Unintentional Injury Trends for Canadian Children

June 2016

Parachute
PREVENTING INJURIES. SAVING LIVES.

Introduction

As part of the 20-year anniversary of the Safe Kids Week campaign, this report highlights the burden of injury on Canadian children aged 0-14 years, using mortality data between 2003-2012 and hospitalization data between 2006-2010. *The Child and Youth Unintentional Injury 10 Year Review* produced by Safe Kids Canada in 2007 serves as a basis for this report.[1]

This report features Mortality and Hospitalizations trends (pg. 2), examines the burden of injury in the most current year of available data in the "Current Picture" (pg. 4) and provides a special focus on injuries that occur 'on road' (pg. 5).[2] Intended to inform a broad range of audiences such as injury prevention practitioners, researchers, policy decision makers, students and anyone interested in learning about the burden of injury on children; the report details counts, rates, and leading causes of injury hospitalization and deaths in children 0-14 over a period of time to highlight areas where injury prevention efforts must be focused.

UNINTENTIONAL INJURY TRENDS FOR CANADIAN CHILDREN: Key Messages

DEATHS
2003-2012

210 children died each year from preventable unintentional injuries

The good news? The death rate declined by **30%**

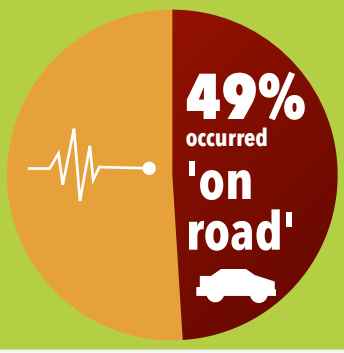
HOSPITALIZATIONS
2006-2010

16,464 children hospitalized each year from preventable unintentional injuries

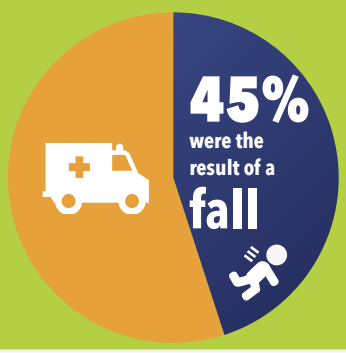
The good news? The hospitalization rate declined by **13%**

? LEADING CAUSE
of death and hospitalization

Of all UI-related deaths...



Of all UI-related hospitalizations...



$ COSTS
to Canadian economy, 2010

$380 million for 'on road' injuries

$1.2 billion for injuries from falls

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[1] Safe Kids Canada. (2007). Child & Youth Unintentional Injury: 10 Years in Review 1994-2003.

[2] 'On road' causes include pedal cyclists, motor vehicle occupants, pedestrians and other transport related injuries.

Unintentional Injury Trends

Mortality

Figure 1 shows trends in unintentional injury (UI)-related deaths for children aged 0-14 over a ten-year period. Between 2003-2012, **2098 children died** as a result of an UI. There were 261 UI deaths in 2003 and 183 in 2012, marking a **30% reduction**. The annual mortality rate decreased from 4.5 deaths per 100,000 in 2003 to 3.2 per 100,000 in 2012.

Figure 2 shows the leading causes of UI-related deaths for children over a 10-year period. **Other transport-related injuries (20%),**[3] **drowning and submersion (18%)**, and **suffocation and choking (18%)** were the leading causes of death for children aged 0-14 between 2003-2012, contributing to **56%** (1162) of all UI-related deaths over the ten-year period.

Unintentional poisoning (86%), fire, flames and hot substances (57%) and **motor vehicle occupant (48%)** saw the largest reductions in UI-related deaths between 2003-2012.

