



CHILDREN AND YOUTH IN BRITISH COLUMBIA INJURY BY AGES AND STAGES 2003-2007

The British Columbia Injury Research and Prevention Unit (BCIRPU) was established by the Ministry of Health and the Minister's Injury Prevention Advisory Committee in August 1997. BCIRPU is housed within the Centre for Developmental Neurosciences and Child Health (N2N) and supported by the Provincial Health Services Authority (PHSA), the Child and Family Research Institute and the University of British Columbia (UBC). BCIRPU's vision is "to be a leader in the production and transfer of injury prevention knowledge and the integration of evidence-based injury prevention practices into the daily lives of those at risk, those who care for them, and those with a mandate for public health and safety in British Columbia".

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HIGHLIGHTS

Children and Youth in British Columbia: Injury by Ages and Stages 2003-2007 looks at the current injury mortality, hospitalization and emergency data to describe child and youth injury statistics and patterns in BC.

Injury is the leading cause of death among children and youth ages 0 to 19 years in BC. An average of 104 children and youth died annually from 2003 to 2007, with a further 6,625 hospitalized. Males continue to have significantly higher injury mortality and hospitalization rates than females.

The injury mortality rate among children and youth was 10.7 per 100,000 population from 2003 to 2007, being highest among males 15 to 19 years old. The injury hospitalization rate among children and youth was 679.7 per 100,000 population from 2003 to 2007, with rates nearly twice as high among males and highest among youth ages 15 to 19 years.

Leading causes of injury resulting in death included Drowning, Motor Vehicle Crash, Suffocation, Suicide and Homicide. Motor Vehicle Crash is the leading cause for ages 5 to 19 years while very young children are at higher risk of Drowning.

Falls was the leading cause of injury hospitalization for all ages. Second leading causes differed by age group: Struck by Object among ages 5 to 19 years; Foreign Body among very young children. Other leading causes included

Poisoning; Fire, Flames and Hot Substances; Motor Vehicle Crashes; Bicycle Injuries not involving motorized traffic; Attempted Suicide; and Assault.

Leading types of injury resulting in death included Asphyxia/strangulation, accounting for 17 percent of all cases. Drowning/immersion and Poisoning/toxic effect each accounted for 10 percent.

Fracture was the leading type of injury resulting in hospitalization among all ages. Second leading types of injury by age group were: Foreign Body for 0 to 4 year olds; Intracranial Injury for 5 to 14 year olds; and Poisoning and Toxic Effects for 15 to 19 year olds.

Societal costs of injury include both direct and indirect costs. Total cost of child and youth injury in BC based on 2004 data is estimated to be \$802.6 M, with direct costs at \$438.1 M and indirect costs at \$364.5 M. Intangible costs of injury can include pain and suffering, economic dependence, social isolation and depression

Injury rates among children and youth in BC were on the decline across all age groups from 2003 to 2007. The greatest downward trends were seen among 5 to 9 year old females and 10 to 14 year old males.

The BC provincial age standardized child and youth injury mortality rate from 2003 to 2007 was 6.8 per 100,000 population. Rates by Health

Authority in descending order are Northern (12.6), Interior (9.1), Vancouver Island (8.2), Fraser (5.7) and Vancouver Coastal (3.9)

The BC provincial age standardized child and youth injury hospitalization rate from 2003 to 2007 was 518.7 per 100,000 population. Rates by Health Authority in descending order are Northern (766.9), Interior (588.7), Vancouver Island (539.9), Fraser (381.1) and Vancouver Coastal (326.9).

Falls was the leading cause of injury hospitalization across regions and age groups. Foreign Body and Unintentional Poisoning were leading causes among 0 to 4 years olds, while Struck by Object appeared among the older age groups as well as Bicycle Injuries, Motor Vehicle Crashes, and Suicide Attempts.

