Injury Among YOUNG CANADIANS:



A NATIONAL STUDY OF contextual determinants

Editors:

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This report was produced by members of the CIHR Team in Child and Youth Injury Prevention, a unique collaboration of interdisciplinary researchers and partners who have a common purpose – to generate new knowledge for stakeholders who develop and deliver policy and programs, and advocate for children and youth in Canada.

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Injury Among Young Canadians: A national study of contextual determinants documents strong gradients in risk for injury by social, economic and contextual factors, as well as by several established individual risk behaviours. Many of the contextual determinants are linked to individual behavioural choices and the environments in which injuries occur. In addition to focusing on the individual, an ecological approach was taken to look at how injury relates to the environments or "contexts" where youth spend their time, including 1) home and family, 2) school, 3) with peers and, 4) features in young peoples' neighbourhoods.

This contextual information is foundational, and provides direction for the content and targeting of injury control efforts.

Key areas to celebrate:

- A large number of protective factors, at both individual and context levels, have been identified that reduce injury risks during youth. For example, in neighbourhoods where people feel they can trust their neighbours and where there are adequate spaces to spend free time, young people are less likely to report having a severe injury in the past year. Among older boys, having close male friends is a protective factor against injury. Among older girls, never misusing prescription drugs is a protective factor against injury.
- There is a significant number of youth who report not using alcohol, not smoking or using cannabis and who have peers who similarly abstain. These youth report the lowest risk for injury.
- Many neighbourhood characteristics that were related to severe injury risk can be modified.
- Many of the characteristics of the school setting that were associated with higher proportions of injuries were similar for all age and sex groups supporting the approach of school-wide interventions to prevent injury.
- While injury can be a negative consequence of sport participation, participating in sports has many positive effects on the health of youth. Supporting sports injury prevention efforts has the potential to greatly reduce injuries to youth.

Though injury prevention efforts have resulted in positive change, injuries continue to be a very important public health problem among Canadian youth. This report illuminated the following key insights:

- Factors related to the contexts, or environments, where young people learn, live and play have significant impact on their injury experiences.
- Patterns for injury vary by important subgroups of youth. This suggests potential health inequities among youth, such as those who reside in group homes or in foster care, students who are bullied, or students living in rural settings.
- Though it varies by age group and gender, at least one-third of all injuries are sports related, and one-half of all serious injuries are from driving or riding in a motor vehicle.
- In both grades 6-8 and 9-10, boys reported more injuries and more severe injuries than girls.
- Individual behaviours and activities such as smoking, drinking, impaired driving and illicit or prescription drug use elevate the risk of injury.

Key learnings emerged regarding the following categories:

Injuries at Home

- The proportion of students reporting home injuries increased as their community size decreased.
- Students in foster care, in particular boys in grades 9-10, reported many more home injuries.
- Going to school or bed hungry because there was not enough food at home was associated with home injury. Among boys in grades 9-10, those who frequently went to school or bed hungry were four times more likely to report being injured at home.

Socio-economic Status (SES)

- Individuals of lower SES report the highest incidence of injuries compared with those of average and high SES.
- Students attending schools in low SES neighbourhoods (those with high proportions of families with low income, less education or single parents) had a greater number of severe injuries.
- Girls of lower SES in all grades had a far greater risk of school injury compared with girls of higher SES.
- Boys in grades 9-10 living in neighbourhoods with high average household income had a greater proportion of severe injuries than girls and younger boys.

School-based Injuries

- Taken together, physical activities such as training for a sport, bicycling, skating, walking and running are mechanisms for a third of all severe school injuries.
- Boys and girls who were bullied reported higher proportions of school-based injuries, and had a greater risk of injury in all grades than those not bullied.



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Neighborhood Characteristics

- Social characteristics, including a lack of trust within the neighborhood, fear of being taken advantage of by neighbours, feeling there are no good places to spend free time, and that the neighbourhood is not safe place to play, were associated with a greater likelihood of severe injury.
- Physical characteristics of neighbourhoods that were associated with an increased likelihood of severe injuries included the absence of parks for boys and the presence of shabby buildings for girls.

Interactions with Peers

- Peers have a significant influence on a young person's injury risk. Youth who did not engage in risk behaviours such as alcohol use or smoking were still at increased risk for injury if their peers engaged in these activities.
- The proportion of youth who reported being injured increased as the frequency of participation in physical fighting increased.
- The more frequently a young person communicated and spent time with friends, the greater the injury risk.



• Among girls and younger boys, having close male friends appeared to increase the risk for injury.

Substance Use

- Injuries were more common among students who reported either illicit drug use or the misuse of prescription drugs compared with those who did not use drugs.
- Girls in grades 9-10 who used alcohol, prescription drugs or illicit drugs were more likely to be injured, and the greatest risk was associated with misuse of prescription drugs.
- Among boys and girls, the percentage of injured students increased as the frequency of binge drinking increased.
- Students who engaged in binge drinking reported sustaining more on- and off-road motor vehicle injuries than those who did not binge drink.
- The proportion of those severely injured in an on- or off-road motor vehicle collision was approximately double for those who reported being an impaired driver or a passenger of an impaired driver compared with those who were not.

Rurality

- Youth who resided in rural areas reported more injuries per capita than their urban counterparts.
- Boys in rural areas had the highest reports of driving a motor vehicle while drinking alcohol or using drugs.
- Fifteen percent of girls from small urban centres also reported impaired driving which was considerably higher than girls from large urban centres.

This report uses Canadian-specific data from the 2009-2010 cycle of the Health Behaviour of School-aged Children Study (HBSC) and included a total of 26,078 young Canadians in grades 6-10 from 436 participating schools. Nearly half of these youth reported a medically attended injury in the previous 12-months to the survey. These youth are the focus of this report. The purpose of this report is to raise awareness of adolescent injury issues and specifically highlight contextual factors that impact injury risk. These findings can be used to support critical evidence-based actions to prevent injuries in this population.



Summary Observations in Brief

As a summary and a call for action, specific observations for preventing injuries among Canadian youth have been made. We list the observations here, further detail surrounding the process of developing the observations and the content of each can be found in Chapter 9.

Observation 1:

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Injury remains a leading public health priority in terms of the prevalence of injury events reported, the extent and consistency of the problem observed in groups of young people across the country, the numbers of young people who seek formal medical care from the health care system, and in terms of the extensive amount of time lost from school or other usual activities.

Observation 2:

Comprehensive injury surveillance and injury prevention initiatives need to continue to monitor and evaluate outcomes and identify new and emerging patterns of youth injury.

Observation 3:

The role of government in injury prevention through the development and enforcement of good policy is essential.

Observation 4:

Efforts are needed to minimize the use of alcohol and drugs by youth. This includes efforts to address the culture that promotes alcohol and drug use, controlled regulation of alcohol sales, education on youth substance abuse and high-risk behaviours, and establishment of programs and services to address addictions.

Observation 5:

Injuries were more common among youth who reported illicit or prescription drug use, binge drinking or whose friends abused drugs or alcohol.

Observation 6:

Policies, programs and services that increase food security and reduce family dysfunction are important.

Observation 7:

Injury researchers need to collaborate with medical and social welfare professionals to better understand injury risks and social disparity risk factors leading to home injuries, particularly among youth in foster care, and develop concrete recommendations for injury prevention initiatives based on this understanding.

Observation 8:

Examining the relationship between characteristics of the school setting and injury risk is extremely important.

Observation 9:

Understanding the scope of youth injury in a community is important in order to implement and evaluate evidence-based injury prevention policies, programs and initiatives.

Observation 10:

Collaborations between those promoting physical activity and play, and injury prevention partners are essential to ensure safe, yet stimulating environments for healthy development.

Observation 11:

There is a need to work with youth to create safe physical environments where youth want to spend time.

Observation 12:

There is a need to continue to implement and support anti-bullying and anti-violence policies and programs that target perpetrators, victims and bystanders.

Observation 13:

Peer-mentorship programs that address the social context of the school environment and improve feelings of belonging and safety are needed.

Observation 14:

Understanding the fundamental determinants of youth injury is important, including surveillance to identify new patterns and trends, and interventions that target specific high risk and/or vulnerable populations, contextual determinants and risk and protective factors.

Observation 15:

Research programs are needed to improve understanding of the culture that promotes the use of alcohol, illicit and prescription drugs for recreational purposes, and the impact on child and youth injury patterns and rates.



Observation 16:

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Research programs are needed to implement optimal methods to prevent injury among high-risk and/or vulnerable youth, including those from rural and remote regions; investigate recurrent determinants and patterns of injury; social disparities; and, risk and protective factors.

Observation 17:

Research programs are needed to investigate the relationships between going to school or bed hungry and the increased risk for injury among youth, with a particular focus on policy solutions.

Observation 18:

Research programs are needed to illuminate understanding of the effects of various child and youth peer relationships and peer activities on injury risk.

Observation 19:

Research programs are needed to understand child and youth involvement in sports and social clubs as a protective factor against injury.



Chapter

Will Pickett Matt King Colleen Davison

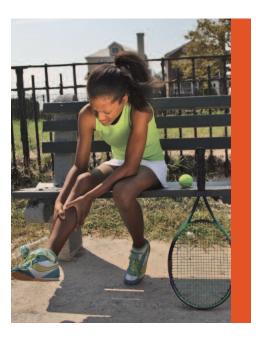
Introduction

As a group, young Canadians are among the healthiest people in the world. Overall, students report high life satisfaction and general health and, in recent decades, we have seen dramatic decreases in some health risk behaviours, such as smoking. However, there are children who are less fortunate in their experiences and suffer the consequences of risk-taking behaviours and other circumstances that threaten their immediate and possibly long term health.

Injury represents one of the most important negative health outcomes experienced by young people in Canada today. Injuries inflict a large burden on children and adolescents and their families and communities. This is true in Canada, as it is in countries around the world¹. Injury events are costly in so many ways, whether measured in terms of the toll inflicted upon society due to premature mortality, or the pain, disability, lost productivity and emotional consequence of non-fatal events.

National sources of data that describe the occurrence of injury in populations of young Canadians are rare. This is particularly true for data related to the early adolescent years, a time when many groups are particularly vulnerable to injury. One exception to this is the Canadian Health Behaviour in School-aged Children Study, or HBSC. HBSC is an international study of 11-15 year olds in 43 countries and involves a school-based health survey conducted every four years².

This report uses the Canadian-specific data from the most recent and current cycle of HBSC, conducted in 2009/2010, to provide a rare glimpse into what the injury problem looks like during the early adolescent years in Canada. It also explores and considers some of the more important underlying causes of this quiet epidemic.



Some History

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This report grew out of a unique collaboration between several national groups who are interested in the health of young Canadians.

HBSC Canada is the group responsible for the data source that underlies this national report. This group is an academic team coordinated by the Social Program Evaluation Group at Queen's University at Kingston, as well as professional colleagues from the Public Health Agency of Canada. It involves researchers, staff and students from Queen's, as well as McGill University in Montreal, and the University of British Columbia in Vancouver. HBSC is conducted every four years with collaborative funding and support from the Public Health Agency of Canada, as well as Health Canada. The study is conducted with close input from the Joint Consortium for School Health, as well as provincial and territorial authorities in the health and education sectors.



The broader team of authors who wrote the chapters in this report comes from the Canadian Institutes of Health (CIHR) Team in Child and Youth Injury Prevention, a collaboration of academic researchers and injury prevention specialists from across the country.

The above groups share a passionate interest in the prevention of injury, especially among children and young people.

Report Theme

Since its inception, HBSC has used population health theory as its basic framework. This means that the survey is designed to shed new light on various aspects of adolescent health, as well as their underlying determinants. In this report, we have extended this focus to include determinants of injury in populations of young people.

Determinants of injury operate at several levels. In its most simple form, population health theory suggests that characteristics of both the individuals and their environments contribute to the occurrence of injury events³. Sometimes these characteristics operate as individual risk factors, and sometimes they act together in an interactive fashion.

In applying this population health theory, we were particularly interested in individual risk factors such as basic demographic characteristics (for example, grade and sex) as well as behaviours that are known to put young people at risk. We were also interested in "contextual" and "area-level" factors. For adolescents, contextual factors include aspects of home, school, peer group and neighbourhood environments that protect young people from injury, or alternatively put them at higher risk for injury.

Our analysis also incorporates a basic "health equity" lens⁴, in that we searched for, and sought to identify, inequities in the injury experiences of different sub-groups of young people by, for instance, age, sex or urban/rural location. We were particularly interested in identifying groups who were especially vulnerable to higher risks for various types of injury.

In summary, the major themes of this report surround experiences of injury and severe injury and determinants of injury at individual as well as context levels. We were also particularly interested in looking at how these patterns may differ across age, sex or other population sub-groupings.

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Health Behaviour in School-Aged Children (HBSC)

The Health Behaviour in School-aged Children (HBSC) Study is a cross-national research study conducted in collaboration with the World Health Organization. The study involves health surveys conducted with students in classroom settings, with a focus on the early adolescent years (ages 11-15). HBSC is administered following a common research protocol².

Internationally, the HBSC study was first developed in 1982 by researchers from three European countries. The project has since expanded to be among the largest research networks of its kind, and page includes 42

its kind, and now includes 43 participating countries and regions and over 350 researchers. The most recent survey, the eighth in the cross-national series, was conducted in 2010. This represents the sixth cycle of the HBSC survey in Canada. The 2010 survey was the largest ever conducted in Canada, with a total of 26,078 young Canadians from 436 schools participating⁵.

Purpose

The main purpose of the HBSC study in Canada is to inform and influence health promotion and health education policy and programs, including injury prevention initiatives. Those involved in HBSC also aim to increase overall understanding of young people's health and well-being, and the factors that influence health. The HBSC team works with several core objectives. Those of particular relevance to this national injury report are as follows:



- 1. To conduct national research on health behaviour, health and wellbeing, and the social and physical contexts of youth.
- 2. To develop partnerships with other agencies who deal with adolescent health, in order to support health promotion efforts with populations of young people in Canada.
- 3. To inform policymaking and program development.



HBSC Methods

Sampling

In 2010, the HBSC Canada research team sampled students in grades 6 to 10 from across the country. In each of the provinces (with the exception of Prince Edward Island and New Brunswick), a systematic, cluster sampling approach was used to select whole classes of students to participate in the study. A list of schools within school jurisdictions was created from which schools in the sample were selected. The numbers of classes in specific schools were estimated based on the grades in the school, the numbers of teachers, the total enrolment, and enrolment by grade, depending on the information available. Classes were given an approximately equal chance of being selected and were ordered on the sample lists according to school and school jurisdiction, community size, and community location within a province, and stratified by language of instruction and public/Roman Catholic designation. Classes were selected approximately proportional to these characteristics. The school administrators, using directions provided by the research team, randomly selected the specific classes in the sample schools. The original sample of schools included an oversample to account for school jurisdictions declining to participate. Additionally, substitute schools and school jurisdictions were selected to replace those that declined to participate.

The 2010 sample does not include students from Prince Edward Island or New Brunswick. While unfortunate, their nonparticipation has little impact on national estimates, due to their relatively small populations and thus contribution to the national age-group population as a whole. In addition, private and special schools including on-reserve schools were also not included. This maintains consistency with past survey cycles but should be noted when interpreting findings presented in this report.

In addition to the sample collected in the eight included provinces, each of the three Canadian territories also participated. In Nunavut, Northwest Territories and Yukon, the sample consisted of all eligible students in grades 6 to 10. This sampling frame represented an attempt to obtain a census for the full student population, excluding private and special schools in the territories.

2010 survey notes

Response Rates. Response rates to the 2010 Canadian survey were 11/13 (84.6%) at the province or territorial level, 436/765 (57.0%) at the level of the school and 26,078/33,868 (77.0%) at the individual student level. Fewer than 10% of students declined to participate or spoiled their questionnaires intentionally. For the remaining non-participants, the most common reasons for non-participation were attributable to: failure to return consent forms, failure to receive parental consent, or absence on the day of survey administration.

Ethics. The survey protocol was reviewed and approved by an ethics review board at Queen's University, as well as a federal government ethics review board that serves both Health Canada and the Public Health Agency of Canada. Many of the individual school boards and jurisdictions from across Canada conducted their own ethics review process as well. Implicit or explicit consent processes varied by school jurisdiction, and the Canadian team followed existing local practices.

Weighting National Student Data. Due to the nature of the HBSC sampling approach, with oversamples in some provinces and an attempted census in the three Territories, results presented from the student data set are weighted. Each province or territory data set is weighted within the national file such that student responses from that jurisdiction contribute to the national results in proportion to the actual student population within the national grade group population. Effectively, provinces and territories that are over-represented in the student data file are given a weight of less than one, while provinces that are under-represented in the data set are given a weight greater than one.

The Canadian sample

The 2010 HBSC survey was administered in 436 Canadian schools. **Table 1.1** provides details surrounding the national sample of 26,078 students by grade and sex. For the purpose of our analyses, and because our grades of focus were 6-8, grade 5 students were counted in the grade 6 group and grade 11 students in the grade 10 group.

Table 1.1: Breakdown of the national sample, by grade and sex									
	Grade 5	Grade 6	Grade 7	Grade 8	Grade 9	Grade 10	Grade 11		
Boys	23 (41.8%)	2552 (50.0%)	2571 (49.5%)	2595 (49.4%)	2584 (47.9%)	2448 (50.3%)	105 (59.7%)		
Girls	32 (58.2%)	2551 (50.0%)	2624 (50.5%)	2662 (50.6%)	2809 (52.1%)	2420 (49.7%)	71 (40.3%)		
TOTAL	55	5103	5195	5257	5393	4868	176		

Table 1.2 further describes the number of participating schools,then students across the provinces and territories.

Table 1.2: Schools and students in the national sample,by province and territory							
	Sch	ools (%)	Stud	lents (%)			
British Columbia	55	(12.6)	3269	(12.5)			
Alberta	58	(13.3)	3573	(13.7)			
Saskatchewan	64	(14.7)	3307	(12.7)			
Manitoba	13	(3.0)	735	(2.8)			
Ontario	69	(15.8)	3692	(14.2)			
Quebec	57	(13.1)	3476	(13.3)			
Nova Scotia	11	(2.5)	611	(2.3)			
Newfoundland and Labrador	29	(7.7)	3473	(13.3)			
Yukon	28	(6.4)	1422	(5.5)			
Northwest Territories	31	(7.1)	1688	(6.5)			
Nunavut	21	(4.8)	832	(3.2)			
TOTAL	436	(100)	26,078	(100)			



Student questionnaire

Student questionnaires were administered in classroom settings during one 45-70 minute session. In a very few instances, where students' level of literacy was an issue, classes used more than one class period to complete the survey. In 2010, only paper versions of the survey were employed in order to maximize privacy and ensure adherence to the international protocol. Survey items covered a wide range of topics related to

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this health survey on behalf of the World Health teach us more about what students your age health. Students in Grades 6, 7, 8, 9, and 10 are
tely voluntary. If you do not want to answer taire in the envelope and place it on your desk te survey, you may stop at any time. Choosing t your grade in this class.
answer some of the questions. While you are sk about them or look at the answers of your the questionnaise. When you have finished, nd seal the envelope. No one from your school it Queen's University will not be able to identify
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wer each question by placing a check mark ()<br you will be required to write in the space

health and health determinants.