FIGURE 1

Trend in UI-related deaths among Canadian children aged 0-14, 2003 to 2012

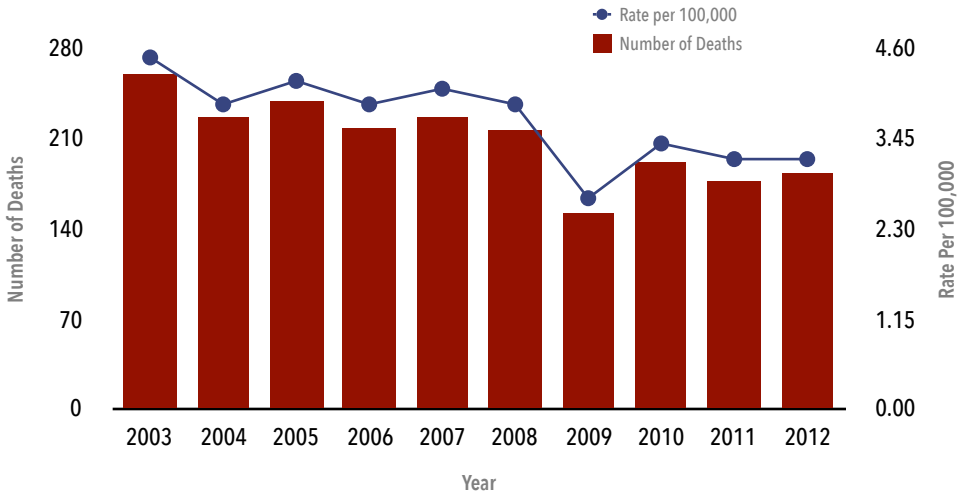
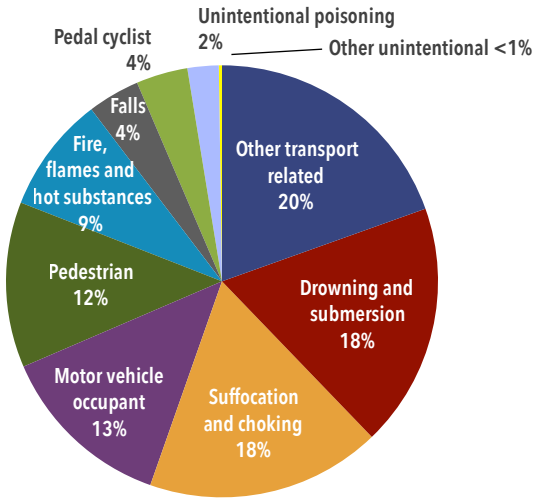


FIGURE 2

Major causes of UI-related deaths among Canadian children aged 0-14, 2003-2012



[3] The "other transport-related injuries" category includes all ICD-10 codes between V80-V89, V90-V94. Refer to Table 3 for a list of ICD-10 codes used to define each injury type.

Hospitalizations

Figure 3 shows trends in UI-related hospitalizations for children aged 0-14 over a five-year period. Between 2006-2010, 82, 321 children were hospitalized as a result of an UI. There were 17,876 UI hospitalizations in 2006 and 15,554 in 2010, marking a **13% reduction**. The annual hospitalization rate decreased from 316.1 per 100,000 in 2006 to 276.5 per 100,000 in 2010.

Figure 4 shows the leading causes of UI-related hospitalizations for children over a five-year period. **Falls (45%), other unintentional injuries,**[4] and **pedal cyclist injuries** were the top three causes of hospitalization between 2006-2010, contributing to over **70%** (63,480) of all UI-related hospitalizations over the five-year period. **Motor vehicle occupants (35%)** and **pedal cyclist (33%)** saw the largest reductions in UI-related hospitalizations between 2006-2010.

FIGURE 3

Trend in unintentional injury (UI)-related hospitalizations among Canadian children aged 0-14, 2006 to 2010