This report describes the facts, trends and prevention evidence for injury among BC's children and youth by leading causes: Occupant Safety and Motor Vehicle Crashes; Young Drivers; Road Safety – Pedestrians and Cyclists; Falls – At Home and Play; Safety at Home – Suffocation, Burns and Poisoning; Sports and Recreation Injuries – As Best We See Them; Water Safety; Preventing Self Harm; and Preventing Assault.

The next steps for child and youth injury prevention in BC need to include a reinvestment in injury prevention in order to maintain the reductions in injury that have been demonstrated over the past several years.



EXECUTIVE SUMMARY

Children and Youth in British Columbia: Injury by Ages and Stages 2003-2007 describes child and youth injury in BC for 9 injury categories: motor vehicle crashes, young drivers, pedestrians and cyclists, falls, home safety, sports and recreation, water safety; self harm and assault.

Occupant Safety and Motor Vehicle Crashes

Child and youth passengers in motor vehicle crashes from 2003 to 2007 accounted for:

- 200 deaths (4.1/100,000)
- 1,904 hospitalizations (39.7/100,000)

Leading types of injury hospitalization included:

- Fracture
- Intracranial
- Internal organ
- Open wound
- Superficial

Across the five Health Authorities, hospitalization rates demonstrated significant downward trends from 2003 to 2007.

Best Practices currently target:

- Passenger restraint use, including child restraint seats, booster seats and seat belts
- Lower anchors and tethers for children (LATCH) systems
- The danger posed by air bags
- Primary enforcement laws
- Types of vehicle

Young Drivers

Young drivers 16 to 21 years old have twice the number of crashes as those 22 years and older. They account for eight percent of the driving population and 18 percent of all fatal crashes.

Contributing factors include:

- Driver inexperience
- Driving without due care
- Overestimation of ability
- Thrill seeking
- Risk-taking

Leading contributing factors for fatal crashes:

- Unsafe speed
- Alcohol

Best Practices currently target:

- Impaired driving/alcohol misuse
- Teenage drivers
- Graduated Driver Licensing
- Teen drivers and child occupants
- Motorcycles
- Other motorized vehicles

Road Safety - Pedestrians & Cyclists

Child and youth pedestrian injuries related to motor vehicle crashes from 2003 to 2007 accounted for:

- 36 deaths (0.7/100,000)
- 603 hospitalizations (12.3/100,000)

Leading types of pedestrian injury resulting in hospitalization included:

- Fracture
- Intracranial

Child and youth cycling injuries related to motor vehicle crashes and non-motor vehicle crash incidents accounted for:

- 14 deaths (0.3/100,000)
- 2,201 hospitalizations (45.2/100,000)

Leading types of cyclist injury resulting in hospitalization included:

- Fracture
- Intracranial
- Internal organ
- Open wound
- Superficial

No significant trends in pedestrian hospitalization rates were found across BC from 2003 to 2007. A significant downward trend was found for the cyclist hospitalization rate at the provincial level.

Best Practices currently target:

- Pedestrian safety
- Traffic calming
- Visibility
- Age of cyclists
- Promotion of bicycle helmet use
- Bicycle helmet legislation
- Non-legislative strategies to promote helmet use
- Peer and adult companion helmet use

Falls - At Home & Play

Child and youth falls injuries from 2003 to 2007 accounted for:

- 14 deaths (0.3/100,000)
- 10,571 hospitalizations (216.9/100,000)

Cause of fall injury hospitalization varied by age group. Among ages 0 to 4 years, falls were from:

- Furniture (49.3/100,000)
- Playground equipment (30.7/100,000)
- Stairs/ladders (17.6/100,000)

Among ages 5 to 9 years, falls were from:

- Playground equipment (105.2/100,000)
- Slip/trip/stumble (23.9/100,000)
- Furniture (20.9/100,000)

Among ages 10 to 14 years, falls were from:

- Slip/trip/stumble (40.2/100,000)
- Playground equipment (31.0/100,000)
- Same level (27.5/100,000)

Among ages 15 to 19 years, falls were from:

- Slip/trip/stumble (26.6/100,000)
- Same level (22.4/100,000)
- Stairs/ladders (12.6/100,000)