The survey instrument includes a core set of approximately 120 mandatory items developed by the HBSC international network and used by all participating countries. The Canadian questionnaire included additional optional items agreed on in Canada by federal government partners, representatives of the Joint Consortium for School Health, and members of the core research team.

There are two versions of the Canadian questionnaire, one for grades 6 to 8, and another for grades 9 and 10. The questionnaire for the higher grades contains all the items on the grades 6 to 8 version, as well as additional items related to substance use and sexual health deemed only appropriate for older students. The questionnaire was made available in English, French and Inuktitut. Implicit or explicit consent procedures were followed, as per local school board policy.

Injury measures

The international HBSC injury module contains a series of questions that are used to document the number of injuries experienced by each participant during a one-year recall period. A series of supplemental questions ask about the one most severe injury event that occurred over the time period. These focus on the external causes of injury (when, where and how it happened), and its consequences (medical treatment and times lost from school or usual activities). Additional questions contained in the Canadian module relate to engagement in behaviours known to be associated with severe injury (potential impaired driving, helmet use on bicycles and off-road vehicles). Note, intentional injuries, such as self-harm or suicidal acts, could be included in our measures of injury, but are likely under-reported. They can not be differentiated from other kinds of injury using the available measures.

Contextual measures



In addition to the student questionnaire, one administrator (principal or assistant principal) from each school was also asked to complete and return a school-level questionnaire. This covers a basic description of the school, its neighbourhood environment, its programs and facilities, and its student body. Administrator questionnaires were completed by representatives from 407 of the 436 (93%) participating schools.

In addition to the administrator guestionnaire, researchers from HBSC Canada received operating grant support from CIHR to map the geographic neighbourhood surrounding each participating school. These maps in turn were related to measures from the Canada Census of Population⁶ and various geographic information systems to richly characterize the geographic neighbourhoods surrounding each school.



200 m

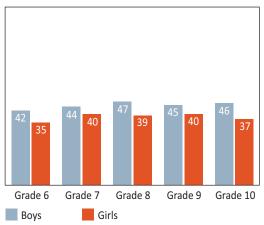
The Analysis

Descriptive analysis

Most of the analyses in this report are basic and descriptive. Findings are mainly presented as percentages in bar chart format, stratified by grade level and sex. For clarity and following accepted precedents for policyoriented audiences, we have intentionally chosen not to present confidence intervals and/or p-values, although these are certainly available upon request. The primary purpose of the descriptive analysis is to present major patterns and trends. Due to the very large sample sizes involved, when using the full sample, all differences in proportions of 3% or more can be considered to be statistically significant at a level of more than 95% confidence (p<0.05). In analyses where the full sample is stratified by grade level and sex for example, differences in proportions of 4% or more will be statistically significant at the same confidence level.

This is an example of the type of figure that is most often used in this report (Figure 1.1). Along the vertical (Y) axis is the percent of students reporting a medically treated injury in the last 12 months, and along the horizontal (X) axis the data are presented by specific sub-groups (grade and sex, for example). Here, data for girls are presented in orange, for boys it is in grey. We see that higher proportions of boys than girls have at least one medically-treated injury in the past 12 months.





Risk factor analysis

Some analyses presented in this report go beyond descriptive findings and present formal summaries of associations between injuries and health determinants. In doing so, possible risk or protective factors for injury are identified. These analyses are based upon multi-level regression models that account for the clustered nature of the survey design (recognizing that students in a similar class or school may have more similar injury experience than students in other classes or attending other schools). We also adjust for imbalances in other important factors, that may influence injury susceptibility, and also consider the fact that some predictors are individual factors while others are area-level (contextual) factors. Where these kinds of statistical models have been used, details to aid interpretation are included.

Report objectives

- 1. To profile the magnitude and scope of the injury problem among young people in Canada.
- 2. To describe common patterns of injury in populations of young people across Canada.
- 3. To examine determinants of injury in young people, considered at both the individual student and also contextual (home, school, peer group and neighbourhood) levels.
- 4. To apply major report findings to national recommendations for the prevention of injury to young Canadians.

Intended audience

While this report will be of interest to many different groups, the main intended audiences are policymakers and professionals involved in injury prevention initiatives from across Canada. The findings, language and layout of the report were created with this audience in mind.

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Injury in Young People: An Overview*

Injury is defined as any physical harm to the body typically caused by an external force. The most common causes of injury are physical forces, and in young people these often happen while playing sports, during motor vehicle collisions, while cycling, or during physical fights¹. In our definition, injuries can also include poisoning and ingestions, as well as burns. Intentional injuries, such as self-harm or suicidal acts, could be included but are likely under-reported.

Why Does Injury Matter to Populations of Young People?

Injury is recognized as a leading public health issue in populations of young people around the world². This is certainly the case in Canada. For example, 38% of all Canadian young people report a medically treated injury each year, and nearly one in four Canadian youth will require an overnight hospital stay or will lose more than one day of regular activities due to injury¹. Injuries are also costly to society in terms of health care expenditures and time lost from productive activities for both adolescents and the adults who care for them when they are injured²⁻⁴.

Possible Relationships Between Injury and Young People's Health

While injuries may cause obvious physical health effects such as pain and disability, the extent to which injuries may relate to other aspects of health is not well known. Recovery from injury can be a challenging process. Not only may injured youth experience ongoing pain and inconvenience, they may be prevented from engaging in their usual activities such as sports, music, and other recreational activities. These life changes are not trivial, and they may take a significant emotional toll. It is also possible that a young person's health status may impact risks for injury. For these reasons, it is important to examine associations between various types of injury and a variety of health indicators.

What are We Reporting in this Chapter?

In this chapter, we report the percentage of students who experience at least one injury in a year, the percentage of those who experience multiple injuries, and seriousness of these injuries. We define injuries as any injury event reported in the last 12 months that resulted in treatment by a doctor or nurse. One year represents the standard time period over which it is believed that young people can recall their injury experiences accurately⁶. We define serious injuries as those that resulted in significant medical treatment

^{*} Parts of this chapter are adapted from the HBSC National Report The Health of Canada's Young people: A mental health focus (PHAC, 2012).

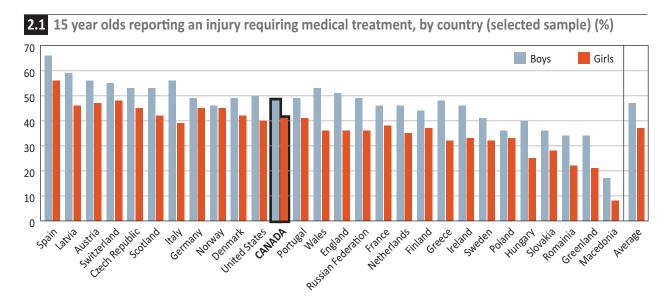
such as the placement of a cast, stitches or an overnight admission to hospital. We also describe severe injuries as those injuries that led to at least five days missed from school or usual activities. We describe patterns of injury by certain population sub-groups such as by grade level, sex or whether a young person lives in a rural or urban setting. We also describe whether the problem of serious injuries is getting better or worse in young people as a group, compared with past HBSC surveys. Common activities where the injury occurred are highlighted. Finally, the burden of injuries is reported in terms of time lost from school or other usual activities.

Description of the Injury Problem

The size of the injury problem in Canada

The international nature of HBSC enables comparison of Canadian young people's injury experiences to those reported in 42 mainly European countries. The sample is typically broken down into age groups and by sex.





2.2 Students reporting an injury requiring medical treatment (%)

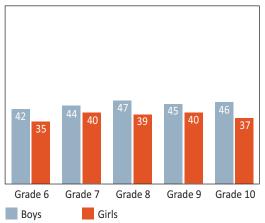


Figure 2.1 describes proportions of 15 year-olds who reported at least one injury in the past 12 months. Canadian 15-yearold girls reported higher than the international average in the proportion sustaining injuries, while the boys were average. This pattern holds true for 13-year olds, but for 11-year-olds, Canadian boys and girls are both similar to the HBSC average.

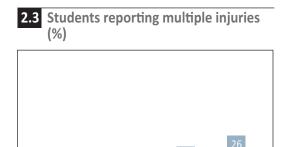
Figure 2.2 shows the overall proportions of students who reported at least one injury in the past 12 months. Across the grades, 42 to 47% of boys reported experiencing at least one injury requiring medical treatment, compared with 35 to 40% of girls. In every grade, boys reported more injuries than girls. There was no strong observable pattern in the occurrence of injuries across the five grades.

For Canada the differences in proportion of injured boys and girls range from 6 to 9 % across the age groups. For approximately half of the HBSC countries, this sex difference was over 10 percent and ranged as high as 28 %. These are undoubtedly related to different levels of exposure to risks that exist between the two sexes.

20

Grade 10

Grade 9



Grade 8

Grade 6

Boys

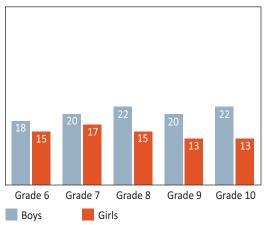
Grade 7

Girls

Some young people reported experiencing more than one injury over the course of a year, and this is shown in Figure 2.3. For Canada, reports of multiple injuries ranged from 20 to 26% for boys and 16 to 21% for girls. In general, there was not a strong pattern, but there were differences across grades. These findings were quite similar to past cycles of the HBSC.



2.4 Students reporting one or more serious injuries requiring significant medical treatment (%)

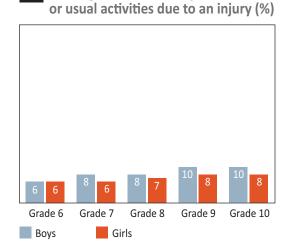


Consistent sex patterns can also be seen for more severe injury events. Figure 2.4 shows that at each grade level, a greater proportion of Canadian boys (18 to 22%) compared with girls (13 to 17%) reported an injury requiring placement of a cast, stitches, surgery, or an overnight admission to hospital in the past 12 months.

Impact of Injury on Young People's Lives

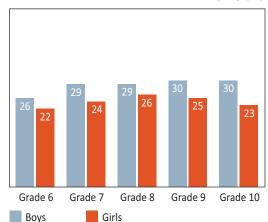
The impact of students' injuries extends beyond their immediate physical consequences. In 2010, about one in four Canadian students typically missed one or more days of school or other usual activities due to an injury (Figure 2.5).

Between 6 to 10% of students reported missing 5 days or more of school or usual activities due to an injury (Figure 2.6).



2.6 Missing five or more days of school

2.5 Missing one or more days from school or usual activities due to an injury (%)

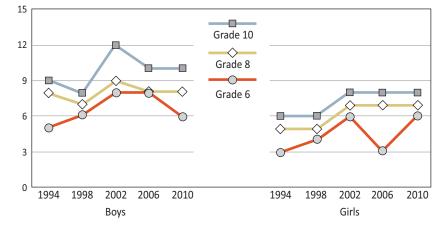




Trends in Injury Over Time

Trends in the occurrence of serious injuries reported by young Canadians are summarized in Figure 2.7. There was no clear trend in the occurrence of reported injuries across the five HBSC survey cycles representing 16 years. This is despite the fact that injury has been recognized as an important public health issue in Canada, and considerable resources have been put into prevention efforts. This is of obvious concern to public health officials in Canada.

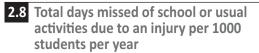
2.7 Injuries resulting in five or more days lost from school or usual activities reported over the last five cycles of the HBSC survey (%)

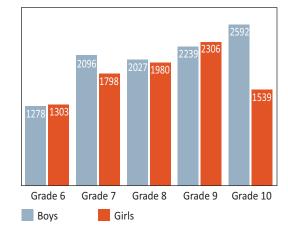


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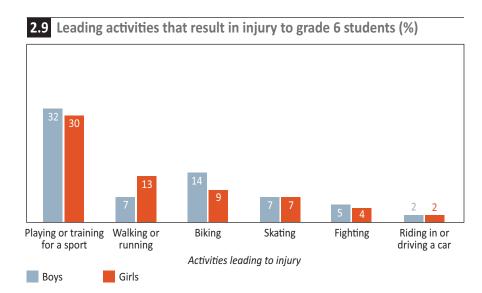
Figure 2.8 describes the burden of injury in the Canadian HBSC sample, estimated per 1000 participating students. For example, for every 1000 grade ten boys that participated, 2592 days were lost per year (almost 2.6 days per participant). Cumulatively, these injury events resulted in an enormous amount of time lost to students in all grades.

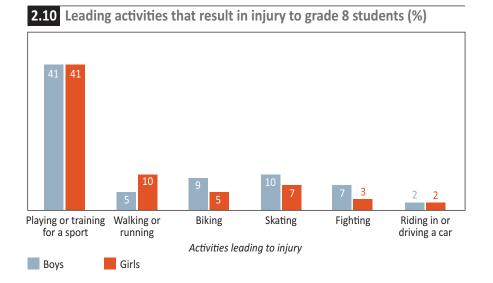


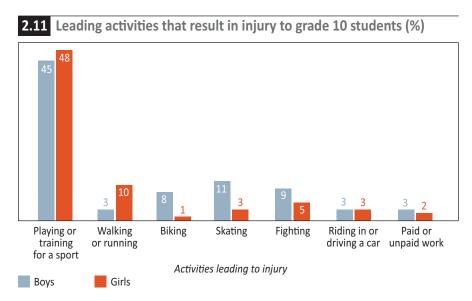


How are Young People Injured?

Injuries to young people occurred during many different activities. **Figures 2.9** to **2.11** show that sports and recreation activities are leading causes of injury in Canada. While fighting injuries are less common, the effects of violence on overall health will likely be more serious than the effect of recreational injuries due to the emotional impact of the violent event. Similarly, while motor vehicle injuries and occupational injuries account for smaller percentages in all age groups, they are still notable because they can be traumatic and disabling.







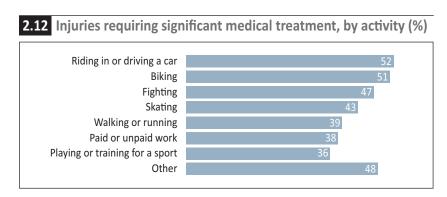
Where are Young People Injured?

Table 2.1 shows that the leading places where injuries to young people in Canada occurred. This includes, at home (in a house or yard, 15 to 36%), sports facilities or fields (21 to 41%), and at school during regular hours (12 to 19%). Injuries at sports facilities increased in older grades, while injuries that happened at home or in in schools, during school-hours, declined with age.

Table 2.1: Locations where injuries happen, by grade and sex (column %)										
	Grade 6		Grade 7		Grade 8		Grade 9		Grade 10	
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Home or yard	27	36	27	27	18	26	18	25	15	22
Sports facility or field	27	21	31	27	39	30	39	37	41	36
School during school hours	19	19	15	16	13	18	14	12	12	13
School outside hours	3	3	3	5	4	5	5	4	5	7
Street or parking lot	6	4	7	7	9	6	9	7	9	5
Other	17	17	18	17	17	15	16	15	19	17

Which Activities Lead to the Most Serious Injuries?

Figure 2.12 shows that the types of injury-causing activities most likely to lead to significant medical treatment (any of placement of a cast, stitches, or an overnight admission to hospital) include motor vehicle injuries, cycling injuries, and fighting. This is consistent with what is known about major causes



of adolescent injury that result in death or hospitalization. While less common than sports injuries, these types of injury are important due to their relative severity.

What Young People Thought About Injury

The topic of injury was discussed extensively in a 2011 workshop with young people from across Canada. While young people appreciated the importance of injury as a public health problem, their views on its relative importance might vary somewhat from adults, especially adult professionals who are responsible for the development of injury prevention programs. The immediate consequences of injuries in terms of pain, suffering, and inconvenience seem to be understood, at least conceptually. Nevertheless, the longterm costs of injury in terms of its effects on society appear to be less well understood by young people.



Injuries happen, they are part of life, part of growing up. I don't want to give up playing soccer or basketball or hanging out just because I might get hurt. But I do understand the need to be careful ... to be smart about the risks that I take.

-Youth, 2011 HBSC Healthy Advice Workshop

Summary and Implications

Key issues of concern

- 1. Injuries continue to be a very important public health problem in Canadian youth.
- 2. Patterns for injury vary by important sub-groups of young people. These suggest potential health inequities.

Key issues to celebrate

- 1. The leading activity associated with the occurrence of injury to young people remains "playing or training for a sport". This indicates participation of young people in these activities and this should be celebrated.
- 2. While injury can be a negative side effect of sport participation, participating in sports also has a positive effect on the health of young people.

Closing Thoughts

Injury remains a leading public health priority in terms of the prevalence of injury events reported, and the extent and consistency of the problem observed in groups of young people across the country.

Injury also exacts a significant toll in terms of both the number of young people who seek formal medical care from the health care system, and the extensive amount of time lost from school or other usual activities.

These facts are well understood by Canadian authorities, including the Public Health Agency of Canada which has identified injury as one of its leading priority health issues during recent years^{4,5}.

Due to the enormous burden of injuries in terms of pain and suffering, permanent disability and even death, the Government of Canada has identified injury as a major prevention priority^{4,5}.

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Introduction

The purpose of this chapter is to explore risk and protective factors for injuries among young people in grades 6-10. While all children and youth are at risk for injury, the level of risk is not the same for everyone. Some characteristics and behaviours may increase or decrease risks for injury. For this report, risk and protective factors are defined as individual characteristics, events or behaviours that increase or decrease the likelihood of injury. For example, are students who wear bike helmets, smoke or play sports more, or less, likely to report being injured than those who do not?

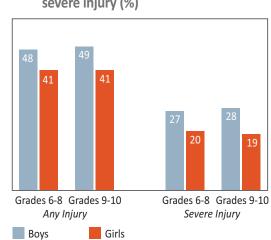
We examine several types of risk and protective factors in this chapter, including demographic factors (e.g., sex, grade level and living in urban/rural settings), social factors (e.g., living arrangements, immigration status, and socioeconomic status (SES); common high risk behaviours (e.g., smoking, binge drinking, drug use, physical fighting and impaired driving). We determine if some of these factors are associated with the occurrence of "any injury" and any "severe injury" as defined in chapter 2. We also explore whether some of these factors are associated with "any sport injury" since many children and youth are injured while participating in sport and recreation activities. For this report, "any sport injury" is defined as those injuries that occur specifically

when a student is playing or training for a sport or recreational activity. It should be noted that while sport participation may result in a sport-related injury, sports and physical activity are an important factor in physical and mental well-being.

Demographic Factors and Injury

Grade level and sex

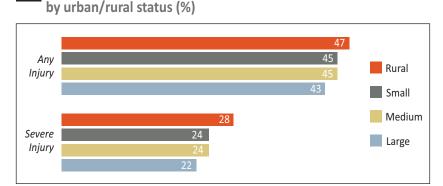
Overall, more than four in ten students reported having an injury and one in four students reported experiencing a severe injury. As shown in **Figure 3.1**, a greater proportion of boys than girls reported having an injury or severe injury in the last 12 months, regardless of their grade.