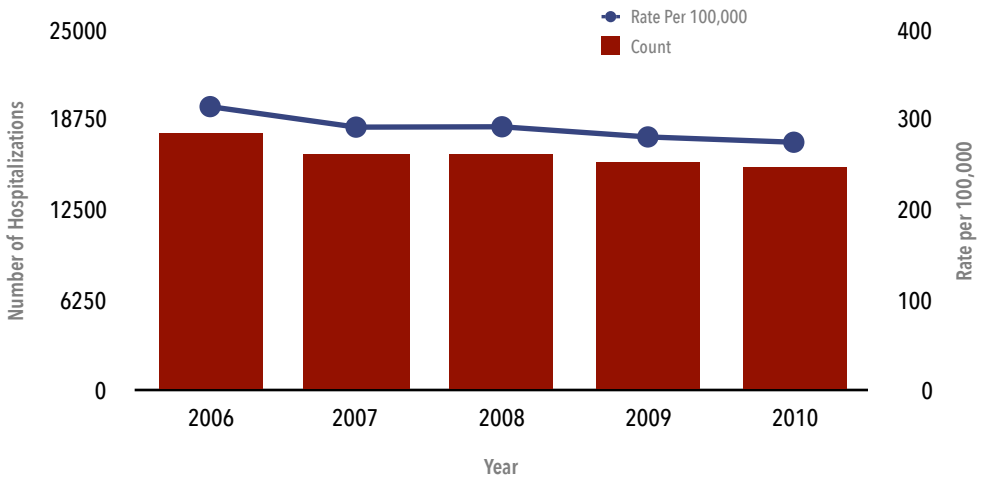
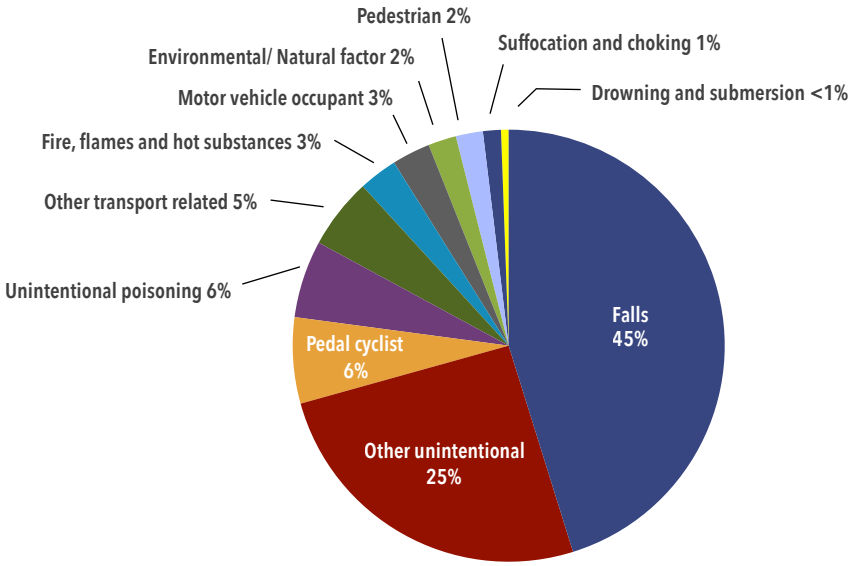


FIGURE 4

Major causes of UI-related hospitalizations among Canadian children aged 0-14, 2006 to 2010



[4] The "other unintentional injuries" category includes all ICD-10 codes between w20-w049, w50-w64, w85-w99, x58-x59 in addition to other external causes, foreign body, struck by object, machinery, cutting and piercing, firearms, explosions and overexertion. Please refer to Table 4 for a list of ICD-10 codes used to define each injury type.

The Current Picture

By most recently available data for deaths and hospitalizations, **183** children (in 2012) **died** and **15,554** children (in 2010) **were hospitalized** as a result of an unintentional injury.

Major Causes of Injury

Deaths - 2012

In 2012, 'on road' injuries contributed to **nearly 50%** of all unintentional injury (UI)-related deaths in children.[5] Other transport-related injuries were the leading cause of unintentional death for children aged 5-9 and 10-14.[6] Based on data from *The Cost of Injury in Canada,*[7] it is estimated that '**on road**' injuries to children cost the Canadian economy **$380 million** in 2012.

Table 1 provides a breakdown of the major causes of death for children by age-group (0-4,5-9 and 10-14) in 2012. When combined, drowning and submersion and suffocation and choking accounted for **over 40%** of all unintentional deaths for children aged 0-14.

TABLE 1

Major causes of UI-related deaths among Canadian children aged 0-14, 2012, by age group

	Age Range		
Cause of Death	**0–4**	**5–9**	**10–14**
1st	Suffocation and choking	Other transport related	Other transport related
2nd	Drowning and submersion	Drowning and submersion	Pedestrian
3rd	Pedestrian	Motor vehicle occupant	Motor vehicle occupant

Hospitalizations - 2010

In 2010, falls were by far the most significant cause of UI-related hospitalization in children across all age groups. Based on data from the *Cost of Injury in Canada,* it is estimated that in 2010, childhood falls cost the Canadian economy **$1.2 billion**.