Leading types of injury resulting in hospitalization included:

- Fracture
- Intracranial
- Dislocation
- Open wound
- Internal organ
- Sprain and Strain
- Superficial injury

Significant downward trends for child and youth falls injury hospitalizations from 2003 to 2007 were found for:

- BC
- Vancouver Coastal Health
- Vancouver Island Health

Best Practices for falls prevention in the home currently target:

- Stair gates
- Ban on baby walkers
- Window guards

Best Practices for falls prevention at the playground currently target:

- Impact-absorbing surfacing
- Removing swing sets

Home Safety - Suffocation, Burns & Poisoning

Child and youth suffocation injuries from 2003 to 2007 accounted for:

- 16 deaths (0.3/100,000)
- 218 hospitalizations (4.5/100,000)

Causes of suffocation injury included:

- Choking on inhaled food, vomit or other object
- Hanging/strangulation

Child and youth burn and scald injuries from 2003 to 2007 accounted for:

- 7 deaths (0.1/100,000)
- 479 hospitalizations (9.8/100,000)

Leading causes of burn injury included:

- Hot tap-water burns among ages 0-4 years

- Ignition of highly flammable materials/clothing among ages 10-14 and 15-19 years

Child and youth poisoning from 2003 to 2007 accounted for:

- 31 deaths (0.6/100,000)
- 1,067 hospitalizations (21.9/100,000)

Cause of poisoning hospitalization varied by age group. Among ages 0 to 4 years poisoning were from:

- Other/unspecified medication (29.6/100,000)
- Other/unspecified chemicals and noxious substances (9.8/100,000)
- Organic solvents, hydrocarbons and their vapours (4.1/100,000)

Among ages 5 to 9 years were poisonings from:

- Other/unspecified chemicals and noxious substances (2.5/100,000)
- Other/unspecified medication (1.9/100,000)
- Organic solvents, hydrocarbons and their vapours (1.1/100,000)

Among ages 10 to 14 years were poisonings from:

- Other/unspecified medication (4.8/100,000)
- Other/unspecified chemicals and noxious substances (2.1/100,000)
- Alcohol (1.8/100,000)

Among ages 15 to 19 years poisonings were from:

- Other/unspecified medication (15.4/100,000)
- Alcohol (4.4/100,000)
- Hallucinogens (3.2/100,000)

No significant trends were found for BC regarding hospitalization from suffocation or burn injuries. The rates of child and youth injury hospitalization from poisoning displayed a significant downward trend from 2003 to 2007 across BC.

Best Practices for home safety currently target education and training. Best Practices regarding suffocation target:

- Restricting food size
- Restricting foods with high elasticity or lubricity
- Safe sleep practices

Best Practices regarding fire, flames and hot substances currently target:

- Safe hot tap water temperatures
- Safe cooking environments
- Functioning smoke detectors/alarms
- Safe electrical wiring and usage
- Flame retardant sleepwear
- Community-based fire prevention interventions

Best Practices regarding unintentional poisoning currently target:

- Education
- Safe storage of medications
- Safe storage of poisonous materials
- Child resistant packaging

Sports & Recreation

Child and youth sports and recreation injuries from 2003 to 2007 accounted for:

- 5,644 injury hospitalizations (191.4/100,000 for boys; 45.0/100,000 for girls)

All ages combined, the leading Sport and Recreation activity leading to injury hospitalization was Ski/snowboard

- Boys (35.5/100,000)
- Girls (10.0/100,000)

Other leading activities resulting in sport and recreation injury included:

- Scooters (0 to 4 year olds)
- Skateboards (5-9 & 10-14 year olds)
- Hockey (15-19 year olds)

Leading types of injury resulting in hospitalization included:

- Fracture
- Intracranial
- Internal organ
- Sprain/strain
- Dislocation

Downward trends from 2003 to 2007 were significant for Fractures in:

- BC
- Fraser Health Authority
- Vancouver Island Health Authority

Best Practices regarding sports and recreation injury currently target:

- Correct instruction by coaches/teachers
- Use of appropriate sport-specific protective equipment, e.g. helmets, wrist guards, chest-protectors
- Stretch and strengthen to prevent injury

- Increased supervision
- Concussion awareness

Water Safety - Pools, Boating & Young Children

Child and youth drowning and near drowning incidents from 2003 to 2007 accounted for:

- 30 deaths (0.6/100,000)
- 107 hospitalizations (2.2/100,000)

Cause of near drowning varied by age group, including:

- Swimming Pool (all ages)
- Bathtub (0-4 years)
- Natural Water (10-14 & 15-19 years)

The rates of child and youth injury hospitalization from near drowning displayed a significant downward trend from 2003 to 2007 across BC.

Best Practices regarding pool safety currently target:

- 4-sided pool fencing
- Self-closing, self-latching gates
- Adult supervision
- CPR training

Best Practices regarding drowning prevention for younger children currently target:

- No unsupervised access to toilets
- No unsupervised shared bathing with older siblings
- Fencing around play areas close to rivers and lakes
- Water in pails or buckets

Best Practices regarding drowning prevention for older children currently target:

- Swimming lessons
- Education
- No alcohol use

Best Practices regarding drowning prevention in rural areas currently target:

- Barriers next to bodies of water (lakes, rivers, etc.) near residential areas
- Covers on wells
- First aid training in drowning for clinicians in villages
- CPR for local residents

Best Practices regarding the role of the health care provider in drowning prevention currently target:

- Providing education for patients
- Advocating for legislation

Self Harm & Assault

Child and youth self harm from 2003 to 2007 accounted for:

- 99 deaths (2.0/100,000)
- 2,669 hospitalizations (54.8/100,000)

Leading causes of self harm were:

- Self poisoning (47.4 per 100,000)
- Cutting/stabbing (5.3 per 100,000)

Vancouver Coastal Health Authority displayed a significant downward trend child and youth injury hospitalization from self harm between 2003 and 2007.

Best Practices regarding self harm currently include:

- Provision of depot flupenthixol and dialectical behaviour therapy

Best Practices regarding suicide prevention currently target:

- Prevention for high-risk groups: male, older, Aboriginal or white
- Screening students for mental health problems at school, with referrals to mental health professionals
- Teacher training to recognize depression and mental health disorders
- Passive community strategies (e.g. bridge safety barriers, detoxification of cooking gas and car exhaust, changes to packaging of analgesics)
- Media education regarding responsible reporting of suicides and provision of crisis hotlines
- Primary care physicians training to recognize, treat and refer patients
- Supervision of youth who have survived a suicide attempt
- Advocate to include mental health services in health insurance benefit packages

Child and youth assault from 2003 to 2007 accounted for:

- 40 deaths (0.8/100,000)
- 1,905 hospitalizations (39.1/100,000)

Leading cause of assault included:

- Maltreatment/neglect (0-4 & 5-9 year olds)
- Bodily force (10-14 & 15-19 year olds)

- Sharp/blunt objects (10-14 & 15-19 year olds)

BC and Interior Health Authority displayed significant downward trends for child and youth injury hospitalization from assault between 2003 and 2007.

Best Practices regarding assault prevention currently target:

- School-based programmes
- Home visitation by registered nurses
- Parental training programmes for treating child abuse and neglect
- Providing information, education, and counselling for Shaken Baby Syndrome

Opportunities for BC

The next steps for child and youth injury prevention in BC need to include a reinvestment in injury prevention in order to maintain the reductions in injury that have been demonstrated over the past several years. Opportunities are described for government to work in partnership with NGOs and others, and to provide leadership and coordination, are necessary to continue to reduce the burden of child and youth injuries in BC.