3.1 Students reporting any injury and severe injury (%)

City or town size

Based on the population size of the city or town where they attended school, students were categorized as living in a large (>100,000 population), medium (20,000-99,999 population), small population centre (1,000-19,999), or a rural location (<1,000). The proportion of students reporting an injury increased as the size of the center decreased. This pattern was observed for both injury outcomes (Figure 3.2).



3.2 Students reporting any injury and severe injury

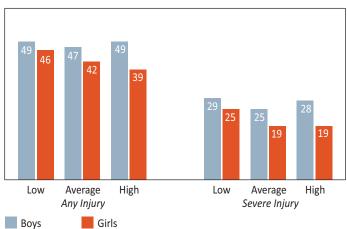




Socioeconomic status

Students were also asked how well off they thought their family was (from very well off to not at all well off). The responses were classified as self-reported high, average and low SES. There were strong differences in the occurrence of injury and also severe injury reported by SES by girls, but this pattern was not apparent for boys (Figure 3.3).



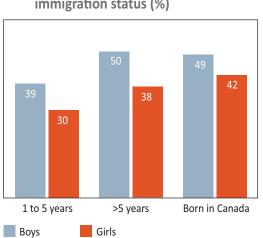


Living arrangements

There is great variety in family living arrangements reported by Canadian students. Young people may, for example, live with both parents, one parent, an extended family, or have two homes and two families. We found no relationship between the number of adults in the home and percentage of students reporting an injury or severe injury. However, larger percentages of younger girls and older boys residing in group homes or foster care reported more injuries and severe injuries than their peers who were not in foster care (**Figure 3.4**).



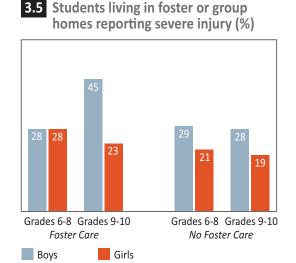
With the exception of boys in grades 6-8, there was also a higher proportion of severe injuries among those in foster care compared with their peers (Figure 3.5). Forty-five percent of boys in grades 9-10 living in foster care reported having a severe injury compared with only 29% of their peers not in these living situations.



3.6 Students reporting any injury by immigration status (%)

3.4 Students living in foster or group

homes reporting any injury (%)



Length of Time in Canada

Immigrating to a new country represents an important life transition that may impact health, including injury experiences. Figure 3.6 compares students who were recent immigrants (1 to 5 years in Canada), longer-term immigrants (over 5 years in Canada), and those born in Canada. Of these groups, recent immigrants to Canada reported the lowest levels of injury occurrence. The protective effect of recent immigration appears to be lost after living in Canada for more than five years. This pattern was present for both boys and girls across grade levels, and the same pattern was observed for severe injury.

High-Risk Behaviours

Common high-risk behaviours can have negative effects on young people's overall development and well-being, and these behaviours can also be associated with injury occurrence. The HBSC survey collects information on common risk behaviours including smoking status, binge drinking, drug use (including cannabis, prescription, and other illicit drug use), impaired driving, physical fighting, and being bullied. We have explored these behaviours and their relationships to injury.

status (%)

Cigarette smoking

Students who occasionally smoked cigarettes reported the highest proportion of any injury (57%) compared with nonsmokers (43%) and daily smokers (52%). The same pattern was observed among boys and girls (**Figure 3.7**). Similarly to any injuries, severe injuries were least common among non-smokers (22%). However, daily cigarette smokers reported the highest proportion of severe injuries.



Alcohol consumption

Questions about the frequency of alcohol consumption in the last 12 months were asked of grades 9-10 students only. Binge drinking was defined as having five or more drinks during one occasion for boys, and four or more drinks during one occasion for girls. Students were categorized as binge drinking "often" if they reported this behaviour more than twice a month, and "sometimes" if they reported it once a month or less than once a month. Among

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 40
 61
 53
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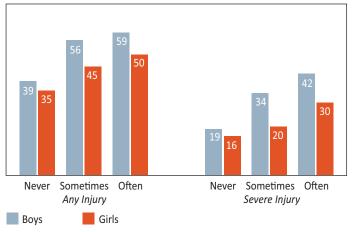
 40
 40
 53
 55
 50
 26
 18
 41
 43
 35

 Non Occasional
 Daily
 Non Occasional
 Daily
 Severe Injury

 Nonsolver
 Any Injury
 Severe Injury
 Severe Injury

3.7 Students reporting any injury by current smoking

3.8 Grades 9-10 students reporting any injury and severe injury by frequency of binge drinking (%)



boys and girls, the percentage of injured students increased as the frequency of binge drinking increased, as shown in **Figure 3.8**. A greater percentage of boys consistently reported being injured, regardless of injury severity or frequency of binge drinking. Overall, 54% of frequent binge drinkers reported an injury and 36% reported a severe injury. These findings were notably higher than students who reported never binge drinking.

Drug use

Grades 9-10 students were asked about three types of drug use in the last 12 months: cannabis, prescription drugs (pain relievers, stimulants, and sedatives), and illicit drug use (cocaine, ecstasy, methamphetamine, etc.). Injuries were more common among students who indicated any kind of drug use compared with those who did not use drugs (Figure 3.9). The overall proportion of injuries was highest for misuse of prescription drugs (61%) and lowest for cannabis use (53%). The same pattern was observed for the different types of drugs and severe injuries.

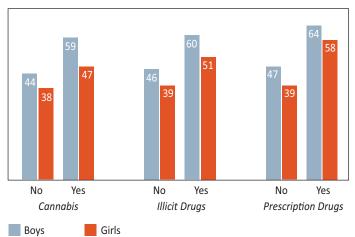
Impaired driving or passenger of an impaired driver

Driving a motor vehicle while under the influence of alcohol or drugs is an obvious and serious cause of major injury in Canada. Therefore, it is disturbing to see that substantial proportions of boys and girls reported riding in a motor vehicle in the past 30 days that was driven by someone who had been using drugs or alcohol. **Figure 3.10** presents the

percentages for grades 9 and 10 students, who reported this behaviour most frequently. This was especially a problem in rural student populations.

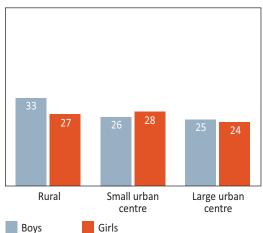
Equally disturbing are the proportions of grades 9 and 10 students who reported driving a motor vehicle when they themselves had been drinking alcohol or using drugs. Again, the highest reports of this behaviour were observed among boys in rural areas (Figure 3.11). However, 15% of girls from small urban centres also reported this behaviour, which was considerably higher than girls from large urban centres.

3.9 Grades 9-10 students reporting any injury by drug use (%)





3.10 Grades 9-10 students reporting riding in a car or other vehicle in the past 30 days driven by someone who had been drinking alcohol or using drugs (%) by location



28

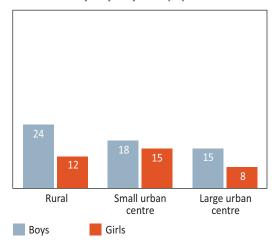
Impaired driving is a serious yet preventable risk factor for motor vehicle injury. Grades 9-10 students who reported impaired driving in the last 30 days as either a passenger or driver had a higher proportion of having a motor vehicle injury or severe motor vehicle injury over those who did not (Figure 3.12). The proportion of injured students was slightly higher for drivers than passengers. Also, the proportion of those severely injured in a motor vehicle collision was approximately double for those who reported being an impaired driver or a passenger of an impaired driver compared with those who were not. In total, 1.7% of students who indicated participating in impaired driving as either a driver or passenger reported any motor vehicle injury versus 0.9% who did not engage in this behaviour. Only 0.5% of students who did not engage in impaired driving reported any motor vehicle injury, while 0.9% of impaired drivers or passengers endured a severe motor vehicle injury. This represents an almost doubling of risk of a motor vehicle injury when the driver is impaired.

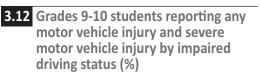
Exposures to these potential impaired driving behaviours were not innocuous. For example, young people who reported riding frequently as a passenger in a vehicle being driven by someone who had used drugs or alcohol also reported 1.7 times the risk for having a motor vehicle injury, relative to those who never engaged in such behaviours. Frequent driving of a motor vehicle after using drugs or alcohol was associated with 2.4 times the risk for related injury¹.

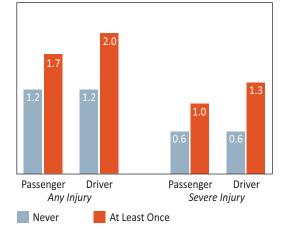
Physical fighting

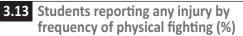
Students were asked how many times they were in a physical fight during the past 12 months. Those who reported fighting on more than three occasions were considered to have engaged in this behaviour "often". We found that the proportion of youth reporting being injured from any cause increased. Among students who physically fought, students in grade 9-10 report more injuries than grades 6-8 students (Figure 3.13). In total, 40% of grades 6-8 students and 47% of grades 9-10 students who often fought sustained a severe injury.

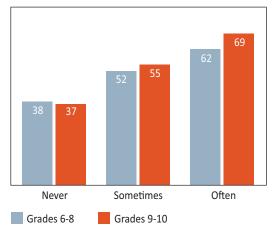
3.11 Grades 9-10 students reporting driving a vehicle after drinking alcohol or using drugs in the past 30 days by city size (%)







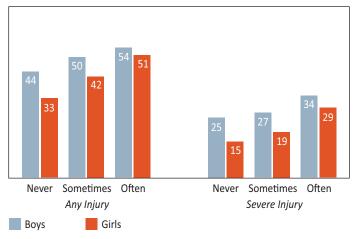




Bullying

Bullying is an important issue facing today's young people. Overall, the proportion of children being injured increased as the frequency of bullying increased: 39% injured who were never bullied, 46% injured who were sometimes bullied, and 53% injured who were often bullied. Boys consistently reported more injuries than girls but the gap narrows among students who were often bullied (**Figure 3.14**). A similar pattern was observed for severe injuries.

3.14 Students reporting any injury and severe injury by frequency of bullying (%)





Activities

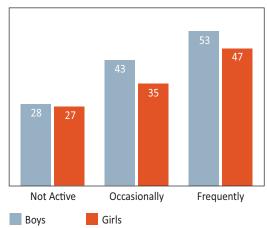
While participation in physical activity and sport is important to the physical, mental and social development of children and youth, it also increases the risks for injury. Students were asked how many days they engaged in physical activity for at least 60 minutes over the past seven days and how many days they engaged in physical activity for at least 60 minutes during a typical week. Note, the Canadian physical activity guidelines recommend 60 minutes per day, seven days per week. Students who reported being active on average less than twice a week were considered "not physically active", those who reported two to four days of being

active were classified as "occasional" participants, and those who reported more than four days of activity were considered to be "frequent" participants.

Physical activity

The percentage of students reporting any injury increased as the frequency of physical activity increased (Figure 3.15), with boys consistently reporting more injuries than girls. Approximately 27% of physically inactive students reported any injury while almost double (50%) the frequently active students reported any injury.

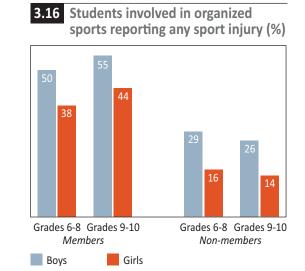
3.15 Students reporting any injury by level of physical activity (%)

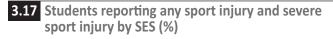


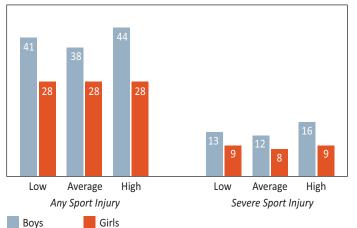
Organized sports

Students who indicated that they were members of a sports club or team reported a higher proportion of sports-related injury than non-members. This was observed among both boys and girls across grade levels as shown in Figure 3.16.

Sport injuries are common among children and youth. Figure 3.17 indicates that a similar percentage of female students reported having a sport injury, regardless of SES. However, boys of high SES suffered the highest proportion of sport injuries. The same pattern was observed for severe sport injuries and SES.







Statistical Modelling of Protective Factors for Injury

In addition to the descriptive findings presented to this point, we also modeled relationships between factors that potentially protect young people from injury, and their reported injury experiences. This modeling is helpful because it quantifies the strengths of relationships, but also mathematically controls for other factors that could predict injury occurrence.

Table 3.1 lists a variety of factors that reduce the risk of injury. For example, for boys in grades 6-8, those who never report being in physical fights experienced a 53% reduction in the risk for any injury, 54% for severe injury and 30% for sports injury. This reduction in risk is relative to those that did report being involved in physical fights.

Regardless of grade level or sex, not being in physical fights, not being bullied, not being physically active or being a member of a sports club, and not engaging in high risk of activities protect against any injury and severe injury.

Table 3.1: Factors that <i>reduce</i> the risk of any injury, severe injury, and sport injury after adjusting for other factors					
Preventitive Factors	Any Injury Risk Reduction	Severe Injury Risk Reduction	Any Sport Injury Risk Reduction		
Boys Grades 6-8					
Never in physical fights	53%	54%	30%		
Never bullied	34%	35%	21%		
Never a passenger driven by impaired driver	23%	37%	21%		
Not physically active	51%	31%	39%		
Not a sports club member	42%	31%	57%		
Girls Grades 6-8					
Never bullied	45%	37%	25%		
Never in physical fights	59%	47%	*		
Not physically active	47%	*	28%		
Not a sports club member	45%	42%	71%		
Boys Grades 9-10					
Never in physical fights	54%	51%	*		
Not physically active	66%	36%	39%		
Not a sports club member	41%	46%	57%		
Never a passenger driven by impaired driver	23%	*	37%		
Sirls Grades 9-10					
Never in physical fights	72%	46%	*		
Never bullied	39%	55%	55%		
Not misusing prescription drugs	38%	65%	33%		
Not physically active	51%	51%	30%		
Not a sports club member	56%	52%	78%		

* Results were not statsitically signficant.

Summary and Implications

This exploration of injury risk factors provides an opportunity to highlight patterns that are representative of the Canadian youth population. It is important to note that the identified risk factors are associated with an increased injury risk only and are not necessarily representative of a cause and effect relationship, as injuries and their potential predictors were assessed at a single point in time.

Demographic factors

In almost all instances, boys reported more injuries than girls and this is consistent with other studies². Injury patterns across urban and rural populations are also consistent with much of the literature, such that individuals residing in rural areas reported more injuries than their urban counterparts³.

Social factors

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SES remains an important factor that is associated with injuries and decreased SES increases the risk of injury⁴. Individuals of lower SES report the highest incidents of injuries compared with those of average and high SES. Immigration status is also associated with reported injuries. Regardless of injury severity, recent immigrants (less than 5 years in Canada) report fewer injuries. However, this pattern is not sustained, as immigrants in Canada for more than 5 years report similar patters to those born in Canada.



High-risk behaviours

Drug use, smoking, drinking and engaging in bullying and fighting were all identified as factors that increase injury risk. Injuries were more common for students who reported drug use compared with those who did not use drugs. Students who occasionally smoked cigarettes reported the highest proportion of any injury compared with non-smokers and daily smokers. Students who engaged in binge drinking reported more motor vehicle injuries than those who did not and the effects of alcohol on driving performance are well established⁵. Grades 9-10 students who engaged in physical fighting reported more severe injuries than grades 6-8 students. The proportion of students sustaining injuries increased as the frequency of bullying increased.

Activity

The percentage of students who report sustaining any injury is strongly related to the frequency of physical activity, which is consistent with other studies⁶. Approximately twice as many students who were physically active reported any injury compared with those who were not physically active. Sports specific injuries were more common for students who were members of a sports club or team. Given the many benefits of physical activity and sport participation, it is encouraging that students are participating in organized sports and increasing their physical activity beyond physical education classes offered in schools.

Key issues of concern

- 1. Young people engage in many behaviours and activities that put them at risk for injury.
- 2. More boys than girls sustain injuries, and it appears this is associated with an increased level of risktaking in boys.
- 3. There are specific vulnerable groups of interest, including young people who reside in group homes or foster care, students who are bullied and students living in rural settings.

Key issues to celebrate

- 1. This examination of patterns in injury occurrence by age, sex and other factors provides insight into mechanisms for injury that can help inform intervention development.
- 2. A large number of protective factors have been identified that reduce injury risks in young people.
- 3. Several of the risk factors for injury are modifiable, such as participation in high-risk behaviours.
- 4. While participation in physical activity increases injury risk, there are also many positive reasons to be involved in sport activities. The positive effects of physical activity include many physical health benefits (e.g., cardiovascular fitness, reduced likelihood of obesity) and improved mental wellbeing (e.g., sense of belonging from team sports, improve self-confidence, stress management).

Closing Thoughts

Injury is an important health issue for Canadian youth. This chapter provides a unique opportunity to highlight risk and protective factors that can be targeted to reduce the injury burden. While eliminating the possibility of injury entirely is an unrealistic goal, targeted approaches focusing on modifiable factors through partnerships across sectors is an important step to reducing child and youth injury in Canada.

Behaviours and activities such as smoking, drinking, impaired driving and drug use elevate the risk of injury. As such, programs targeted to reduce these activities, individually and collectively, are important avenues to consider for injury prevention.

Although sport participation increases injury risk, physical activity is important for overall health and wellbeing. Physical activity is not only important during childhood and adolescent, but can have long lasting effects because children and youth who are physical active are more likely to become physically active adults⁷. Physical activity can also reduce the risk of diabetes⁸, heart disease⁹, and some cancers^{10,11}. It is important to encourage participation along with safety, such as promoting cycling together with helmet use¹².



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Colleen Davison Atif Kukaswadia

Chapter

Considering the Context of Youth Injury in Canada*

Introduction

The Public Health Agency of Canada has identified a list of 12 key determinants of health (Table 4.1) that are independent contributors and factors that also interact to produce various states of health and disease in individuals and populations.

...health is influenced by the interaction of individual behaviours and environmental factors in the social and physical environments where young people "live, learn, work, and play"¹

Many of these determinants are not linked to an individual's genetics or lifestyle choices, but driven by their environment. And so, in addition to a focus on the individual, it is important for us to look towards the environments or "contexts" where people spend their time,

Table 4.1: Key determinants of health

- 1. Income and Social Status
- 2. Social Support Networks
- 3. Education and Literacy
- 4. Employment/Working Conditions
- 5. Social Environments
- 6. Physical Environments
- 7. Personal Health Practices and Coping Skills
- 8. Healthy Child Development
- 9. Biology and Genetic Endowment
- 10. Health Services
- 11. Gender
- 12. Culture

if we are to fully understand what determines health and ill-health. The HBSC Study is built upon population health theory that suggests that health is influenced by the interaction of individual behaviours and environmental factors in the social and physical environments where young people "live, learn, work, and play"¹. In this "ecological approach", health is thought about as being determined by many factors within, and outside individuals².