Table 2 provides a breakdown of the major causes of hospitalization for children by age-group (0-4,5-9 and 10-14) in 2010. The leading causes of hospitalizations for children aged 0-14 in 2010 was **falls** (7017), **other unintentional injuries** (4265) and **'on road'** injuries (2328).

TABLE 2

Major causes of UI-related hospitalizations among Canadian children aged 0-14, 2010, by age group

	Age Range		
Cause of Hospitalization	**0–4**	**5–9**	**10–14**
1st	Falls	Falls	Falls
2nd	Other UI	Other UI	Other UI
3rd	Unintentional poisoning	On road	On road

Vulnerable Populations

Examining the burden of injury by the different age groups, can inform injury prevention efforts.

Children 0-4: Suffocation and choking and drowning and submersion were leading cause of death for children aged 0-4 in 2012 and accounted for 61% of all UI-related deaths. By contrast, falls, 'on road' injuries and unintentional poisoning were leading causes of hospitalization for this age-group in 2010.

Children 5-9: Other transport-related injuries were the leading cause of death for children aged 5-9 in 2012. These injuries accounted for nearly 40% of all UI-related deaths and nearly twice as much as the second leading cause (i.e., drowning and submersion). In 2010, falls were a significant and leading cause of hospitalization (i.e., 57%). When combined, falls and other unintentional injuries, accounted for 4 out of every 5 UI-related hospitalizations for this age group in 2010.

Children 10-14: 'On road' injuries accounted for nearly 3 out of every 4 UI-related deaths for children aged 10-14 in 2012. Falls were again the leading cause of hospitalization for children aged 10-14 in 2010. This age group also experienced a high proportion of hospitalizations due to other unintentional (31%) and 'on road' (25%) injuries.

[5] The 'on road' injuries category includes pedal cyclist, motor vehicle occupant, pedestrian and other transport-related injuries.

[6] The other transport-related injuries category includes all ICD-10 codes between V80-V89, V90-V94. Refer to Table 3 for a list of ICD-10 codes used to define each injury type.

[7] Parachute. (2015). The Cost of Injury in Canada. Parachute: Toronto, ON

'On Road' Injuries Trends for Canadian Children

'On road' incidents place a significant burden of injury on children. Children can be vulnerable road users regardless of whether they are motor vehicle occupants, pedestrians, pedal cyclists or users of other modes transport.

Trend analysis of the 10-year (2003-2012) mortality data as well as the 5-year (2006-2010) hospitalization data, both demonstrate the continued threat of injury children face while on the road. These numbers point to the need for increased and sustained measures to prevent on-road injuries in children.

'On-road' deaths - 2003-2012

Between 2003-2012, there were **1027** deaths relating to 'on road' injuries for children aged 0-14. Despite a **39% reduction** of 'on road' deaths between 2003-2012, it is estimated that **1 in 2 deaths** for Canadian children occurred 'on road' over the ten-year period.

Children aged 5-9 and 10-14 were the most at risk of dying from an injury on the road. For example, between 2003-2012, 'on road' injuries accounted for **59% and 67%** of UI-related-deaths for children aged 5-9 and 10-14 respectively.

Infants and young children are also at risk for dying from 'on road' injuries. For example, between 2003-2012, 'on road' injuries accounted for **30%** of UI-related deaths of children aged 0-4. **Nearly half (12%)** of these deaths were a result of pedestrian injuries.

"Other transport-related injuries" were most deadly,[8] as they were the leading cause of UI-related death for children aged 5-9 and 10-14 between 2003-2012 and **more than 1.5 times** higher than the next leading cause of death for both age groups.

'On-road' hospitalizations - 2006-2010

Between 2006-2010 there were a total of 13,691 hospitalizations relating to 'on road' injuries for children aged 0-14. Despite a **28% reduction** in 'on road' hospitalizations between 2006-2010, 'on road' injuries were still the third leading cause of UI-related hospitalizations for children aged 0-14 over the five-year period.