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INTRODUCTION

Injury is the leading cause of death among Canadian children and youth [1], and comprises a considerable proportion of hospital and emergency department visits [2, 3]. There are approximately 969,198 children and youth ages 0 to 19 years currently residing in British Columbia (BC). One child or youth is killed every three to four days and 18 are hospitalized daily due to injury. Unintentional injury is the leading cause of mortality and hospitalization among children in BC. Inflicted injury contributes 14 percent to the overall number of injuries. The prevalence of injury is unacceptable, particularly as the majority of injuries are preventable!

Children and youth deserve special attention as they are our future and deserve a healthy and safe environment. It is our collective responsibility to protect them from injury due to their vulnerability and the inability to anticipate potential hazards [4].

Purpose

The purpose of this report is to highlight the burden of injury among the children and youth of BC, provide the available evidence for prevention strategies, and comment on the implications for policy and practice. This report also celebrates the positive fact that the prevalence of injuries continues to decrease [1] as demonstrated in the previous report produced in 2005 [5].

Injuries among children and youth vary by ages and stages. Just as the nature and location of

injury vary with developmental stage [6, 7], the factors highlighted for prevention must vary accordingly. This report describes the unique patterns for cause and type of injury by age groups, as well as age-appropriate prevention measures.

Prevention Evidence

Effective injury prevention strategies incorporate the four E's: Education, Engineering/Environment, Enforcement, and Economic incentives [8]. Efforts have been made to capture these four E's in the evidence presented. The burden of injury illustrates that a gap remains between the evidence (what we know works) addressing childhood injury and the application (how to make it work) of evidence-based prevention activities in daily practice. Only current information published since 2005 with respect to data and prevention strategies is included.

Best Practices

Research has revealed that there are various effective strategies in preventing child and youth injury in general, including:

- Emergency department counselling [9]
- 'Teachable moments' for parents during medically attended injuries [10]
- Use of physician anticipatory guidance [11]
- Incorporating multiple interactive learning tools including group activities and rehearsal opportunities [12]

- Multi-disciplinary strategies including education, environmental modification or legislation [4]
- Environmental modification [3]
- Direct caregiver supervision of young children [13]

Emerging Strategies

- Use of collaborative research teams, including community partners such as teachers and parents [12]
- Comprehensive approaches integrating injury prevention into school curricula for young students [12]
- Computer kiosks providing tailored safety messages in emergency departments or other child care settings [14]
- Involving children and youth in prevention activities to enhance engagement and sense of control over their own behaviour [15]
- Increase in education strategies in lower SES communities [16]

Resources

Injury prevention resources are presented on pages 30 to 33, including international, national, provincial and specialized sources.



INJURY AMONG CHILDREN AND YOUTH IN BRITISH COLUMBIA - AN OVERVIEW

Key Findings

Injury is the leading cause of death among the children and youth of BC. Each year, an average of 104 children and youth ages 0 to 19 years died as a result of injury from 2003 to 2007, with a further 6,625 hospitalized.

Statistically significant differences were found between males and females for both mortality and hospital separation injury rates. Males continue to have significantly higher injury mortality and morbidity rates:

- Mortality: $X^2=74.44$, *p-value*: 0000
- Morbidity: $X^2=2650.15$, *p-value*: 000

Injury Mortality

The overall injury mortality rate among children and youth ages 0 to 19 years in BC from 2003 to 2007 was 10.7 per 100,000 population. Rates were highest among male youth ages 15 to 19 years.

Child & Youth Injury Mortality Rates per 100,000 by Age Group (years) and Sex, BC, 2003-2007			
	Male	Female	All
0-4	5.0	3.0	4.1
5-9	2.9	1.8	2.4
10-14	5.8	3.8	4.8
15-19	39.2	15.5	27.8
All Ages	14.6	6.5	10.7

Injury Hospitalization

The overall injury hospitalization rate among children and youth ages 0 to 19 years in BC from 2003 to 2007 was 679.7 per 100,000 population.

Similar to mortality, rates were almost twice as high among males as among females; highest among youth ages 15 to 19 years.