* Parts of this chapter are adapted from the HBSC National Report The Health of Canada's Young people: A mental health focus (PHAC, 2012).

In youth, context exerts its influence though 1) home and family environment, 2) the effects of the school, 3) the influence of peers and, 4) the impact of the neighbourhood. Each of these environments holds unique "contextual determinants" of injury. Chapters 5-8 of this report look at these four different contexts and explore how factors in these environments may affect injury experiences in young people.

The Home and Family Context

The family plays a central role in the socialization of young people from infancy throughout adolescence³. Children learn

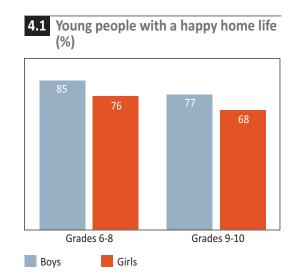


and develop values and norms based on those modeled, taught, and enforced within the family environment, and these norms will affect how they choose to interact and behave. Children exposed to a parenting style that combines warmth, control and affection throughout their childhood are more likely to be self-reliant, responsible, friendly and achieve high academic standing at school, for example⁴.

Parents also impact youth choices; strong parental support buffers the influence peers have on a child's engagement in risky behaviours, such as substance abuse⁵. This is important during adolescence, as adolescence is typically when young people begin to challenge parental control and values and begin to be influenced by peers as they create their own identity⁶. This growth in personal autonomy during the period of

adolescence can result in varying degrees of conflict with parents. Positive relationships with parents prior to and during this transition period are an important source of support throughout adolescence and are highly correlated to lower levels of delinquent behaviour, depression, and psychosomatic symptoms⁷.

In our sample, the majority of young people in Canada reported being in happy homes, with positive relationships and communication with at least one parent. Figure 4.1 shows the number of young people who report having a happy home life.



Relationships with parents have improved relative to historical norms. However, at least a third of young people do report high levels of pressure felt due to expectations that are placed upon them from, even happy, homes (Figure 4.2).

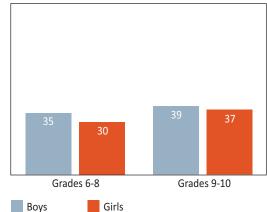
The School Context

As young people get older, school becomes more important, and the support of teachers and peer connections within schools have greater influence on behaviour^{8,9}. Schools provide an important environment for building self-esteem, self-efficacy and a sense of control among students⁹. Young people who feel connected with their school and have positive

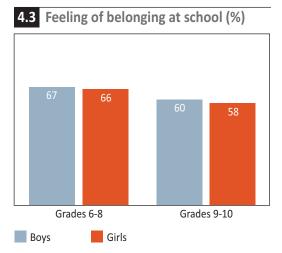
experiences with teachers and peers are more likely to develop strong emotional bonds and self-confidence. This may manifest into a lower likelihood of engaging in healthcompromising activities, as well as improved mental and emotional well-being¹⁰. On the other hand, young people who feel less connected to school are more likely to search and connect with like-minded peers, and these peer groups tend to engage in high-risk activities¹¹. Those young people who do not feel accepted by their peers or connected with their school are the most likely to have lower levels of confidence and sense of self¹².

Among all students surveyed as part of the HBSC study, the majority (64%) reported feeling that they belonged at school. However, there does exist a significant minority of young people who feel alienated from school. **Figure 4.3** provides findings about feeling of belonging at school by sex and grade level.









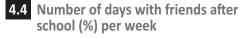
The Peer Context

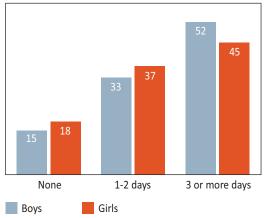
In conjunction with the home and school environment, peers can have significant impact on a young person's health and health behaviours. From childhood to adolescence, peer relationships become increasingly significant sources of support, companionship, information and advice, and can have short- and long-term effects¹³⁻¹⁵. Peers provide young people with developmental opportunities and social possibilities that are not available through relationships with adults¹⁶. Having supportive friends is associated with positive outcomes, such as feeling good about oneself, feeling connected with others, having a positive outlook, and contributing to successes in subsequent romantic relationships¹⁷. If friendships are based on shared interests such as drug use or delinguency, these can result in negative health outcomes.



The Neighbourhood Context

The neighbourhood where young people live can impact their health and health behaviours. Neighbourhood-level factors can be broadly grouped in three categories: physical factors, social factors and economic factors. Physical factors include aspects of the built environment or how the land is used. Social factors relate to the Most young people have at least one close male or female friend and it is common for peers to spend time together after school three or more times per week (Figure 4.4). Overall, 47% of boys and 43% of girls reported spending three or more evenings per week with friends.



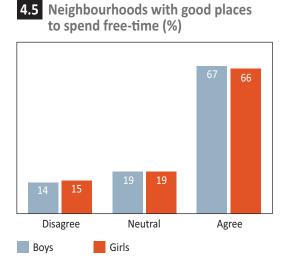


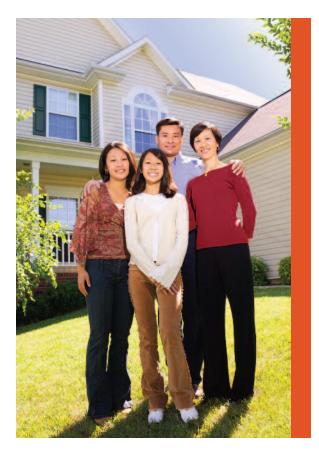
people and relationships that exist in the environment such as the feeling of trust between neighbours. Economic factors are measured by looking at area-level indicators. These include formal education, total household income levels, and housing ownership.

The characteristics of neighbourhoods, whether measured in terms of physical, social or economic attributes, can have important impacts, ranging from diet and physical activity¹⁸ to injury¹⁹ and violence²⁰. Neighbourhoods represent key environmental settings for youth and are places where policies are enacted, physical spaces and structures exist, and cultural, social and interpersonal interactions occur. The availability and quality of affordable housing²¹, the extent of poverty or socio-economic advantage²², safety concerns related to the presence of crime or gangs^{23,24}, or the sense of warmth and cohesion in a well-organized and socially connected neighbourhood²⁵ each can be connected to states of disease or wellness.

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Most Canadian students live in neighbourhoods where they feel children can safely play outside (75%) however, 8% of students do not agree with this statement. About two-thirds of students agree that their neighbourhood has good places to spend free time (Figure 4.5), but again there is a large group of young people for whom this is not the case. Having spaces for safe extra-curricular activities is an important characteristic of a healthy neighbourhood.





Chapters 5-8

The report provides a unique new look at contextual determinants of injury among young Canadians. In chapter 5, focus is on the home and family context looking at features of these environments and their influence on injury. Chapter 6 is a look at the school environment, an important context for possible injury for young people because of the amount of time they spend at school and the activities, especially physical activities, that they participate in there. Chapter 7 examines the peer context and the influence peers have on risk taking and injury experience. The final context chapter (chapter 8) is about the relationship between features of the social and physical environment of neighbourhoods and severe injury experiences in youth.

It is our hope that the four context chapters, when reviewed together, will provide a useful assessment of risk and protective factors for injury, at the context level, for young Canadians. This information is essential to inform intervention targeted not just at individuals, but at the environments where they live, learn, work and play.

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Chapter

43



Shannon Piedt Michael Sedgley Stephanie Burrows Ian Pike

Injury in the Home and Family Context

Introduction

What is the home setting?

In the context of this report, the home setting is characterized as any house or yard in which a student (grades 6-10) sustained his or her most severe injury within the last year. Severe home injuries are defined as injuries that occurred in a home or yard and either required treatment such as the placement of a cast, stitches or an overnight admission to hospital, or caused the young person to miss five or more days of school or usual activities. The survey response options do not differentiate between injuries that occurred in the student's own home or yard from those that were sustained in another home or yard setting. For ethical reasons, HBSC does not currently ask about intentional self-harm, nor abuse or neglect, therefore the data do not separate unintentional from intentional injuries. Injuries caused by self-harm or physical or sexual abuse commonly occur in the home setting¹.

Why does the home setting matter?

The home and yard are important in the day-to-day lives of young people, and consequently, are common setting for injury. Although injuries in the home decrease as students get older (see chapter 2, Table 2.1), the home setting is surpassed only by sports facility or field. Research suggests that children 10-18 years old are more likely than younger children to suffer injuries in the back yard, garden, or driveway rather than inside the home², but the HSBC does not separate home from yard injuries.

A recent systematic review found male sex, relatively increased weight or height, psychological difficulties, behavioural problems, risk-taking behaviour, having many siblings, having older siblings, or having a younger mother was associated with an increased risk of injury in several settings, including the home². Dark and cluttered homes³ and a lack of monitoring and poor supervision by parents or caregivers⁴ also increase the risk of a home injury.

What are we reporting in this chapter?

This chapter describes self-reported injuries and severe injuries in the home and yard among Canadian students in grades 6-10. Factors that may be related to home injuries are broken into three categories: demographic, family, and social characteristics (Table 5.1). Our aim is to better understand the context of home injuries for young Canadians.

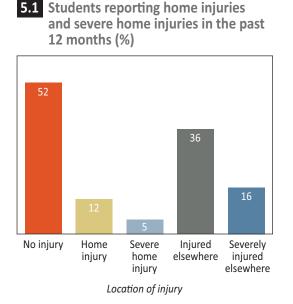


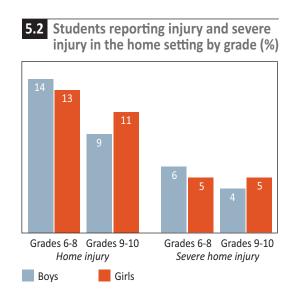
Demographic Characteristics and Home Injuries

Of the 12,056 students in grades 6-10 who reported being injured in the previous 12 months, 2,985 (12% of the total sample) suffered an injury in the home or yard and 5% of the total sample endured a severe home or yard injury (Figure 5.1). The remaining figures and data in this chapter will focus on those students who reported being injured in the home or yard.

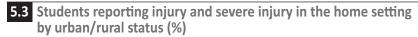
Grade level and sex

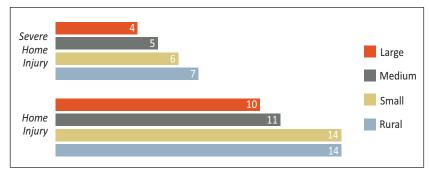
Across all grade levels, the proportion of students injured was similar between boys and girls (Figure 5.2).





Demographic Characteristics		
Sex		
Grade level		
Size of community (urban/rural status)		
Family Characteristics		
Length of time in Canada		
Socioeconomic status		
Going to bed hungry		
Living in a foster home		
Social Characteristics		
Smoking		
Binge-drinking		
Cannabis use		
Illicit drug use		
Prescription drug use		





City or town size

The proportion of students reporting home injuries increased as their community size decreased. As illustrated in Figure 5.3, 14% of students living in rural or small locations, suffered a home injury but only 10% of students living in large urban centers were injured at home.

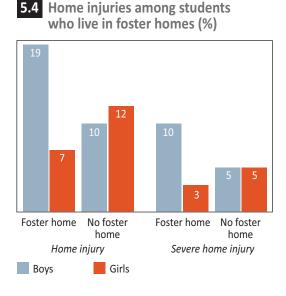
Family Characteristics and Home Injuries

Family characteristics include living arrangements, as well as family wealth (socioeconomic status (SES)) and family functioning (measured by asking the student how often they go to bed hungry). In addition, the length of time the student has lived in Canada and whether or not the student lived in a foster home are included as family characteristics.

Living arrangements

Students were asked who they lived with and if they were living in a foster or group home. Boys living in a foster home reported more home injuries than both boys not living in foster home and girls (regardless of their living situation) (Figure 5.4). When compared with girls not living in a foster home, girls living in a foster home reported fewer home injuries (7% versus 12%).

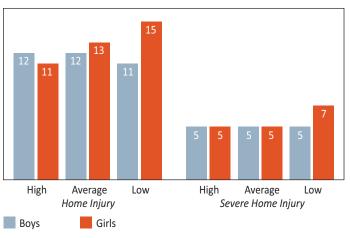




Socioeconomic status

The pattern of home injuries and socioeconomic status (SES) differs for boys and girls (Figure 5.5). Boys reported a similar proportion of home injuries regardless of SES (12% for high SES, 12% for average and 11% for low). However, the proportion of girls reporting home injuries increased from 11% among high SES students to 15% among low socioeconomic girls. A similar pattern was found for severe home injuries and SES: the proportion of injured boys was fairly consistent regardless of SES, while girls of low SES reported the greatest proportion of severe home injuries.

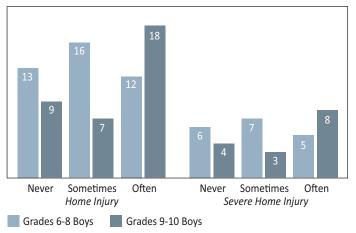




Family functioning (going to school or bed hungry)

To measure family functioning, students were asked how often they went to school or bed hungry because there is not enough food at home. This is a standard measure of family functioning. The association between home injuries and going to school or bed hungry among boys differed by grade level. Boys in grades 6-8 who sometimes went to school or bed hungry reported the highest proportion of injuries (16%), whereas the older boys had the highest proportion of injuries (18%). Interestingly, only 7% of the older boys who sometimes went to school or bed hungry suffered an injury in the home. A similar pattern was observed among boys who reported a severe home injury (Figure 5.6).

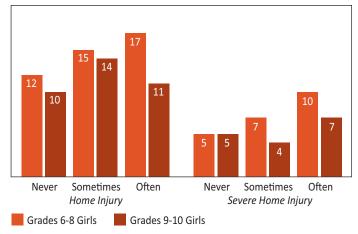
5.6 Male students reporting injury and severe injury at home by frequency of going to school or bed hungry (%)





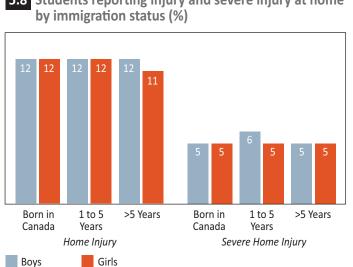
The proportion of home injuries reported among grade 6-8 girls increased as the frequency of going to school or bed hungry increased (12% to 17%) and the same pattern was observed for severe home injuries (5% to 10%) (Figure 5.7). Among girls in grades 9-10, 14% of girls who sometimes went to school or bed hungry reported a home injury, whereas the proportion of injuries was similar among those who did not. Often going to school or bed hungry was associated with more severe home injuries for grade 9-10 girls. There was minimal difference in severe home injuries between those who never or sometimes went to bed hungry.



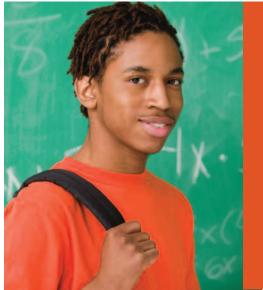


Length of time in Canada

Regardless of the amount of time spent in Canada, approximately 12% of students reported being injured in the home (Figure 5.8). Immigration status was not related to rate of home injury or severe home injury.



5.8 Students reporting injury and severe injury at home

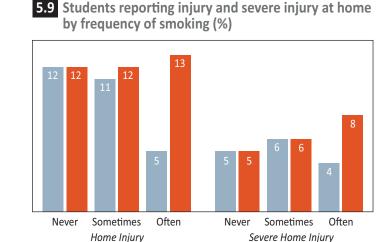


Social Characteristics

In this chapter, social characteristics refer to how students spend their time outside of school hours. Sustaining an injury at home was examined by the following activities: student volunteering, belonging to sports groups, youth clubs, religious groups, cultural associations, and political organizations, or by weekend screen time. No relationship between home injury and student activities was found. Smoking, drinking and drug use are also considered social characteristics and are reported in this chapter in relation to home injury.

Cigarette smoking

Students were asked how often they smoked cigarettes. Girls reported a small but consistent increase in home injuries and severe home injuries as the frequency of cigarette smoking increased (Figure 5.9). For boys, the opposite pattern is observed where 12% of boys who never smoked reported a home injury while only 5% of boys who often smoked reported a home injury.



Alcohol consumption

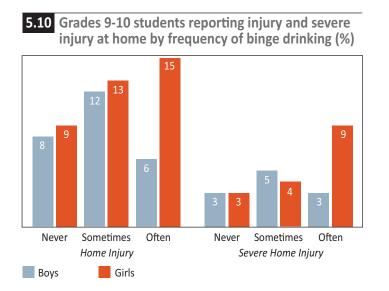
Grades 9-10 students were asked about their alcohol consumption and binge drinking was defined as having five or

more drinks on one occasion for boys, and four or more drinks on one occasion for girls. The proportion of girls who reported a home injury steadily increased from 9% to 15% as the frequency of binge drinking increased (Figure 5.10). This pattern was also true for severe home injuries. Boys who reported sometimes binge drinking had the highest proportion of home injuries (12%) and severe home injuries (5%). With the

Girls

Boys

exception of one category, girls consistently reported more home injuries than boys across all levels of alcohol consumption.

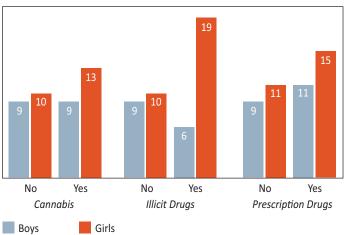


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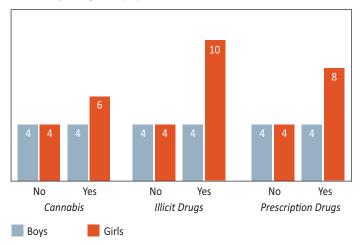
Drug use

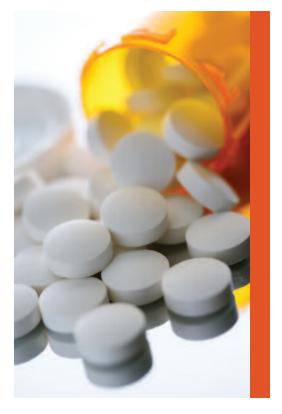
Regardless of the drug, grade 9-10 girls reported a higher proportion of home injuries than grade 9-10 boys (Figure 5.11). Among girls, home injuries were most common for those who used illicit drugs (19%), followed by nonprescribed prescription drugs (15%), and cannabis (13%). Among girls, those who reported use of each of the three drug types had higher rates of home injury and severe home injury. No such relationships existed for boys (figures 5.11 and 5.12) (Figure 5.12).





5.12 Grades 9-10 students reporting severe home injury by drug use (%)





Statistical Modelling of Protective Factors for Injury

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As described in chapter 3, mathematical models were created to identify factors that potentially protect young students from home injury. The models quantify the strengths of relationships, while also controlling for other factors that could affect injury occurrence. A number of factors were found to reduce the risk of home injury (Table 5.2). For example, for boys grades 6-8, living in a large urban centre afforded them a home injury risk reduction of about a third, as compared to students in rural areas. Table 5.2 highlights other risk reductions, comparing factors such as living in urban areas or smoking cigarettes, with their opposites (i.e., living in rural areas, or not smoking cigarettes).