The risk of UI-hospitalization due to 'on road' injuries increased with age. For example, after falls and other unintentional injuries, 'on road' injuries contributed to the largest number of hospitalizations for children **aged 5-9** and **10-14** contributing to **4005** and **8183** hospitalizations respectively.

Finally, **39%** of all 'on road' UI-related hospitalizations for infants and young children **aged 0-4** were the result of motor vehicle occupant injuries.

Pedal cycle injuries were the most prevalent 'on road' cause of hospitalization for children **aged 5-9** and **10-14**. Between 2006-2010 pedal cycle injuries accounted for **45%** of all 'on road' UI-related hospitalizations for children **aged 5-9**.

[8] The "other transport-related injuries" category includes Other land transport accidents [ICD-10: V80-V89] and Water transport accidents [ICD-10: V90-V94]

Report Methodology

Data sources

Injury hospitalization data from CIHI were accessed from the following databases:

- Discharge Abstract Database (DAD), Canadian MIS Database (CMDB), Canadian Institute for Health Information. Retrieved from iDOT_ Injury-Related Hospitalization Tool, The Canadian Atlas of Child & Youth Injury Prevention.
- Hospital Morbidity Database (HMDB), 2006-2011. Quebec

Death data were accessed from Statistics Canada:Statistics Canada. CANSIM Table 102-0540 - Deaths, by cause, Chapter XX: External causes of morbidity and mortality (V01 to Y89), age group and sex, Canada, annual (number) Population Estimates were accessed from Statistics Canada:

- Statistics Canada. Table 051-0001 - Estimates of population, by age group and sex for July 1, Canada, provinces and territories, annual (persons unless otherwise noted)

External cause codes: International Classification of Disease

Analysis of overall mortality and hospitalization trends was based on data for all unintentional injuries. Injuries are classified according to categories developed by the World Health Organization's (WHO) International Classification of Diseases (ICD) coding system. Please refer to Tables 3 and 4 for a list of ICD-10 codes used to define each injury type.

Acknowledgements

We would like to express our gratitude to the following key partners for their contributions to the data and analysis used this report.

- Public Health Agency of Canada
- Child and Family Research Institute (British Columbia)

TABLE 3

Classification of death from injury by ICD-10 codes

Category	Cause of death	ICD-10 Code*
Pedestrian	Pedestrian injured in transport accident	V01-V09
Pedal Cyclist	Pedal cyclist injured in transport accident	V10-V19
Motor Vehicle Occupant	Occupant of three-wheeled motor vehicle injured in transport accident	V30-V39
	Car occupant injured in transport accident	V40-V49
	Occupant of pick-up truck or van injured in transport accident	V50-V59
	Bus occupant injured in transport accident	V70-V79
Other Transport-Related	Other land transport accidents	V80-V89
	Water transport accidents	V90-V94
Falls	Falls	W00-W19
Other Unintentional	Striking against or struck by sports equipment	W21
Drowning and Submersion	Accidental drowning and submersion	W65-W74
Suffocation and Choking	Other accidental threats to breathing	W75-W84
Fire, Flames and Hot Substances	Exposure to smoke, fire and flames	X00-X09
	Contact with heat and hot substances	X10-X19
Unintentional Poisoning	Accidental poisoning by and exposure to noxious substances	X40-X49

