Adolescents

To the Editor: Traumatic brain injury (TBI) among adolescents has been identified as an important health priority.[1,2] However, studies of TBI among adolescents in large representative samples are lacking.[1,2] This information is important to the planning and evaluation of injury prevention efforts, particularly because even minor TBI may have important adverse consequences.[2]

We describe the prevalence of TBI, mechanisms of injury, and adverse correlates in a large representative sample of adolescents living in Ontario, Canada.

Methods. Data were derived from the Centre for Addiction and Mental Health's 2011 Ontario student drug use and health survey, consisting of anonymous, self-administered questionnaires completed in classrooms (62% response rate) by students grades 7-12 (age range: 11-20 years). A complete description of the study, including design and discussion of the validity of self-reports, potential nonresponse bias, and limitations, is available.[3]

Traumatic brain injury was defined as an acquired head injury in which the student was unconscious for at least 5 minutes or hospitalized overnight.[4] Students were asked if they ever had such injury in the past 12 months or in their lifetime (excluding the past 12 months). Students reporting TBI in the past 12 months were asked about the source of the injury. Questions about consumption of alcohol and cannabis use during the last 12 months and usual grades received were also included.

All participants provided signed and parental consent. Research ethics board approval was provided by the Centre for Addiction and Mental Health, York University, and public and Catholic school boards throughout Ontario. The surveys were administered during a class period by field staff. Analyses were based on a complex sample design with 15 strata (region × school level), 181 primary sampling units (schools), and 8915 students.

All analyses used Taylor series linearization available in the complex sample module in SPSS version 20.0 (SPSS Inc). Multinomial logistic regression was performed fitting the 5 factors of sex, grade, past-year alcohol use, past-year cannabis use, and school grades against a 2-tailed $P < .05$.

Results. The mean (SD) age of participants was 15.1 (1.82) years. The estimated lifetime prevalence of TBI was 20.2% (95% CI, 18.1%-22.4%); 5.6% (95% CI, 4.2%-7.5%) reported at least 1 TBI in the past 12 months (4.3% of girls and 6.9% of boys) and 14.6% (95% CI, 13.4%-15.9%) reported a TBI in their lifetime but not in the past 12 months (12.8% of girls and 16.2% of boys) (eTable available at http://www.jama.com).

Sports injuries accounted for more than half of the cases in the past 12 months (56%; 95% CI, 50.5%-63.0%) and were more common among males (46.9% in girls and 63.3% in boys). The multinomial logistic regression model distinguished differences among the 3 TBI groups (lifetime, past 12 months, never) (Wald $F_{34,133}$=17.95, $P<.001$).

The odds ratio for a lifetime TBI (excluding the past 12 months) was 3.93 (95% CI, 2.13-7.27) for students who reported poor school grades compared with those with high grades (TABLE). Students who reported occasional to frequent consumption of alcohol and cannabis in the past 12 months had significantly higher odds of TBI in the past 12 months than abstainers.

Discussion. Twenty percent of Ontario students in grades 7-12 in this provincewide school survey reported a TBI at some point in their life, and 5.6% sustained a TBI in the last 12 months. In the United States, more than half a million adolescents aged 15 years or younger require hospital-based care for head injury annually,[2] and our data suggest a much higher number of adolescents may be experiencing these injuries.

The relationship among TBI, substance use, and poorer academic performance needs further investigation. The magnitude of the prevalence estimates and the associated risks identified within this representative sample support suggestions to improve understanding, prevention, and response to TBI among adolescents.[1-3,5,6]

Possible bias related to self-report procedures and the preclusion of causal inferences due to the cross-sectional nature of the data are limitations of this study. Even though our data did not present evidence of appreciable bias overall,[3] nonresponse bias may exist. Future studies should examine long-term outcomes of injury.

Table. Multinomial Logistic Regression for Traumatic Brain Injury (N = 8915 Students)[a]