Table 5.2: Factors that <i>reduce</i> the risk of any home injury and severe home injury after adjusting for other factors				
Preventive Factors	Home Injury Risk Reduction	Severe Home Injury Risk Reduction		
oys Grades 6-8				
Living in a large centre ¹	33%	47%		
iirls Grades 6-8				
Living in a large centre	43%	*		
Not smoking cigarettes	22%	37%		
Never going to bed hungry	*	55%		
oys Grades 9-10				
Living in a large centre	56%	63%		
Not in foster care	74%	90%		
Never going to bed hungry	54%	*		
Never binge drinking	51%	37%		
iirls Grades 9-10				
Living in a large centre ¹	42%	*		
High SES	33%	57%		
Never going to bed hungry	27%	*		
Never binge drinking	38%	48%		
Never using illicit drugs	37%	57%		

* Results were not statistically signficant.

¹ Living in a large centre was compared with living in a small centre.

Summary and Implications

This chapter shows that approximately 12% of all youth injuries occur within the home and yard setting and not all youth are at equal risk of sustaining a home-based injury.

Demographic characteristics

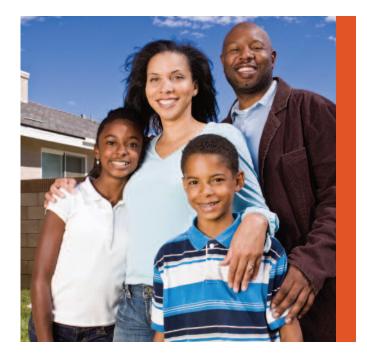
Although previous studies⁵ have consistently reported that boys are more likely to be injured than girls, this was not observed for home injuries. This may be explained by girls spending more time at home than boys, or could be attributed to the types of activities that girls in grades 9-10 perform at home.

For rural students who lived on farms, participating in animal care, riding on vehicles, fieldwork, horseplay, sports and recreational activities at home all contribute to an increased risk of injury⁶. All terrain vehicle (ATV) injuries in the yard may also contribute to the higher burden of injury in smaller communities⁷. Previous evidence shows that children and youth sustain a large number of ATV-related injuries⁸.

Family characteristics

Programs and services that help families function well enough to meet the needs of school-aged children should be supported. Rather than just a socioeconomic indicator, food security is an indicator of a family's ability to organize, obtain and prepare healthy and filling food options. Results indicated that 25% of the students went to school or bed hungry at least some of the time. Going to school or bed hungry was associated with home injury. Among boys in grades 9-10, for example, those who reported experiencing this situation frequently were four times more likely to also report home injury.

With regard to living arrangements, boys in grades 9-10 in foster homes were more likely to experience a home injury or a severe home injury than those who did not



live in foster homes. A study from the United States found that foster homes had nearly twice the risk of physical abuse reports to social services than homes in the community⁹.

Social characteristics

Smoking, drinking alcohol and drug use are a part of many students' lives. Surprisingly, students who are in the more extreme categories – those who smoked daily, indulged in binge-drinking often and/or used illicit drugs at least once – sustained fewer home injuries than other students. It is possible that these students spent less time at home than students who did not engage in those activities and therefore the injuries they sustained occurred elsewhere.

Key issues of concern

- 1. Students living in small and rural communities had a higher proportion of home injuries than those in larger sized communities.
- 2. Girls from lower SES families had more injuries in the home than those from average or high SES families.
- 3. Students who engaged in some binge drinking or used illicit drugs generally reported higher proportions of home injuries although the association between excessive drinking and drug use and home injuries is less clear.
- 4. Students in foster care, in particular boys in grades 9-10, reported more home injuries.

Key issues to celebrate

1. No relationship was found between home injury and the length of time a student lived in Canada or a wide variety of social activities: weekend screen time, or student volunteering, belonging to sports groups, youth clubs, religious groups, cultural associations, and political organizations.

Closing Thoughts

It would be useful to examine the risk of injury for those that occurred within the home versus within the yard, as well as whether injuries occurred in a student's own home or the home of another person (this was not clarified in the HBSC survey). It would also be interesting to know whether injuries occurred while there was an adult in the house. Further, a greater understanding of the context of injury is required to better target injury prevention efforts.

Efforts should be made to reduce the number of high-risk behaviours among youth. Previous studies examining health behaviour of school-aged children show that Canadian youth who engage in multiple high-risk behaviours, such as smoking and drinking, have higher injury rates than those who engage in less high-risk behaviours¹⁰.

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Chapter

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Injury and the School Environment

A Description of the Injury Problem

Unintentional injury in school-aged children accounts for the largest proportion of reports to paediatric emergency departments in Canada¹. In Alberta, for example, for every injury-related death under age 20, there are an estimated 44 hospitalizations and 979 hospital-visits annually². Children and adolescents spend an estimated 25% of their waking hours in school or on school property, so injury risk awareness specific to the school environment is critical to understanding the public health burden of injury in children and adolescents. Targeting the school environment as a locale for injury prevention initiatives and promoting safe physical activity can therefore play a significant role in fostering healthy outcomes for our children.

What is the School Context?

In this chapter we examine school-based injuries. This means that we are interested in injuries that occur either inside a young person's school, such as in the classrooms, hallways or gymnasium, as well as injuries that occur on the school grounds. As many schools are used for after-school, evening and weekend activities, we include school-based injuries that occur at school during, and outside of, regular school hours.



What are We Reporting in This Chapter?

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In this chapter, we describe school-based injuries and the risk factors that are associated with incurring an injury at school or on school grounds. We examine proportions of "any school injury", and "severe school injury" in sub-groups of students by demographic factors (e.g., sex, grade level, urban/rural status), physical factors (e.g., in-class physical activity, free time physical activity at school), social factors (e.g., sense of belonging at school, being treated with



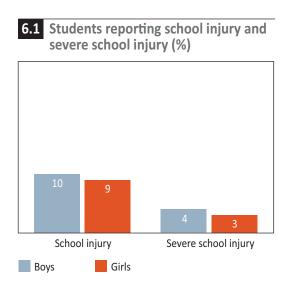
respect at school, bullying), and behavioural or personal factors (e.g., academic performance, perception of school). The school injury definition captures any injury that occurred at school in the past 12 months, as reported by the student. "Severe school injury" indicates that the student reported a school injury requiring significant medical treatment (such as the placement of a cast, stitches, surgery, or an overnight stay in hospital), or requiring 5 or more days off from school or usual activities.

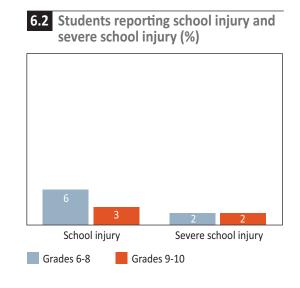
A Demographic Profile of School-Based Injury

Overall, 9% of the surveyed students reported an injury at school, or on school grounds in the past 12 months. Four percent of students reported that injury to be severe. A large proportion of these are sports injuries.

Sex and Grade

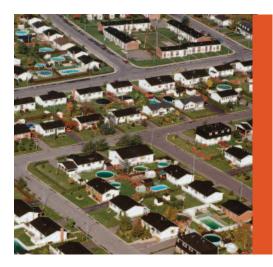
As shown in **Figure 6.1**, a similar proportion of boys (10%) and girls (9%) reported a school-based injury. This same pattern is seen with severe school injuries, as 4% of boys and 3% of girls reported a severe school injury. Younger students reported a greater proportion of school injuries than older students (**Figure 6.2**).





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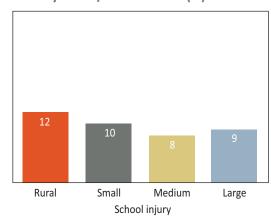
Students from rural communities reported a higher rate of school injuries than students from urban areas, but there was very little difference in reported injuries between small, medium and large urban centres (Figure 6.3). There were no differences in the proportions of boys and girls reporting severe school injuries, regardless of home community or grade level.



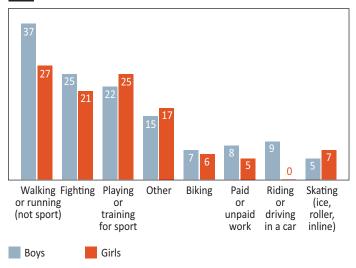
Mechanism of School Injury

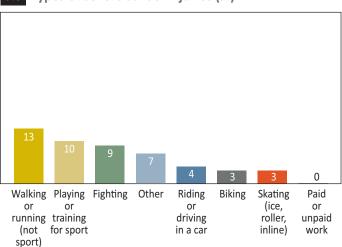
To better understand why specific groups of students are at higher risk of school injury, we must consider what these students were doing when the injury occurred. Figure 6.4 shows that the greatest proportion of school injuries occur while walking or running, then fighting, followed closely by playing or training for sport. Fighting injuries are also prevalent in both boys and girls. Mechanisms of injury differed slightly by sex, for example, girls were more likely to be injured when playing, training for sport, or skating than boys. When examining the mechanisms of severe school injuries, it is obvious that physical activity is a very important one (Figure 6.5). Taken together, physical activities such as walking or running, playing a sport, cycling, and skating, are mechanisms for one third of all severe school injuries.





6.4 Types of school injury (%)





6.5 Types of severe school injuries (%)

Physical Factors Associated with School Injury

In-class physical activity

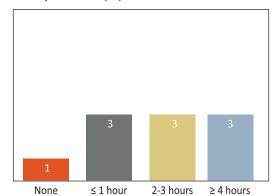
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For those engaging in less than one hour of in-class physical activity, there is a slight increase in reported injury over those who report no physical activity at school. This increase in reported injury is consistent in those that participate in little, more more than 4 hours of physical activity in class per week (Figure 6.6).

Physical activity in class time was more associated with injury risk in boys, compared to girls.





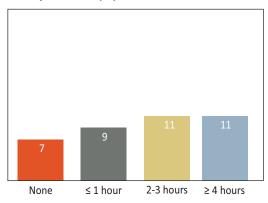




Free time physical activity

Figure 6.7 illustrates the proportion of students reporting an injury at school by their reported free time physical activity during recess, lunch break, and on school property after school. There were increasing reports of injury with greater reported free time physical activity. Over 10% of students that reported engaging in 4 hours or more of free time physical activity per week reported an injury. When these patterns were examined for severe injury, there was also an increase in reported severe injury with increasing hours of free time physical activity across all age and sex groups.





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Social Factors Associated with School Injury

School social factors play important roles in young people's quality of life. Their overall feelings of inclusion and satisfaction with school life are important aspects of their wellbeing. A young person's perceptions in this respect are strongly influenced by experiences and relationships formed at school with peers and teachers.

Sense of belonging at school

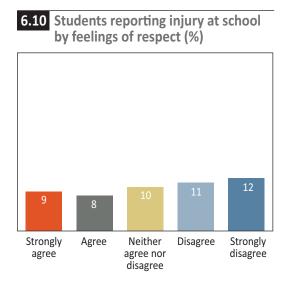
Students were asked to respond to a set of questions about social factors in the school environment that may affect their injury risk. One such question asked whether students felt they belonged at school and responses ranged from strongly agree to strongly disagree.

It appears that there was a relationship between feelings of not belonging at school and injury (Figure 6.8). The greatest proportion of injuries were among students who did not feel a sense of belonging at their school. There was no trend in severe school injury.

The trend was the same for boys and girls. It appears, however, that the relationship between decreasing sense of belonging at school and injury does not hold for older students (Figure 6.9).

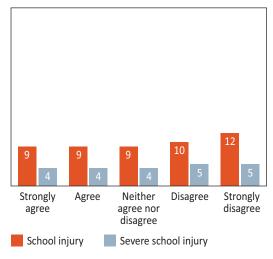
Treated with respect at school

Students were also asked to report their feelings of being treated with respect at school. Although the difference was not great, those who did not feel respected at school reported more injury at school (Figure 6.10). When considering any school injury, approximately 10% of students who felt that the school environment was disrespectful reported a severe school injury, compared with 8% among students who felt respected.

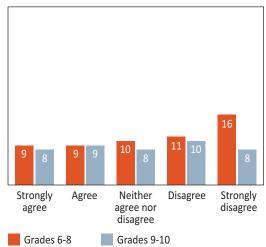




6.8 Students reporting school injury and severe school injury by sense of belonging at school (%)







Boys who did not feel respected reported more injury (14%) than girls (8%) in the same category. Younger students reported more injuries, regardless of response category. Among those students who felt respected, 10% of younger students and 7% of older students reported injuries. Among those who did not feel respected, 13% of younger students, and 10% of older students reported injuries.

School injury and bullying

Bullying is a significant problem at school and on school grounds. Of students that reported being bullied at least two or three times per month, 14% reported a school-based injury. Moreover, 9% of students that were bullied at least two to three times per month reported an injury serious enough to warrant significant medical treatment or days off from school or usual activities.

Reported frequencies of bullying did not differ greatly between boys and girls. Figure 6.11 illustrates bullying by grade where students who reported frequent bullying, also reported more injuries at school.

Behavioural or Personal Factors Associated with School Injury

School injury and academic performance

The greatest proportion of school injury was reported by students who held a below average perception of their academic performance (Figure 6.12). The same pattern was not observed for severe school injuries.

When looking at academic performance by age and sex, it appears that younger girls and older boys that report below average academic performance, may be at greater risk for injury.

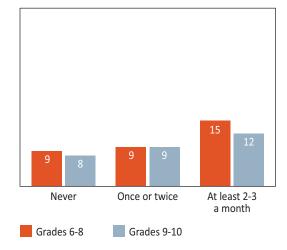
High academic performance was associated with a reduction in school injuries and severe school injuries for girls in grades 6-8 and a reduction in school injuries in boys, grades 9-10. Girls in grades 6-8 who reported better academic performance were less likely to be injured or severely injured at school, compared with girls who reported below average academic performance.

School injury and perception of school

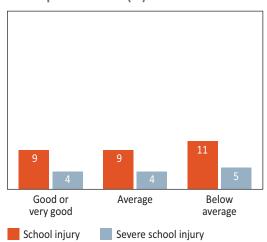
In contrast to the increase in injury by students reporting no sense of belonging at school, there were no differences in injury for students who reported liking school compared to those that reported not liking school. This was true for boys and girls and for older and younger students.







6.12 Students reporting injury and severe injury at school by academic performance (%)



Statistical Modelling of Protective Factors for Injury

In addition to descriptive statistics that have allowed us to report the frequency of injury among different sub-groups of young people, we also undertook a statistical modelling process that tests for associations between injuries and specific exposures, while at the same time taking into account other factors that might interfere in the injury relationship. For example, we examined the relationship between being bullied and injury while adjusting for the higher reports of injuries in boys and in students who are highly physically active. A number of factors may be associated with the reduced risk of school injury and severe school injury (Table 6.1). For preventive factors that have more than two response options, the most contrasting options



are compared (e.g., never bullied versus frequently bullied).

Protective Factors	School Injury Risk Reduction	Severe School Injury Risk Reduction
bys Grades 6-8		
Not being bullied	62%	56%
Not in physical activity (in class)	35%	*
Not in physical activity (in free-time)	55%	52%
irls Grades 6-8		
Not being bullied	56%	36%
Not in physical activity (in free-time)	54%	46%
High socioeconomic status	31%	45%
High academic performance	54%	67%
bys Grades 9-10		
Not being bullied	51%	58%
Not involved in physical activity (in class)	32%	*
Not involved in physical activity (in free time)	58%	87%
High academic performance	52%	*
irls Grades 9-10		
Not being bullied	58%	67%
Not involved in physical activity (in free time)	65%	69%
High socioeconomic status	36%	*

* Results were not statsitically signficant.

Summary and Implications

This chapter has brought to light a number of important findings about school-based injury that can be used to inform further research and intervention. Bullying, physical activity, socioeconomic status (SES) among girls, and academic performance are factors that warrant further attention.

Bullying

Bullying was a strong predictor of any school injury across all sex and age groups. Those who reported being bullied "sometimes" or "often" were up to



2 times more likely to be injured compared with those who did not report being bullied. This association was especially strong for younger boys and older girls. Severe school injuries also tended to be associated with bullying. This was true for both younger and older, boys and girls. Bullying had the greatest impact on older girls, where those who reported being bullied "often", had 3 times the risk of severe injury compared to those who did not report any bullying. For the other groups, bullying was equally problematic as all groups reporting bullying were at an increased risk for severe injury. A related factor, not feeling respected at school may be associated with increased risk in injury and severe injury for older boys, but not for other groups.

Physical activity

Physical activity was a second factor that may be associated with school injury and severe school injury. Taken together, physical activities such as training for a sport, bicycling, skating, walking and running are mechanisms for one third of all serious school injuries. After adjusting for a number of factors that might be interfering with injury relationships, students that report more time spent doing physical activity during free time at school, had a higher risk of reporting a school-based injury. Those who participated in at least some physical activity during free- time had an increased risk of injury at school, compared to those who did not participate



in free-time physical activity. For older girls and boys, the risk of injury was highest for those who did at least four hours of physical activity during free-time.

Although physical activity in free-time at school increased the risk of injury for both boys and girls, there may be differences in the types and severity of injuries by sex. The types and intensity of activities taken, or physical development may place one at greater risk over the other. For example, girls may be at higher risk for knee injury over boys.

Socioeconomic status

SES was only associated with injuries for girls. Girls of lower SES in all grades had up to 60% higher risk of any school injury compared with girls of higher SES. Interestingly, this association remained when time spent doing physical activity at school both during and outside of class time were considered.

Academic performance

Self-reported academic performance was associated with any school injuries, but the relationship was different between age and sex groups. High academic performance was associated with a reduction in school injuries and severe school injuries for girls in grades 6-8, and a reduction in school injuries in boys, grades 9-10. These associations remained even when time spent doing physical activity both in and outside of class time were considered. At present, we cannot determine specifically why these different patterns for the grade and sex groups exist. Further investigation into the relationship between injury and academic performance in different groups of students would be useful.

Key issues of concern

- 1. Nearly 10% of students in the survey suffered an injury at school. This represents a significant number of youth, highlighting that the school setting is important to consider when trying to prevent injuries among youth.
- 2. Bullying was the most important predictor of school-based injuries. Boys and girls who were bullied reported higher proportions of injuries, and had a greater risk of injury in all grades.
- 3. A large number of injuries occurred during free time physical activity at school (e.g., recess). This evidence emphasizes that injury prevention initiatives should be extended beyond the sports setting, and should include a focus on injuries that occur during free-play.

Key issues to celebrate

- 1. Many of the characteristics of the school setting that led to higher proportions of injuries or higher injury risk were similar for the various age and sex groups included in the study and this may support school-wide approaches to intervention prevention.
- 2. Our findings indicate several risk factors for school-based injuries (e.g., bullying, free time physical activity, academic performance) that provide potential clues for prevention.

Closing Thoughts

Because children spend much of their time at school, examining the relationship between characteristics of the school setting and injury risk is extremely important. The school setting is an ideal place to initiate injury prevention efforts, since children in school are a captive audience, and many of the activities that can lead to injuries (e.g., recess, school sports) originate in this setting.