TABLE 4

Classification of hospitalization from injury by ICD-10 codes

Category	Cause of hospitalization	ICD-10 Code*
Other Transport-Related	Involves a device designed primarily for, or being used at the time primarily for, conveying persons or goods from one place to another. This includes land, water, air and space transport. Further breakdown for transport-related includes:	V01-V99, Y850, Y859
	Motorcyclist	V20-V29
	Other land transport	V80-V89
	Water transport	V90-V94
	Air and space transport	V95-V97
	Other and unspecified transport	V98-V99
On Road	Motor vehicle occupant	V30-V79
	Pedal cyclist	V10-V19
	Pedestrian	V01-V09
	Other transport-related	
Falls	Including falls on same level, and from various heights and objects, fall or dropped while being carried, fall involving wheelchair, ice skates, skis, skateboard, etc., fall due to pushing or collision with other person, diving or jumping into water (if injury other than drowning). Excludes falls from animals, burning buildings, fire, water (with drowning), machinery, transport vehicles, and falls onto sharp objects	W00-W19
	Fall involving ice and snow	W00
	Fall on same level	W01, W03, W04
	Fall involving skates, skis, skateboards	W02-W029
	Fall involving wheelchair and other walking devices	W05-W059
	Fall involving bed, chair and other furniture	W06-W08
	Fall involving playground equipment	W09-W099
	Fall on and from stairs/steps/ladder/scaffolding	W10-W12
	Fall from high level	W13-W15
	Other and unspecified Fall	W16-W19
Environment/ Natural Factors	Exposure to forces of nature such as exposure to excessive natural heat and cold, sunlight, victim of lightning, earthquake, volcanic eruption, avalanche, land slide and other earth movements, victim of storm, flood and other forces of nature.	X30-X39
Drowning and Submersion	Accidental drowning or submersion involving watercraft, fall or activity in water. Excludes watercraft incident not involving drowning or submersions and all other transport injuries; injuries due to diving and striking pool. Further breakdown for drowning includes:	W65-W74
	Drowning involving bathtub	W65-W66
	Drowning involving swimming pool	W67-W68
	Drowning involving natural water	W69-W70
	Other and unspecified drowning	W73-W74
Fire, Flames and Hot Substances	Injuries caused by fire and flames; hot appliances, objects or liquids; steam; acid burns. Unintentional burning by fire, smoke and fumes asphyxia; burns due to contact with hot objects, substances or caustics. Excludes fire in machinery, non-stationary transport and other vehicles, watercraft fires, radiation burns and electric current	X00-X19
	Fire in building or structure	X00, X02
	Ignition of highly flammable material/clothing	X04-X06
	Other and unspecified fire and flames	X01, X03, X08, X09
	Contact with hot drinks, food, fats and cooking oils	X10
	Contact with hot tap water	X11
	Contact with other hot fluids	X12
	Contact with hot household appliances	X15-X1509

Category	Cause of hospitalization	ICD-10 Code*
	Contact with other heat and hot substances	X13, X14, X16, X19
Unintentional Poisoning	Including unintentional overdose of drugs, medicaments and biological substances, poisoning by alcohol, chemicals, house products and other noxious substances. Excludes adverse reactions to drugs used properly and as directed. Further breakdown for unintentional poisoning includes:	X40-X49
	Unintentional poisoning by drugs	X40-X44
	Unintentional alcohol poisoning	X45
	Unintentional poisoning by solvent, hydrocarbons and their vapours	X46
	Unintentional poisoning by gases, and vapours	X47
	Unintentional poisoning by pesticides	X48
	Unintentional poisoning by other and unspecified chemicals and noxious gases	X49
Suffocation and Choking	Inhalation and ingestion of food or objects causing obstruction or of respiratory passage or suffocation; unintentional mechanical suffocation. Includes smothering and choking. Excludes ingestion of a foreign body without respiratory obstruction. Further breakdown for suffocation and choking includes:	W75-W84
	Unintentional hanging, suffocation and strangulation	W75-W76
	Suffocation due to cave in, falling earth, etc.	W77
	Inhalation of food, vomitus, and other objects	W78-W80
	Other and unspecified threats to breathing	W83-W84
Other Unintentional	Other unintentional	W20-W49, W50-W64, W85-W99, X58-X59
	Other external causes	Y89
	Foreign body	W44-W449, W4500, W45, W4509
	Struck by object	W20-W23, W50-W52
	Machinery	W24, W28-W29, W30-W31
	Cutting and piercing	W25-W27, W46
	Firearms	W32-W349
	Explosion/rupture	W35-W40
	Overexertion	X50

NOTE:

- * World Health Organization (WHO), International Statistical Classification of Diseases and Related Health Problems, Tenth Revision (ICD-10).
- Notes from the CANSIM Table 102-0540 –" The cause of death tabulated is the underlying cause of death. This is defined as (a) the disease or injury which initiated the train of events leading directly to death, or (b) the circumstances of the accident or violence which produced the fatal injury. This underlying cause is selected from a number of conditions listed on the death registration form. Counts in this table exclude deaths of non-residents of Canada."

Suggested citation:
Parachute (2016). *Unintentional Injury Trends for Canadian Children, June 2016*. Toronto: Parachute.

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