Child & Youth Injury Hospitalization Rates per 100,000 by Age Group (years) and Sex, BC, 2003-2007			
	Male	Female	All
0-4	481.6	399.4	441.8
5-9	510.2	382.5	448.2
10-14	861.0	418.5	646.4
15-19	1436.4	683.6	1074.7
All Ages	865.1	481.7	679.7

Causes of Injury

Leading causes of injury resulting in death among children and youth in BC from 2003 to 2007 included Drowning, Motor Vehicle Crash, Suffocation, Suicide and Homicide. Rankings by age groups indicate Motor Vehicle Crash to be

Leading Causes of Child & Youth Injury Mortality (rates per 100,000) by Age Group (years), BC, 2003-2007				
	0-4	5-9	10-14	15-19
Drowning	1.3			
Motor Vehicle Crash*	1.2	1.7	2.8	15.3
Suffocation	0.9			
Suicide			0.8	6.6
Homicide		0.3		

*Any collision or non-collision involving one or more motor vehicle designed primarily for transportation on the road. Includes motor vehicle occupant, pedestrian, motorcycle and pedal-cycle.

the leading cause for ages 5 to 19 years, while very young children are at higher risk of Drowning.

Falls were the leading cause of injury resulting in hospitalization in BC from 2003 to 2007 among all ages of children and youth. Struck by Object, often associated with sport and recreation activities, was the second leading cause among ages 5 to 19 years, while Foreign Body was the second leading cause among very young children. Other leading causes included Poisoning; Fire, Flames and Hot Substances; Motor Vehicle Crashes; Bicycle Injuries not involving motorized traffic; Attempted Suicide; and Assault.

Leading Causes of Child and Youth Injury Hospitalization (rates per 100,000) by Age Group (years), BC, 2003-2007				
	0-4	5-9	10-14	15-19
Falls	182.5	258.5	240.3	186.9
Foreign Body	62.5	24.6		
Poisoning	47.1			
Fire, Flames & Hot Substances	22.6			
Struck by Object	22.5	36.9	106.8	164.3
Motor Vehicle Crash*		30.3	50.1	155.73
Non-MV Pedal Cycle		31.8	67.8	
Attempted Suicide			35.4	157.3
Assault				113.9

*Any collision or non-collision involving one or more motor vehicle designed primarily for transportation on the road. Includes motor vehicle occupant, pedestrian, motorcycle and pedal-cycle.

Types of Injuries

Asphyxia/strangulation was the leading type of injury leading to death among children and youth in BC from 2003 to 2007, accounting for 17 percent of all cases. Drowning/immersion and Poisoning/toxic effect each accounted for 10 percent.

Leading Types of Child & Youth Injury Mortality (rates per 100,000) by Sex, BC, 2003-2007			
	Male	Female	Total
Asphyxial/strangulation	2.3	1.2	1.8
Drowning/immersion	1.4	0.7	1.1
Poisoning/toxic effects	1.1	1.1	1.1

Fracture was the leading type of injury resulting in hospitalization among all children and youth in BC from 2003 to 2007. The second leading types of injury by age group were:

- 0 to 4 years – Foreign Body
- 5 to 14 years – Intracranial Injury
- 15 to 19 years – Poisoning and Toxic Effects

Leading Type of Child and Youth Injury Hospitalization (rates per 100,000) by Age Group (years), BC, 2003-2007				
	0-4	5-9	10-14	15-19
Fractures	149.08	298.35	407.75	508.14
Foreign body	74.35	26.56		
Poisoning/Toxic	44.61		40.28	160.88
Intracranial Injury	44.32	29.73	48.90	68.08
Open Wound	25.88	25.86	24.60	50.08
Internal Organ		9.94	22.99	51.01

Leading Types of Child & Youth Injury Hospitalization (rates per 100,000) by Sex, BC, 2003-2007			
	Males	Females	Total
Fracture	489.27	213.81	356.09
Poisoning/toxic effects	42.55	94.81	67.82
Intracranial Injury	68.02	28.60	48.96
Open Wound	38.86	25.68	32.48

Among males, Fracture accounted for 54 percent of injury hospitalizations followed by:

- Intracranial Injury – 8%
- Poisoning and Toxic Effects – 5%
- Open Wound -- 4%
- Internal Organ Injury -- 4%

Among females, Fracture accounted for 43 percent of injury hospitalizations followed by:

- Poisoning and Toxic Effects -- 19%
- Intracranial Injury -- 6%
- Open Wound -- 5%
- Foreign Body -- 5%

Cost of Injury

Societal costs of injury include both direct and indirect costs. Direct costs are those relating to health care costs arising from the injury events, while the indirect costs are those related to reduced productivity accounted for by hospitalization, disability, and premature death [1].

Total cost of child and youth injury in BC based on 2004 data is estimated to be \$802,596,128

Direct costs– \$438,067,526
Indirect costs– \$364,528,602



Beyond the direct and indirect costs of injury, the intangible costs of injury are well known among the families and communities of injured children and youth. These intangible costs can include:

- Pain and suffering
- Economic dependence
- Social isolation
- Depression

“Too many Canadians have their lives and those of their families irrevocably changed forever as a result of injury.”

SMARTRISK, 2009 [1].

Injury Time Trends

Injury hospitalization rates among children and youth in BC are on the decline across all age groups, as demonstrated by the five-year time trends from 2003 to 2007.

Among 0 to 4 year olds, injury hospitalization rates between 2003 and 2007 declined from 468.7 to 414.8 per 100,000 population (males: 521.2 to 447.5/100,000; females: 413.0 to 379.8/100,000).

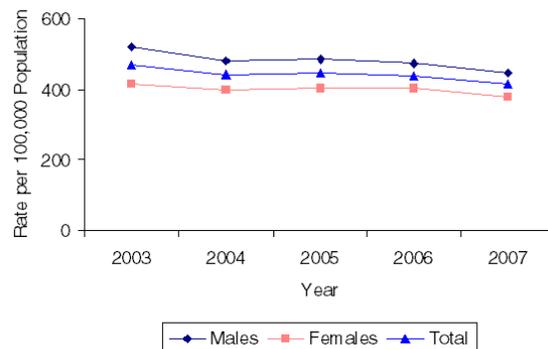
Among 5 to 9 year olds, injury hospitalization rates between 2003 and 2007 declined from 468.6 to 387.8 per 100,000 population (males: 532.6 to 464.0/100,000; females: 400.8 to 306.7/100,000).

Among 10 to 14 year olds injury hospitalization rates between 2003 and 2007 declined from 711.5 to 593.2 per 100,000 population (males: 940.2 to 801.3/100,000; females: 468.3 to 372.1/100,000).

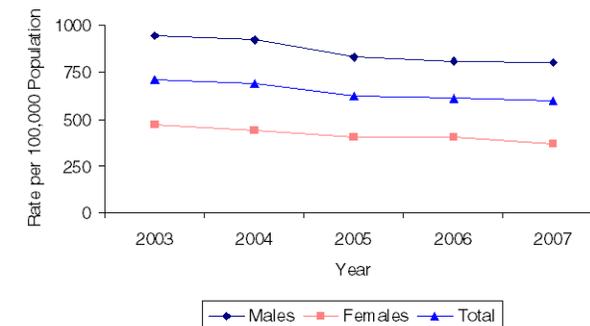
Among 15 to 19 year olds, injury hospitalization rates between 2003 and 2007 declined from 1,156.6 to 1,029.4 per 100,000 population (males: 1,518.6 to 1,385.7/100,000; females: 768.8 to 644.0/100,000).

The greatest downward trends were seen among 5 to 9 year old females and 10 to 14 year old males. All the downward trends were statistically significant ($p < 0.05$) except for among females ages 0 to 4 years.