The HBSC study revealed that injuries in the school setting are related to several different aspects, including physical (e.g., free play), social (e.g., bullying), and behavioural/personal (e.g., school performance) factors. Each of these areas includes modifiable elements, which could be targeted in hopes of reducing the number of school-based injuries. For example, by redesigning school playing fields, it may be possible to reduce the number of injuries that occur to children who engage in free time physical activity. Addressing other factors,

such as bullying, may require more complex approaches. Yet, having identified some of the sources that contribute to school-based injuries, researchers, school board or government officials, school administrators, teachers, parents, and youth, can begin working towards reducing the impact and burden of these injuries.

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Chapter



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Severe Injury and the Neighbourhood Context

Introduction

The neighbourhood context defined

A neighbourhood is a geographically localised community within a larger city, town, or region. Neighbourhoods include physical infrastructure such as housing, commercial buildings, schools, parks, roads, and sidewalks¹. It is important to note, however, that neighbourhoods are not simply areas that can be physically or geographically defined. They are also social communities in which individuals interact. Demographic (e.g., racial composition, religious affiliations, family type) and socioeconomic



(e.g., income and education levels) characteristics of the residents, social relationships between residents, and feelings of safety within the neighbourhood are also important components¹. Neighbourhood features can play an important role in youth injury. For the purpose of this chapter, a neighbourhood is defined as "the local setting where individual students live and go to school²". Data from the HBSC student and administrator questionnaires were linked with geographic information systems (GIS) data to examine the potential effects of physical, social, and socioeconomic characteristics of neighbourhoods on youth injury.

Why does the neighbourhood context matter?

As children grow, they spend more of their time outside of the home and their neighbourhoods become increasingly important. The physical space and structures available to youth in a neighbourhood, as well as the social and interpersonal interactions that occur in these environments, can have an impact on their behaviour, and subsequently, their injury risk². Identifying specific features of a neighbourhood that are associated with the risk of injury among youth can inform public health officials and policy makers who influence the physical and social environments that people live in.

Several characteristics of neighbourhoods have important influences on the health of the population. The availability and accessibility of affordable, safe housing and recreational facilities, services such as fire and police protection, adequate health care, safe roads, residential stability, crime rates and social norms are

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among the factors shown to have important influences on several health outcomes, including injury³. Neighbourhood characteristics can be broadly grouped into three areas that influence youth behaviour and their risk of injury: physical, social and socioeconomic.

Physical characteristics include the built environment and community infrastructure. This encompasses all buildings, spaces and amenities that are created or modified by people, including homes, workplaces, recreation areas and transportation systems. The provision of accessible and safe physical spaces can positively influence youth's behaviour and reduce their risk of injury.

Social characteristics of a neighbourhood refer to the level of trust, cohesiveness, social support, and safety. This has been called "social capital", a measure of cooperation within and among groups through shared norms, values and understandings⁴.

Socioeconomic status (SES) of a neighbourhood typically refers to average household income, parental level of education and parental employment status.



Although the physical, social and socioeconomic characteristics of neighbourhoods have been presented independently, there may be associations between them. For example, high injury levels in low SES neighbourhoods may be due to physical characteristics of these neighbourhoods, such as poor quality sidewalks, lack of bicycle paths, and absence of safe play areas⁵, but also may be associated with social problems, such as crime and public alcohol or drug use^{6,7}.

What are We Reporting in This Chapter?

In this chapter, we examine the link between physical, social and socioeconomic aspects of the neighbourhood context and severe injury in youth. We focus on severe injuries because of their stronger relationship with neighbourhood characteristics and, given the large negative impacts they have on the lives of youth and their families, these are the injuries we would most like to prevent.

In addition to the self-reported information from the administrator and student HBSC questionnaires, information about the school neighbourhoods came from a geographic information system. School addresses for each of the participating HBSC schools were "geo-coded" and measures were taken of the physical and socioeconomic environment within a one kilometre circular area or buffer around each school. Neighbourhood measures taken within these buffers were either extracted from electronic records from the 2006 Canada Census of Population⁸, or from ArcGIS version 9.3 GIS software and the CanMap GIS database (DMTI Spatial Inc., Markham, ON². Objective data regarding the presence of parks and the type of land use within a one kilometre buffer around participating schools were obtained from GIS data. Table 7.1 lists the neighbourhood characteristics that we examined.

Table 7.1: Neighbourhood factors that may
be related to injury

Phys	Physical characteristics		
	Presence of garbage		
	Presence of heavy traffic		
	Presence of vacant or shabby houses or buildings		
	Access to parks		
	Land use		
ocia	al characteristics		
	Presence of gangs		
	Presence of crime		
	Good places to spend free time		
	Safe for young children to play outside during the day		
	People would try to take advantage of them		
	Trusting others		
ocioeconomic characteristics			
	Average household income		
	Single-parent households		
	Adult education		

Physical Characteristics of School Neighbourhoods

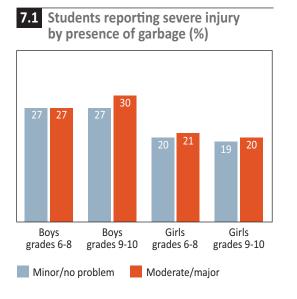
Physical characteristics of a neighbourhood can influence youth's injury risk by increasing or decreasing their exposure to potentially harmful environments. Features of the transportation system such as traffic calming measures, the presence of pedestrian safety structures (e.g., pedestrian crossings or signals, lighting), or well-maintained walking and biking lanes to separate different road users, can reduce injury risk^{5,9,10}. On the other hand, physical neighbourhood disorder refers to visual signs of landscape deterioration, such as graffiti, vacant or abandoned buildings, broken windows, and presence of litter^{11,12}. A higher level of physical disorder in a neighbourhood can increase the risk of partaking in, or being a victim of criminal activity or violence⁷. Paradoxically, it could also be associated with reduced injury risk if youth feel unsafe and avoid going outdoors to walk or play^{11,12}. For the purposes of this chapter, neighbourhood physical characteristics were measured using subjective items from the administrator HBSC questionnaire and included the presence of garbage, heavy traffic, and vacant or shabby buildings in the area surrounding the school. Access to parks and land use were also examined.

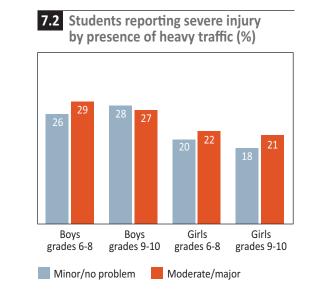
Prescence of garbage

The percentage of students who sustained a severe injury in the previous year was similar whether the school administrator perceived garbage to be a problem in the school neighbourhood or not (Figure 7.1). While there was a higher proportion of severe injuries among boys than girls, severe injuries did not appear to vary by grade level.

Presence of heavy traffic

There was little difference in the proportion of students reporting a severe injury in school neighbourhoods where the school administrator perceived heavy traffic as a moderate or major problem compared with neighbourhoods with a minor or no problem with heavy traffic flow (Figure 7.2). With the exception of grade 9-10 boys, the proportion of severe injuries was slightly higher (2-3% higher) in neighbourhoods where heavy traffic was perceived as a moderate to major problem.



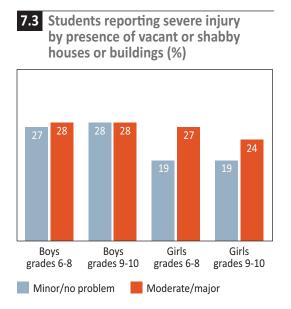


Presence of vacant or shabby houses or buildings

School administrators were asked about the presence of vacant or shabby houses or buildings in their school neighbourhood. For boys, there was little difference in the proportion of severe injuries in school neighbourhoods where vacant or shabby buildings were reported as a moderate or major problem compared with school neighbourhoods where they were reported as a minor or non-existent problem (Figure 7.3). However, for girls, the proportion of severe injuries was greater in school neighbourhoods with a moderate to major problem of vacant or shabby buildings. The difference was greatest for grade 6-8 girls (27% versus 19%).

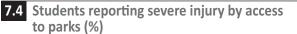
Access to parks

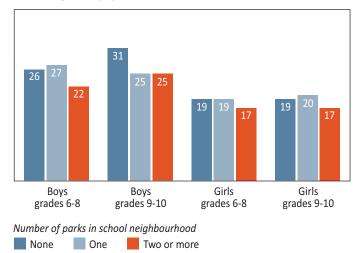
Regardless of grade level, boys attending schools in neighbourhoods with two or more parks consistently reported fewer injuries than students attending schools surrounded by fewer parks (Figure 7.4). However, there was less variation in the proportion of girls reporting a severe injury according to the number of parks in the school neighbourhood than boys.

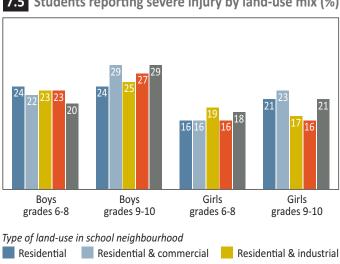


Land use

There were no clear patterns of severe injuries among students in relation to the type of land use in the school neighbourhood (Figure 7.5). However, for older girls, there were fewer severe injuries in neighbourhoods that included industrial land use.







Non-residential

Residential & industrial & commercial

7.5 Students reporting severe injury by land-use mix (%)

Social Characteristics of School Neighbourhoods

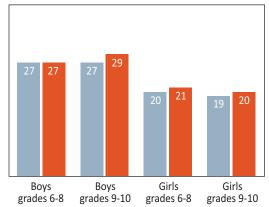
Social characteristics of a neighbourhood, or social capital, goes beyond the notion of safety, and also reflects the quality of social ties between neighbours, their sense of belonging, and their feeling of empowerment. Higher social capital typically engenders greater civic engagement and responsibility for the well-being of others^{4,13}; therefore, one may be more willing to adopt safe behaviour and work towards building a safe environment for oneself and others. In contrast, social disorder refers to threatening behaviour of others , such as gang activity, verbal harassment on the streets, public drinking, or drug sale and/or use^{11,12}. To capture social characteristics, school administrators were asked whether public drinking and drug use, gangs, and crime were perceived to be a problem in the school neighbourhood. Students were asked if they thought that their neighbourhood contained good places to spend time, safe places for children to play, people who could be trusted, and people who would take advantage of them if they could.

Presence of public drinking or drug use

School administrators were asked about people selling drugs or excessive drinking in public around schools. The percentage of severe injuries was similar, regardless of whether the school was in a neighbourhood where others sold drugs or drank in public or not (Figure 7.6).



7.6 Students reporting severe injury by presence of public drinking or drug use (%)

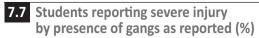


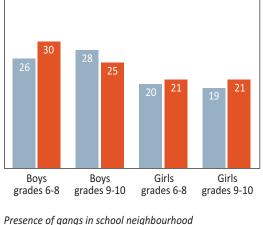
People selling or using drugs or exessive drinking in public in school neighbourhood

Minor/no problem 🛛 📕 Moderate/major

Presence of gangs

There were only minor differences in the proportion of students reporting a severe injury in school neighbourhoods where gangs represented a moderate to major problem as compared with school neighbourhoods with no or minor gang problems (Figure 7.7). There were some differences between boys and girls and between younger boys and older boys in these different neighbourhoods.

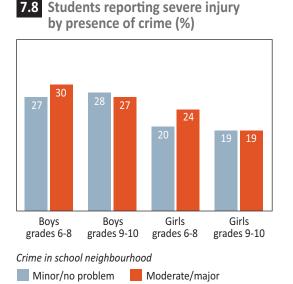




Minor/no problem Moderate/major

Presence of crime

School administrators were asked about crime in their school's neighbourhood. While almost no difference was observed in the proportion of severely injured students in grades 9-10 based on school neighbourhood crime level, the percentages of severely injured boys and girls in grades 6-8 were 3-4% higher in school neighbourhoods in which crime was reported as a moderate to major problem than school neighbourhoods where it was a minor or no problem (Figure 7.8).



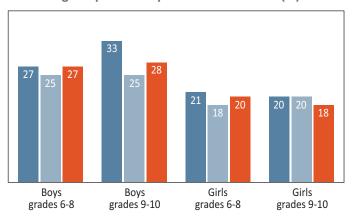
Good places to spend free time

The proportion of severe injury was almost the same whether or not students felt that there were good places to spend their time in their home neighbourhood (Figure 7.9). However, boys in grades 9-10 were the exception. Almost 5% more grade 9-10 boys who disagreed or strongly disagreed that there were good places to spend free time in their home neighbourhoods reported having sustained a severe injury compared with those who agreed that good places existed.

Safe for young children to play outside during the day

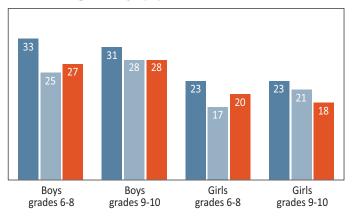
Students who felt that it was not safe for young children to play outside in their home neighbourhood during the day consistently had a higher proportion of severe injuries compared with students in neighbourhoods they felt were safe, or those who did not have an opinion on the issue (Figure 7.10).

7.9 Students reporting severe injury by whether there are good places to spend their free time (%)



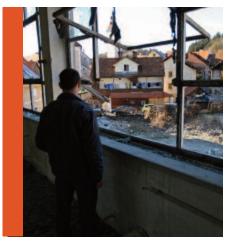
Presence of "good places to spend free time in home neighbourhood" Strongly disagree/disagree Neither agree/disagree Strongly agree/agree

7.10 Students reporting severe injury by reporting that "It is safe for younger children to play outside during the day" (%)



"It is safe for younger children to play outside during the day" Strongly disagree/disagree Neither agree/disagree

Strongly agree/agree



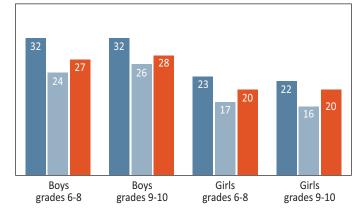
Trusting others

For all students surveyed, severe injuries were more frequent among students who did not feel they could trust people in their home neighbourhood than for those who felt they could trust people or had no opinion (Figure 7.11). Overall, approximately 32% of boys and 23% of girls who reported not trusting people in their neighbourhood also reported a severe injury. Students who stated that they neither agreed nor disagreed with the statement consistently reported the fewest injuries.

People would try to take advantage of them

The proportion of severely injured students was consistently higher among both boys and girls in all grades when they believed that there were people who would take advantage of them (Figure 7.12). Approximately 33% of boys and 26% of girls who believed others would take advantage of them reported a severe injury. The percentage of severely injured students was between 6-9% higher for those who agreed or strongly agreed that most people around their home neighbourhood would try to take advantage of them when compared with those who disagreed or strongly disagreed. Within each grade level and sex category, the proportion of severe injuries was similar among students who neither agreed nor disagreed and those who disagreed or strongly disagreed that others would take advantage of them.

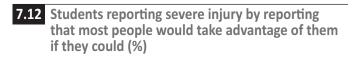
7.11 Students reporting severe injury by reporting that they can trust people around their home neighbourhood (%)

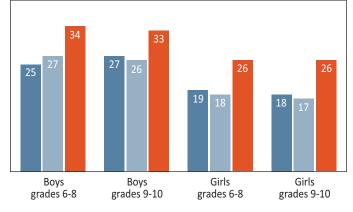


"You can trust people around here"

Strongly disagree/disagree Neither agree/disagree

Strongly agree/agree





"Most people around here would try to take advantage of you if they got the chance" Strongly disagree/disagree Neither agree/disagree

Strongly disagree/disagree Neither age Strongly agree/agree

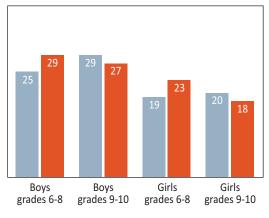
Socioeconomic Characteristics of School Neighbourhoods

Lower SES neighbourhoods often have higher rates of injuries and more severe injuries than more affluent neighbourhoods^{5,14}. Affluent neighbourhoods typically have lower crime rates, restricted access to traffic and "undesirable" neighbours, and their residents are less likely to tolerate deviant behaviour, each of which may protect against injury³. Neighbourhood SES was assessed by the average income of the households, the proportion of adults with at least a high school education, and the proportion of single parent households within a one kilometre buffer around participating schools.

Average household income

Across both sexes and grades, average household income and percentage of severely injured students appear to be inversely related (Figure 7.13). That is, lower income neighbourhoods tended to have a greater percentage of injuries. There was one notable exception: boys in grades 9-10 who were living in the most affluent neighbourhoods had the greatest proportion of severe injuries (38%). There was less variation in severe injuries and average household income among girls.

7.14 Students reporting severe injury by the proportion of single-parent households in the school neighbourhood (%)

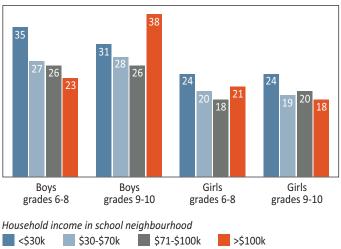


Percentage of single-parent households in school neighbourhood \$20%\$\$>20%

Adult education level

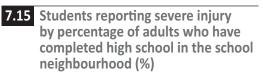
Students attending schools in neighbourhoods where less than 50% of adults had a high school education reported a greater number of severe injuries than students who attended schools in neighbourhoods where at least half of the adults had finished high school (Figure 7.15). Greater differences were observed among boys. Almost 10% more boys in grades 6-8 and 15% more boys in grades 9-10 sustained a severe injury when compared with their peers from neighbourhoods with a greater proportion of highschool or higher educated adults. A similar pattern was observed for girls in grades 6-8, but the situation was reversed for girls in grades 9-10.

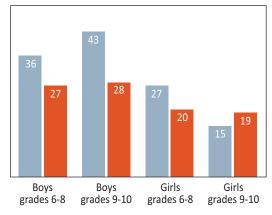




Single-parent households

When comparing the percentages of severely injured students by family structure, we found that younger students sustained a higher proportion of severe injuries when they went to school in neighbourhoods with more single-parent families (Figure 7.14).





Percentage of adults who have have completed at least a high school education in the school neighbourhood \$\$50%\$\$>50%\$\$

Statistical Modelling of Protective Neighbourhood Factors for Severe Injury

As described in chapter 3, mathematical models were created to identify neighbourhood factors that potentially protect young students from severe injury. The models quantify the strengths of relationships,

while also controlling for other factors that could predict injury occurrence. A number of factors were found to reduce the risk of injury (Table 7.2). When a factor has only two response options, the preventive factor on the left (e.g., minor or no problem with gang activity) is compared with its opposite (e.g., moderate or major problem with gang activity). For preventive factors that have more than two response options, the most contrasting options are compared (e.g., access to at least two parks versus no parks). Any exceptions are indicated by footnotes underneath Table 7.2.

Table 7.2: Neighbourhood factors that reduce the risk of severe iniury after adjusting for other factors

Protective Factors	Severe Injury Risk Reduction	
Boys Grades 6-8		
Access to at least two parks 23%		
People would not take advantage of them	26%	
Girls Grades 6-8		
Minor or no problem with gang activity 39%		
People would not take advantage of them	33%	
Boys Grades 9-10		
Access to at least two parks	26%	
People would not take advantage of them	20%	
\$70,000-100,000 average household income*	41%	
Girls Grades 9-10		
People would not take advantage of them	34%	

Summary and Implications

* Compared with \$>100,000 average household income.