	Odds Ratio (95% CI)		Adjusted Odds Ratio (95% CI)		
	TBI During Lifetime vs Never[b]	TBI in Past 12 Mo vs Never	TBI During Lifetime vs Never[b]	TBI in Past 12 Mo vs Never	Wald Statistic[c,d]
Sex					
Female	1 [Reference]	1 [Reference]	1 [Reference]	1 [Reference]	$F_{2,165}$ = 11.15
Male	1.36 (1.18-1.56)[d]	1.72 (1.23-2.39)[e]	1.33 (1.15-1.53)[d]	1.76 (1.31-2.37)[d]	
Grade					
12	1 [Reference]	1 [Reference]	1 [Reference]	1 [Reference]	$F_{10,157}$ = 4.49
11	1.40 (0.91-2.18)	0.95 (0.58-1.55)	1.39 (0.97-1.99)	1.04 (0.68-1.60)	
10	1.34 (0.86-2.07)	1.06 (0.60-1.86)	1.48 (1.01-2.15)[f]	1.55 (0.93-2.58)	
9	1.05 (0.79-1.40)	0.87 (0.47-1.60)	1.30 (0.96-1.75)	1.66 (0.79-3.45)	
8	1.20 (0.87-1.66)	1.17 (0.54-2.56)	1.65 (1.19-2.29)[e]	3.50 (1.60-7.64)[e]	
7	1.10 (0.79-1.54)	0.63 (0.29-1.37)	1.64 (1.16-2.30)[e]	2.35 (1.03-5.35)[f]	
Alcohol consumption[g]					
Never	1 [Reference]	1 [Reference]	1 [Reference]	1 [Reference]	$F_{6,161}$ = 10.03
Lifetime[b]	1.45 (0.78-2.68)	2.56 (1.00-6.53)	1.41 (0.78-2.54)	2.58 (1.09-6.09)[f]	
Infrequently	1.41 (1.09-1.81)[f]	3.21 (1.81-5.71)[d]	1.40 (1.06-1.84)[f]	3.27 (1.93-5.52)[d]	
Occasionally	2.03 (1.33-3.09)[f]	7.16 (4.61-11.11)[d]	1.68 (0.99-2.87)	5.57 (3.39-9.16)[d]	
Cannabis use[g]					
Never	1 [Reference]	1 [Reference]	1 [Reference]	1 [Reference]	$F_{8,159}$ = 6.35
Lifetime[b]	1.79 (1.27-2.51)[e]	1.59 (0.73-3.48)	1.56 (1.07-2.28)[f]	1.28 (0.52-3.15)	
1-2 times	1.31 (0.91-1.88)	3.11 (1.98-4.89)[d]	1.15 (0.78-1.70)	2.37 (1.43-3.92)[e]	
3-9 times	1.50 (0.84-2.67)	3.40 (1.82-6.33)[d]	1.24 (0.70-2.18)	2.67 (1.63-4.40)[d]	
≥10 times	1.69 (1.12-2.55)[f]	4.28 (3.05-6.02)[d]	1.27 (0.82-1.96)	3.17 (2.01-5.02)[d]	
Average grades, %					
90-100	1 [Reference]	1 [Reference]	1 [Reference]	1 [Reference]	$F_{8,159}$ = 6.35
80-89	1.23 (0.91-1.66)	1.60 (0.93-2.75)	1.18 (0.86-1.62)	1.41 (0.80-2.49)	
70-79	1.34 (0.95-1.89)	1.20 (0.65-2.19)	1.17 (0.82-1.66)	0.80 (0.44-1.46)	
60-69	2.38 (1.66-3.35)[d]	1.97 (0.96-4.04)	1.87 (1.33-2.65)[d]	1.01 (0.49-2.10)	
<60	4.98 (2.84-8.74)[d]	4.81 (1.77-13.06)[e]	3.93 (2.13-7.27)[d]	2.14 (0.82-5.60)	

[a] Data were derived from the Centre for Addiction and Mental Health's 2011 Ontario student drug use and health survey. Listwise deletion resulted in the following numbers and percentages of students: never (n=7193; 74.2%), lifetime (excluding past 12 months; n=1258; 20.2%), and past year (n=464; 5.6%).
[b] Lifetime excluded events occurring during the past 12 months.
[c] In complex samples, the degrees of freedom are calculated as follows: (number of schools) − (number of strata).
[d] Significant at 2-tailed $P<.001$.
[e] Significant at 2-tailed $P<.01$.
[f] Significant at 2-tailed $P<.05$.
[g] Reflects consumption during the past 12 months.

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CORRECTIONS

Language Error in Figure: In the Original Contribution entitled "Effect of Long-Detection Interval vs Standard-Detection Interval for Implantable Cardioverter-Defibrillators on Antitachycardia Pacing and Shock Delivery: The Advance III Randomized Clinical Trial" published in the May 8, 2013, issue of *JAMA* (2013;309[18]:1903-1911), the labels for each panel and the y-axes in both panels of Figure 3 were incorrect. This article has been corrected online.

Incorrect Location: In the Medical News and Perspectives article entitled "Lessons Learned From SARS Outbreak Prompt Rapid Response to New Coronavirus," published in the April 17, 2013, issue of *JAMA* (2013;309[15]:1576-1577), the incorrect state was given for an institution. The National Institutes of Health Rocky Mountain Laboratories is in Hamilton, Montana. The article has been corrected online.