Several physical, social, and

socioeconomic aspects of the neighbourhood environment were associated with severe injuries among youth. This information could be helpful in designing the neighbourhood built environment and in particular, planning the use of school property, where to construct new schools, or how to improve the infrastructure in current neighbourhoods.

Physical environment

Access to parks was the most important physical neighbourhood characteristic in relation to severe injury. The presence of at least two parks in the school neighbourhood was associated with fewer injuries, especially for boys. Boys may be more physically active in the neighbourhood than girls, and if no/few parks are

available, they may be exposed to more hazardous playing areas (e.g., on the street, parking lots). For girls, the presence of vacant or shabby buildings was important. This can be related to neighbourhood safety and crime level¹⁵, which may constitute a more hazardous environment for girls than boys.

The lack of association between severe injuries and presence of heavy traffic in the school neighbourhood may be partially explained by the fact that many schools are located in areas where traffic calming measures have been implemented (e.g., speed bumps, lane narrowing) and that school zone speed limit restrictions may reduce the number of traffic related injuries near the school.



Social environment

The degree of social capital in a neighbourhood was an important risk factor for severe injury. Injuries were more frequent among students who perceived their neighbourhoods to be unsafe, with weak social ties and poor trust between neighbours. In particular, feeling that people would take advantage of them was related to severe injuries for all surveyed boys and girls in all grades. Moderate to major gang activity was also associated with a higher likelihood of severe injury for girls in grades 6-8.



Fostering a sense of community within the school neighbourhood might help to shift this perception. Other social factors such as trusting neighbours and feeling safe to play outside could also be addressed by fostering greater community cohesiveness, starting at the school level.

Socioeconomic environment

Students attending schools in neighbourhoods with lower SES tended to have greater proportions of severe injury. However, there were some notable exceptions. For example, older boys from the most affluent neighbourhoods suffered more injuries than their peers from lower income areas. This may reflect potentially higher participation rates in sports activities, particularly expensive sports such as hockey, skiing, and snowboarding which are known to have high rates of injury¹⁶. Also, in contrast to younger students, grade 9-10 students had fewer severe injuries if they attended schools in neighbourhoods with a high, as opposed to low, proportion of single-parent families. The family situation may be less important for older students as they shift their sources of influence to individuals outside their family¹⁷.

Key issues of concern

- 1. Physical characteristics of neighbourhoods that were associated with an increased likelihood of severe injuries included the absence of parks for boys and the presence of shabby buildings for girls.
- 2. Social characteristics, including a lack of trust, fear of being taken advantage of by neighbours, feeling there are no good places to spend free time and the neighbourhood is not safe to play in, were associated with a greater likelihood of severe injury.
- Students attending schools in low SES neighbourhoods (with high proportions of families with low income, less education and single parents) tended to have a greater number of severe injuries. However, severe injuries were also more frequent among grade 9-10 boys in neighbourhoods with high average household income and among grade 9-10 girls in neighbourhoods with higher education.

Key issues to celebrate

- 1. Many neighbourhood characteristics shown to be related to severe injury risk can be modified.
- 2. Making physical changes to the environment, such as creating more parks and upgrading shabby houses or buildings, could help to create environments where youth feel it is good to spend free time and safe to be outside.
- 3. Fostering neighbourhood relationships and emphasizing community-based activities could help address some of the social aspects of neighbourhoods that were associated with greater numbers of severe injuries, such as trust, and fear of being taken advantage of.

Closing Thoughts

Neighbourhoods have an important influence on youth's injury risk. The exploration of different features of the neighbourhood context provides insights and opportunities for injury prevention at the community level. This information can be used to inform the designing or upgrading of physical characteristics, and the development or enhancement of social and socioeconomic characteristics of a neighbourhood. It should be remembered that physical, social and socioeconomic characteristics of a neighbourhood are likely to interact

so that a change in one may influence other aspects. For example, changing the physical environment through the creation of parks may also improve the social capital of the neighbourhood, and together these factors may play an even greater role in protecting youth from injury. A unique finding was that some physical and social characteristics of neighbourhoods, such as presence of garbage or drinking/drug use do not appear to be associated with the risk of a severe injury among the students. Findings also suggest that opportunities exist to alter neighbourhood characteristics that are associated with injury risk and that multiple community members can contribute including schools, community organizations, city and transportation planners, parents, and youth themselves.

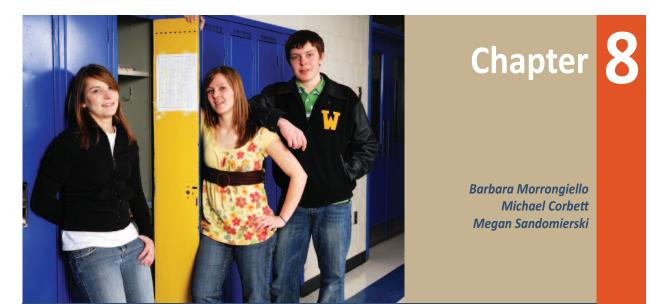


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The Influence of Peers on Youth Injury

Description of the Injury Problem

Throughout childhood, there are many different situations and characteristics of peer contexts that are known to influence risk-taking¹⁻³. These risks extend into adolescence⁴, a time during which young people are especially vulnerable to injury. Peer influences take on increasing importance throughout childhood and peak during adolescence. Indeed, some have

argued that the greatest risk of injury to youth arises from the influence of other youth⁵.

The Peer Context

Peers play an important and unique role in children's development. Influences of peers on child health can have both short-term and long-term effects on socialization, cognitive abilities, and academic performance⁶. Throughout the elementary and high school years, children are increasingly permitted to share more time with friends, without direct supervision by an adult. In fact, friendships gain in importance as children age and, during adolescence, peers can have more potential impacts on the health of youth, even when compared with parental influences⁷.



Many injuries occur to young people when they are making independent decisions about risk behaviours. Such decisions are often made in the company of peers⁸. Youth often select friends and romantic partners who share common interests and are similar to themselves. They also typically select close friends who have similar tolerances for risk-taking².

Social norms can have powerful influences on risk behaviour. Hence, risk-taking is often a shared activity that youth engage in with friends. With these findings in mind, the current chapter considers social and behavioural aspects of peer relations and how these peer factors relate to frequency of injury during adolescence.

What are We Reporting in This Chapter?



This chapter focuses upon the ways in which peers may influence risks for injury among young people. Students provided answers to a number of questions about peers and peer relationships. These included questions about having close friends, spending time with friends, and engaging in risk-taking behaviours with friends (e.g., drinking, smoking, using cannabis). Responses to these items were related to injury experiences, including "any injuries" (i.e., all injuries requiring medical treatment) and "severe injuries" (i.e., requiring medical treatment such as the placement of a cast, stitches, surgery, or an overnight stay in hospital and/or resulting in missing at least five days of usual activities). In addition, the chapter

also examines inter-relations between peer factors and select family factors. This leads to the identification of a number of aspects of the peer context that are risk and protective factors for injuries. When peer and family characteristics are both considered *simultaneously*, this provides a closer approximation to the lived experience of adolescents.

Our findings were collapsed across grades and between the sexes when there were no differences in injury patterns between these groups.

Social Factors Associated With Injury

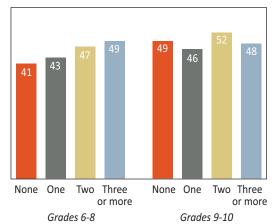
To capture the extent to which aspects of the peer context influence injury risk, we examined a number of social factors and compared the frequency of injury and severe injury reported in different groups of students. Social factors included the number of close friends a student reported, the frequency of time spent with friends after school, the number of evenings per week spent with friends, and the amount of time spent

communicating with friends by phone, text message or on the Internet. Patterns by sex and grade were examined, and the most striking findings are reported here.

8.1 Percent of any injury by boys' number of close male friends



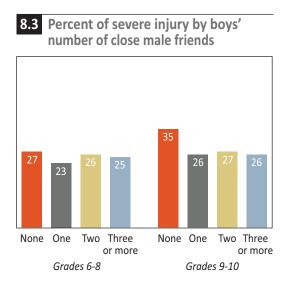
Having different numbers of close female friends was not associated with change in injury risk for any of the grades or for either sex at any grade. However, the number of close male friends a student reported was influential. For boys in grades 6-8, a general increase (about 8%) was observed in the occurrence of "any injury" as the number of close male friends increased from none to three or more (Figure 8.1). This same trend was not found in older boys in grades 9-10.



Regardless of grade level, the occurrence of "any injury" among girls increased as the number of close male friends increased (Figure 8.2).

For severe injuries, having at least one close male friend protected against injury among boys in grades 9-10 (Figure 8.3). That is, the more close male friends older boys had, the fewer severe injuries they experienced. The proportion of severe injuries among grade 6-8 boys did not vary by their number of close male friends.

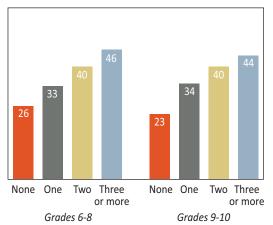
Having close male friends was a risk factor for severe injury among girls in both grade levels (Figure 8.4). The most notable difference was between those having no close male friends and those having three or more. This increase was 12% for both younger and older girls.



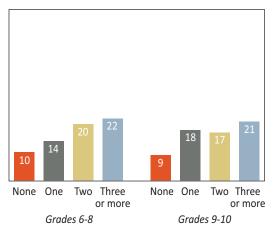
Number of days with friends after school

For boys and girls, regardless of the grade, spending greater amounts of time with friends after school was a risk factor for "any injury" (Figure 8.5). The increase in injury risk from no days with friends after school to 3 or more days was about 17% for both boys and girls.

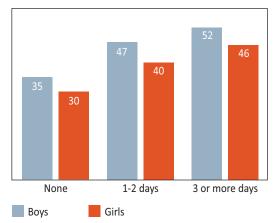




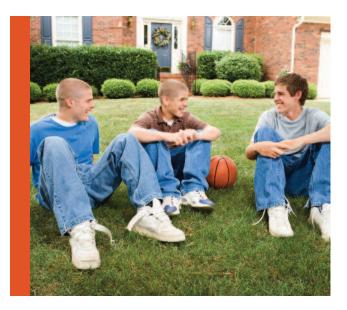
8.4 Percent of severe injury by girls' number of close male friends







Consistent with Figure 8.5, more time spent with friends after school was a risk factor for "any injury" for all young people regardless of sex or grade. Figure 8.6 shows the relationship between any injury and number of days with friends after school by grade level.



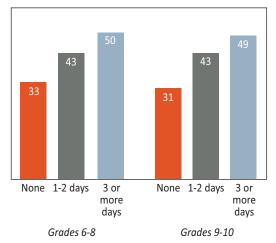
The association between severe injury and number of days with friends after school by sex was also examined (Figure 8.7). There was a consistent increase in "severe" injuries reported by boys as their time with friends increased (14% increase). The pattern was weaker among girls (9% increase).

There was no difference in severe injury by number of days spent with friends after school when divided by grade.

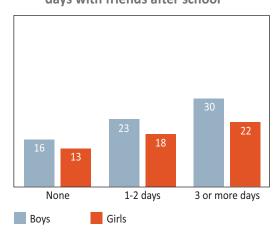
Evenings out with friends

For both boys and girls, an approximately 20% increase was observed for "any injury" between those who spent at least 3 evenings with friends compared with those who spent no evenings with friends (Figure 8.8). These findings were consistent for all grade levels.

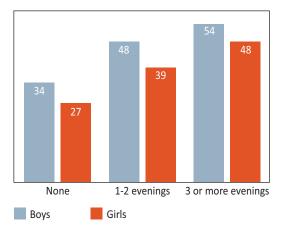




8.7 Percent of severe injury by number of days with friends after school





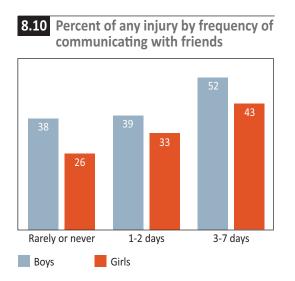


Severe injury was also associated with the number of evenings out with friends (Figure 8.9). For severe injury, the increase in injury occurrence from none to 3 or more evenings out was about 15% for boys, while for girls it was about 11%.

The pattern for severe injury was similar across the grade groupings. There was a 13% increase in severe injury risk, as the number of evenings out with friends increased, for both students in grades 6-8 and grades 9-10.

Frequency of communicating with friends

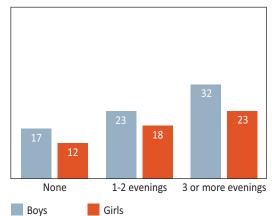
Students were asked how often they talk with their friends on the phone, send them text or email messages, or have contact through the Internet (Figure 8.10). More frequent communication with friends was a risk factor for "any injury" for both girls (17%) and boys (14%).



Both age groups showed a large increase in the proportion of "any injury" by frequency of talking with friends (grades 6-8: 13%; grades 9-10: 14%). Frequency of communicating with friends was also examined in relation to "severe" injuries. Among boys, the proportion of "severe" injuries increased 11% from 'rarely or never' talking with friends, to '3 to 7 days' talking with friends (Figure 8.11). Among girls, this increase was 8%. The greatest increase in risk occurred between 1 to 2 days and 3 to 7 days for both sexes.

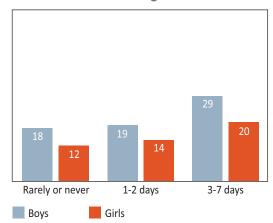


8.9 Percent of severe injury by evenings out with friends after school









Relations Between Risk-Taking Reported by Youth and Their Friends, and the Occurrence of Injury

Most youth partake in the same behaviour as their peers. In this section, risk-taking behaviours (i.e., drinking alcohol, smoking, and cannabis use) are examined. We explored findings for a young person's own risk-taking and the risk-taking of their peers. We placed

Table 8.1: Four groups of youth and peer risk-taking			
Group #	Did the young person themselves report engaging in the risk-taking behaviour?	Did the young person report that their peers engaged in that behaviour?	
1	NO	NO	
2	NO	YES	
3	YES	NO	
4	YES	YES	

young people into four groups based on whether they themselves engaged in the particular risk-taking behaviour and whether they had friends who in engaged in that behaviour. Table 8.1 provides the explanation for interpreting the findings for the four groups.

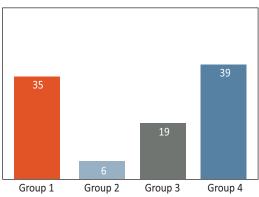
This kind of analysis helps us further explore the influence of peers on risk-taking. We then compared the injury and severe injury experiences for the four groups. This analysis was only done for grade 9-10 students because these questions were not asked of the younger participants in the HBSC study.

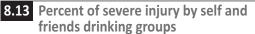
Drinking

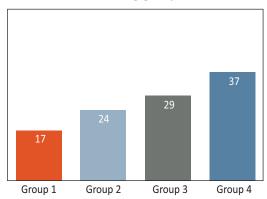
Figure 8.12 shows the frequency of youth in the four groups (as explained in **Table 8.1**). The largest identified group (39%) was group 4 – youth who reported having been drunk and their friends also have been drunk. The second largest group (35%) was group 1 – youth who have not been drunk and also reported that their friends have not. The third largest group (19%) was group 2 – youth who have not been drunk, but report friends who have done so. Finally, the smallest group (6%) was group 3 – youth who report having been drunk, but friends who have not.

Next we examined "severe" injury experiences in the four groups (Figure 8.13). Overall, youth in group 4 – who drink and who have friends who also drink – had the highest percentage of severe injuries (37%). This was followed by youth in group 3 – who drink but who report that their friends do not (29%). Youth who never drink were injured less often, with those having friends who also do not drink (group 1) getting injured the least (17%), and those with friends who DO drink (group 2) being injured more often (24%).

8.12 Percent of youth drinking by friends' drinking



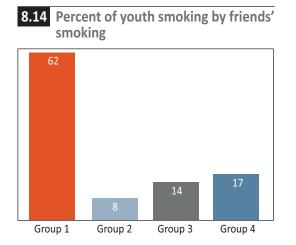


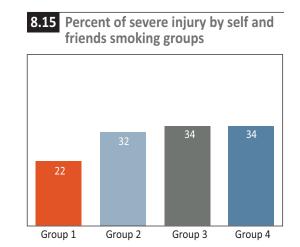


Smoking

Figure 8.14 shows the proportion of youth who smoke cigarettes in combination with reports of smoking by their friends. Similar to drinking, youth appear most likely to behave in the same manner as their peers. Most youth (62%) have not smoked and neither have their friends (group 1). The second largest group (17%) is that of youth who have smoked and who have friends who have also smoked (group 4). The third largest group (14%) consists of youth who have not smoked, but whose friends have (group 2), followed by youth who HAVE smoked but whose friends have not (group 3, 8%).

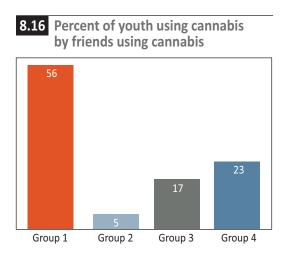
Youth who smoke experienced the greatest number of "severe" injuries, irrespective of their friends' reported experiences of smoking. The least commonly injured group is group 1, those youth who do not smoke and who have friends who also do not smoke (Figure 8.15).





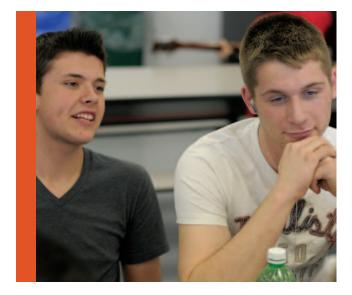
Use of cannabis

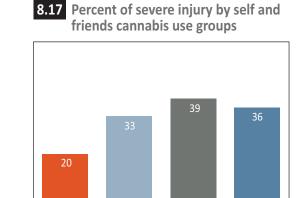
Following the same trend observed for both drinking and smoking, youth tend to behave similarly to their friends with respect to using cannabis (Figure 8.16). The largest group (56%) was youth who do NOT smoke cannabis and neither do their friends (group 1). The second largest group is group 4 – youth who do smoke cannabis and their friends also do (23%).





When examining severe injury experience in the four groups, the greatest number of severe injuries occurred in occurred in group 3 where young people used cannabis but their firends did not (Figure 8.17). Youth who do not smoke cannabis and whose friends also do not smoke experience the fewest injuries (group 1). A clear risk factor for "severe" injury among those young people who did not use cannabis was a report that friends smoked cannabis.





Group 2

Group 3

Group 4

Group 1

Modeling Risk and Protective Factors for Injury

Thus far, this chapter has reviewed the influence of several individual risk factors on injury outcomes. Although it is important to consider such factors in isolation and examine how they individually relate to injury, in reality, risk and protective mechanisms seldom occur in isolation. Thus, it is critical to examine how multiple factors simultaneously influence injury risk. To this end, several analyses were run predicting "any injury" and "severe injury" outcomes.

First, eight preliminary analyses were conducted, including: four 'risk factor' models and four 'protective' models. Next a combined model was constructed. Only risk and protective factors associated with the peer context were included.

Findings from the modeling suggested that males were consistently at greater risk of injury than females in all models after controlling for other protective factors. Age was not found to be a particularly strong predictor of injury.

Protective factors showed some consistency across models but varied somewhat between the samples. Generally, the two models that used the full sample showed more varied protective factors. For all models, involvement in a sport club or team was a strong protective factor. Among grades 9-10, participation in a sport club or team seemed to be slightly more protective. Additionally, for the full sample, those involved in voluntary service, youth clubs, and other clubs were 10%, 12%, and 14%, respectively, less likely to report "any injury" than those not involved in these clubs. For the "severe" injury outcome, only involvement in "other clubs" was protective, showing a 32% lower likelihood of injury for the full sample, and 41% for the grades 9-10 group.

For all models, the statistically significant risk factors, after controlling for the protective factors outlined above, were consistently related to peer interactions. The number of close male friends was a significant predictor of both "any injury" and the "severe" injury outcomes. Reported number of female friends was only a risk factor for "severe" injuries. Additionally, exposure to friends during the evenings was a risk factor in all of the models. Even talking on the phone and texting was related to elevated injury risks.

In addition to the number of and exposure to friends, reported peer risk-taking behaviours were also risk factors for youth injury. The frequency of peer risk-taking was measured on a 3-point scale ranging from "never or rarely" to "sometimes" to "often". Increases



in the frequency with which close friends "got drunk" were associated with increases in any injury and severe injury outcomes. Similar patterns were observed for the variable "close friends use drugs to get stoned".

These models suggest that risk factors related to peer exposure and peer risk-taking increase the likelihood of injuries, even when other protective factors are considered simultaneously. Thus, the mechanisms that lead to injury and protect from injury are likely quite different, because they both predict the occurrence of injury in unique ways. Injury experiences are clearly affected by youths' connections with peers.

Summary and Implications

These Canadian findings highlight the important role that peers play and a number of ways they may influence risks for youth injury.

Social factors

Youth who spend more time with male friends generally experience more injuries. When it comes to severe injuries, having close male friends appears to be a protective factor for older boys, and a risk factor for girls. Older adolescents may take part in, and



see value in, behaviours aimed at protecting friends from taking risks that could lead to injury¹⁰. For some risk behaviours, adolescents who do not engage in them may positively influence same sex friends to also refrain from risk-taking¹¹. However, the same general patterns were not observed among young males. While much of the literature on peer influence focuses on same sex groups, girls have been found to be more likely than boys to receive dares about health and injury risk behaviour from peers of a different sex¹². Compared with girls, boys hold riskier perceptions, they make riskier decisions about physical tasks, and they are more likely to view their personal injury risk during physical activities as less than peers^{3,13}. On the other hand, girls are more influenced than boys by the facial expressions of peers in potentially risky situations¹³, and when convincing peers to change their decisions about risk-taking, boys have been more likely to focus on how fun an activity is¹. It could be, therefore, that girls are influenced by boys' riskier behaviours or persuasions in ways that are different from boys.

Spending more time with friends and communicating with them more is associated with increased risks for injury, perhaps because at these ages supervisors are not often present when youth are engaged with friends. Children can be convinced by their best friends to take more risks², and simply having peers around has been found to increase children's decisions towards physical risk-taking³. By spending more time with friends, after school or in the evenings, youth may be exposed to more injury risk situations. It is also likely that more time with friends promotes closeness in these relationships. Quality of friendships is shown to be related to one's ability to positively influence a best friend to engage in more risk². Past research shows that chat room use¹⁴ and, for boys, spending more time speaking with friends on their home phone line¹⁵ are related to various types of risk-taking amongst adolescents.

Risky behaviours

Not surprisingly, having friends who participate in risky activities is related to youth engaging in these practices as well, and drinking alcohol and smoking cigarettes or cannabis are major risk factors for injury in the peer context. Alcohol use by young people is clearly related to that of their friends', with the likelihood being greater if their friend also drinks¹⁶. Clearly, abstinence from alcohol use by young people in combination with their friends also abstaining is protective from the occurrence of injury. Others have also found that the relation between one's alcohol intake and that of their friend's is stronger in those who engage in high levels of risk-taking¹⁶. Past research suggests that adolescents' cigarette use is associated with their friends' use, as is cannabis use¹¹. Adolescents often have friends who are part of the same peer group, and the type of group that one belongs to can relate to the likelihood of engaging in various health risk and risk-taking behaviours. Interestingly, when youth and their friends both engage in these behaviours their risk is heightened and there are more injures. Not engaging in such risk behaviours and having friends who also do not, are protective factors associated with fewer injuries. Understanding how peers come to influence youth risk-taking and injury has important implications for injury prevention and intervention efforts.

Key Issues of Concern

- 1. Peers have a significant influence on a young person's injury risk.
- 2. The more frequent a young person communicates and spends time with their friends, the greater the injury risk.
- 3. Young people who do not engage in health risk behaviours such as alcohol use or smoking are still at increased risk for injury if their peers engage in these activities.
- 4. Among girls, having close male friends appears to increase the risk for injury.

Key Issues to Celebrate

- 1. Among older boys, having close male friends is a protective factor against injury.
- 2. There is a significant number of young people who report not using alcohol, not smoking or using cannabis and who have peers who similarly abstain, and these young people have the lowest injury risk.
- 3. With the significant influence the peer context can have, it represents an important avenue for injury prevention intervention.

Closing Thoughts

The current findings suggest that there is merit in exploring social-contextual factors when creating injury prevention programming targeting youth, rather than narrowly focusing on the individual or simply targeting broad policy initiatives (e.g., laws mandating safe, or abolishing, risk behaviours) and hoping that youth comply. Research on best friends has shown that youth are most prone to be influenced about risk-taking from others with whom they share a valued relationship². This finding, coupled with evidence that peers engage in risk practices together and many injuries to



youth occur when they are with peers, strongly suggests that promoting a collaborative and shared commitment to safety among friends may prove to be an effective approach for evoking attitudes that favour safety practices. Hence, targeting dyads and/or groups of friends in ways that deter risk-taking may produce the greatest reduction in injuries during adolescence. Moreover, risk factors for injury vary somewhat for boys and girls and, therefore, targeting to discourage risk-taking may need to vary for boys versus girls.

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By Ian Pike, Shannon Piedt, Colleen Davison, Kelly Russell, William Pickett and a Panel of Child Injury Prevention Stakeholders

Chapter

Summary Observations

The overall goal of *Injury among Young Canadians: a National Study of Contextual Determinants* is to report nationally representative adolescent health data in order to raise awareness of related injury issues, and to support critical evidence-based actions to prevent injuries in this population. These actions will require multidisciplinary collaborations to support policy development, further research and clear decision-making for injury prevention.

These observations refer to injury prevention aimed at children and youth in grades 6-10 in Canada. It is acknowledged that high quality, effective, and evidencebased policies and programs aimed at children and youth already exist. A list of evidence-based interventions can be found at the Canadian Best Practices Portal by using keywords such as bullying or youth drug and alcohol (http://66.240.150.14/intervention/search-eng.html).

"There is a wide range of issues to be concerned about when thinking about injury prevention and this report really gives readers a reason to care." (Youth Advisory Team Member)

Those taking action are strongly encouraged to use youth engagement principles and practices, and evidencebased programming that is collaborative with youth, whenever possible. Youth engagement resources can be found through the Centres of Excellence for Children's Well-Being: Youth Engagement website at http://www.tgmag.ca/aorg/printmaterials_e.php#centre.

Parachute Canada's Youth Advisory Team (YAT) was engaged in the development of this chapter. They are a group of young Canadians aged 15-25, who are passionate about the issue of injury in Canada and contribute to special projects for the organization. In addition to providing feedback on the chapter, specific comments from the YAT are found in textboxes throughout this chapter.

"There were two accidents and three people died within a few days of each other within the same 500m of a back road this summer. A real eye opener for a lot of the youth here was driving on the road to the spot where there's memorial crosses for these people." (Youth Advisory Team Member) **Observation 1:** Injury remains a leading public health priority in terms of the prevalence of injury events reported, the extent and consistency of the problem observed in groups of young people across the country, the numbers of young people who seek formal medical care from the health care system, and in terms of the extensive amount of time lost from school or other usual activities.

Organizations that lead injury prevention efforts must be supported. In order to prevent injuries and enhance the lives of youth, it is necessary to change public attitudes around the

> acceptable frequency of injury events; the risk factors and causes

of injury; the types and severities of injuries; the life-long impact that injuries can have; the time lost from education and other healthy activities; the pressure that injuries add to the health care system; the economic burden to society and families; and the fact that the vast majority of injuries are preventable.

Observation 2: Comprehensive injury surveillance and injury prevention initiatives need to continue to monitor and evaluate outcomes and identify new and emerging patterns of youth injury.

Like chronic and infectious disease surveillance, it is critical that injury trends and patterns, which include social and contextual determinants, are monitored and evaluated over time. Efforts to collaborate and share injury data and information will increase understanding and the ability to take strategic actions to reduce and prevent injuries.

Observation 3: The role of government in injury prevention through the development and enforcement of good policy is essential.

"A school initiative could be put in for a day course for students to go over things like ATV-ing, 4x4ing and the fun but also the danger it could be." (Youth Advisory Team Member)

"I totally agree that the

prevention campaigns be

(Youth Advisory Team Member)

organizations that lead injury

"supported" – but how? These

organizations need money to do the

work they are being asked to do."

Regulatory and evidence-informed policy solutions are important for the prevention and control of injuries. Examples include, but are not limited to, policies that promote training and safe operation of motor vehicles and off-road vehicles, reduction of impaired driving both on roads and in off-road situations, helmet use during wheeled activities, skiing, and snowboarding, and concussion prevention and management.

Observation 4: Efforts are needed to minimize the use of alcohol and drugs by youth. This includes efforts to address the culture that promotes alcohol and drug use, controlled regulation of alcohol sales, education on youth substance abuse and high-risk behaviours, and establishment of programs and services to address addictions.

Services, regulations and programs that address the use and abuse of alcohol, prescription and illicit drugs are critical. Substance use can lead to increased risk-taking and impairments that leave young people vulnerable to major injury. The recreational use of drugs and alcohol among passengers and drivers of off-road vehicles is a concern particularly in rural settings. Alcohol and drug use is also a marker for other lifestyle behaviours that lead to higher risk of injury.

Observation 5: Injuries were more common among youth who reported illicit or prescription drug use, binge drinking or whose friends abused drugs or alcohol.

Public health personnel, police liaison officers, Parent Advisory Councils, school districts, municipalities and youth servicing agencies can assist governments and funding agencies by advocating for, leading or supporting initiatives to address substance use and promote associated harm reduction programs as a protection against injury.

Observation 6: Policies, programs and services that increase food security and reduce family dysfunction are important.

This report has noted the relationship between injuries and youth of low socio-economic status or who go to school or to bed hungry. Among boys in grades 9-10, for example, those who reported often going to school or bed hungry were four times more likely to also report one or more home injuries. Efforts to reduce injury must be multifaceted and include research (see Recommendation 17 below), food security and other family support programs.

Observation 7: Injury researchers need to collaborate with medical and social welfare professionals to better understand injury risks and social disparity risk factors leading to home injuries, particularly among youth in foster care, and develop concrete recommendations for injury prevention initiatives based on this understanding.

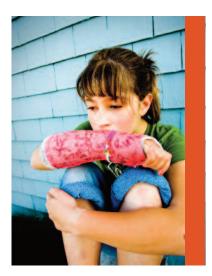
"Implementation of a program in middle and high school would be a great idea as this is when the drugs are first being initiated in the teens lives in most cases." (Youth Advisory Team Member) "It is almost given that many teens are going to try drugs – it's in their nature of feeling "invincible". Instead of trying to make alcohol and drugs less available which then in turn makes kids want to rebel and try these things – which can then lead to serious abuse of alcohol & drugs; a different approach may be to provide information about the drugs so that they're aware, and provide knowledge of how they could test drugs if they wanted to try them." (Youth Advisory Team Member)

"Prescription drugs are such an epidemic right now among our youth. It is really bad, our younger population are using fentanyl patches to get high." (Youth Advisory Team Member)

Approximately 12% of all youth injuries occur within the home and yard setting and not all youth are at equal risk of sustaining a homebased injury (see recommendation 6). A greater proportion of younger girls and older boys residing in group homes or foster care, for example, reported more injuries and severe injuries than their peers who were not in foster care. Injury prevention efforts need to be informed by greater understanding of the factors leading to these home injuries.

Observation 8: Examining the relationship between characteristics of the school setting and injury risk is extremely important.

The school setting is an ideal place to integrate and evaluate injury prevention efforts, since children and youth can become involved in injury prevention initiatives at school, and many activities that can lead to injuries (e.g. playground use participation in school sports) occur in this setting. Injury prevention education (e.g. bullying prevention, suicide prevention, drowning, burns, motor vehicle, sports injuries) could be further integrated into the school curriculum for grades 6 to 10 (and ideally from Kindergarten). School policies could also be integrated to protect students from school-related injuries.



Observation 9: Understanding the scope of youth injury in a community is important in order to implement and evaluate evidence-based injury prevention policies, programs and initiatives.

Every community has groups who are at higher risk for injury, such as youth from lower socio-economic status families or boys from affluent families who engage in high-risk sporting activities. Local injury stakeholders need to work together with the researcher community to target and evaluate injury prevention initiatives towards high-risk groups.



Observation 10: Collaborations between those promoting physical activity and play, and injury prevention partners are essential to ensure safe, yet stimulating environments for healthy development.

Physical activity and play are essential to healthy development among children and youth, but may be accompanied by increased risk of injury. Collaborations between those promoting physical activity and play, and injury prevention partners should integrate injury prevention into the promotion of healthy physical

activity for children and youth. Examples include: redesigning school and community playing fields, play spaces and active transportation routes; informing school policies regarding bullying and supervision; providing return-to-play guidelines; providing sport-specific injury prevention; and integrating bullying interventions into physical activity promotion.

Observation 11: There is a need to work with youth to create safe physical environments where youth want to spend time.

"I love the idea of introducing injury prevention education (i.e., bullying prevention, suicide prevention, drowning, burns, motor vehicle, sport injuries) into the school curriculum for grades 6 to 10." (Youth Advisory Team Member)

Development of spaces for physical activity and play can positively influence sense of community and foster trust in neighbourhood, which is important for injury reduction. In addition, the provision of environments promoting physical activity can have positive influences on other health outcomes such as obesity.

Observation 12: There is a need to continue to implement and support anti-bullying and anti-violence policies and programs that target perpetrators, victims and bystanders.

This report found that children and youth who reported being bullied were up to twice as likely to be injured than those who did not report being bullied. This association was particularly strong for boys in grades 6-8 and girls in grades 9-10. School administrators must lead in the delivery of appropriate consequences for bullying behaviours. "The role of coaches needs to be here. Not just them using proper equipment, stretching, staying hydrated, etc. for injury prevention. I'm talking about the winning is more important than a player's health mentality – pushing athletes even though they are injured – calling them down if they don't "play through the pain" and "take one for the team", even though it could have a long-term and life altering negative impact on the athlete." (Youth Advisory Team Member)

Observation 13: Peer-mentorship programs that address the social context of the school environment and improve feelings of belonging and safety are needed.

This report found a relationship between injury and emotional well-being, such as not feeling respected or not belonging at school. Schools must work together with local youth serving agencies, Parent Advisory Councils and youth to create a culture that fosters inclusiveness, respect and improves tolerance of differences/diversity and discourages bullying. "Partnering kids who may have had similar pasts; these friendships can be lifelong and then kids have someone they can truly look up to and understand and the older kids may receive a sense of purpose that they were previously lacking." (Youth Advisory Team Member)

Observation 14: Understanding the fundamental determinants of youth injury is important, including surveillance to identify new patterns and trends, and interventions that target specific high risk and/or vulnerable populations, contextual determinants and risk and protective factors.

While this report provides some insights into the relationship between social and contextual determinants, risk and protective factors, and youth injury, more research is needed to enhance our understanding. Recommendations 15 to 19 are directed at the injury research community, including academic and applied researchers, policy makers and practitioners to develop innovative research projects that shed light on the following specific areas in relation to injury: substance use, high-risk youth, going to bed hungry, peer relationships and involvement in a sport club, youth club or voluntary service.

Observation 15: Research programs are needed to improve understanding of the culture that promotes the use of alcohol, illicit and prescription drugs for recreational purposes, and the impact on child and youth injury patterns and rates.

As stated in recommendations 4 and 5, alcohol, illicit drug and prescription drug use are increasingly important risk factors for adolescent injury. Further research will aid our understanding of where and how to intervene.

Observation 16: Research programs are needed to implement optimal methods to prevent injury among high-risk and/or vulnerable youth, including those from rural and remote regions; investigate recurrent determinants and patterns of injury; social disparities; and, risk and protective factors.



The risk of injury is not the same for all children and youth as some characteristics and behaviours increase or decrease risks for injury. In addition to level of family function, being bullied, involvement in high-risk sports, and use of alcohol, illicit and prescription drugs, this report found that the proportion of students reporting an injury increased as the population size of the city or town where they attended school decreased. Further research and evaluation is needed to inform targeted interventions for all high-risk children and youth, including those living in rural locations (<1,000 population). 94

Observation 17: Research programs are needed to investigate the relationships between going to school or bed hungry and the increased risk for injury among youth, with a particular focus on policy solutions.

Understanding of the relationships between food insecurity, family dysfunction and injury among youth will allow solutions to focus on some of these root causes.

Observation 18: Research programs are needed to illuminate understanding of the effects of various child and youth peer relationships and peer activities on injury risk.

"In these recommendations there is a lot of talk about the programs that need to be offered and I agree with that. Most places where higher risk youth go to hang out are non-profit agencies. These agencies usually have a hard time getting money just to keep their doors open." (Youth Advisory Team Member)

The current findings suggest that there is merit in exploring social and contextual factors when creating injury prevention programming. Among girls, having close male friends increases the risk for injury;

however, having close male friends is a protective against the occurrence of injury among older boys. As risk factors for injury vary for boys and girls, further research and evaluation is needed to inform targeted interventions.

Observation 19: Research programs are needed to understand child and youth involvement in sports and social clubs as a protective factor against injury.

Children and youth involved in voluntary service, youth clubs, and other clubs were 10%, 12%, and 14%, respectively, less likely to report injury than those not involved in these clubs. Research is needed to discern whether involvement is protective at the individual, interpersonal, and/or organizational level.



"We need to be <u>empowering youth</u> to take ownership to reduce the risks in their lives that lead to injury. NOT just educating them but empowering them and reminding them of the amount of control they have in the decisions they make." (Youth Advisory Team Member)

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Injury Among YOUNG CANADIANS:

A NATIONAL STUDY OF contextual determinants