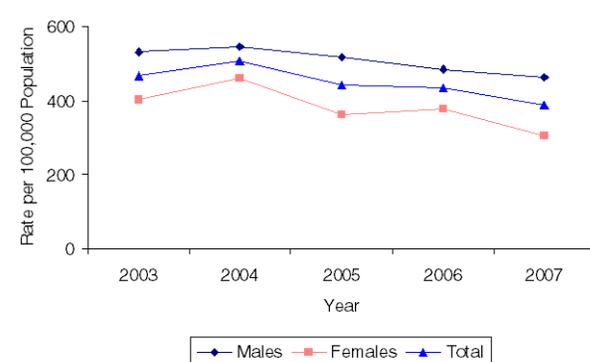
Rates of Child and Youth Injury Hospitalization by Sex, Ages 0-4 years, BC, 2003-2007.



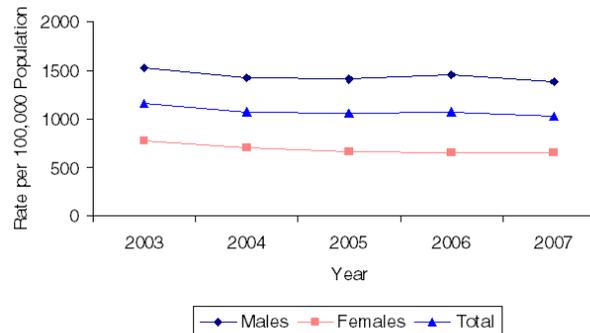
Rates of Child and Youth Injury Hospitalization by Sex, Ages 10-14 years, BC, 2003-2007.



Rates of Child and Youth Injury Hospitalization by Sex, Ages 5-9 years, BC, 2003-2007.



Rates of Child and Youth Injury Hospitalization by Sex, Ages 15-19 years, BC, 2003-2007.



Injury in Health Authorities

The BC provincial age standardized child and youth injury mortality rate from 2003 to 2007 is 6.8 per 100,000 population. In descending order, the rates broken down by location by the BC Health Authority are:

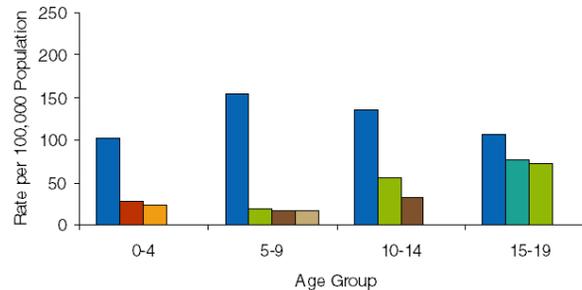
- Northern: 12.6 per 100,000
- Interior: 9.1 per 100,000
- Vancouver Island: 8.2 per 100,000
- Fraser: 5.7 per 100,000
- Vancouver Coastal: 3.9 per 100,000

The BC provincial age standardized child and youth injury hospitalization rate from 2003 to 2007 is 518.7 per 100,000 population. In descending order, the rates broken down by location by the BC Health Authority are:

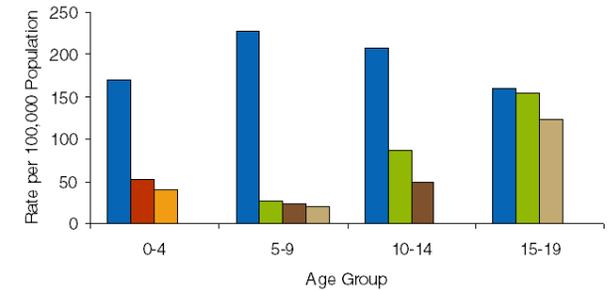
- Northern: 766.9 per 100,000
- Interior: 588.7 per 100,000
- Vancouver Island 539.9 per 100,000
- Fraser: 381.1 per 100,000
- Vancouver Coastal: 326.9 per 100,000

The leading cause of injury hospitalization across regions and age groups was Falls. Foreign Body and Unintentional Poisoning were leading causes among 0 to 4 years olds, not appearing for the other ages. Struck by Object appears among the older age groups — likely in regards to sports injury — as well as Bicycle Injuries, Motor Vehicle Cashes, and Suicide Attempts.

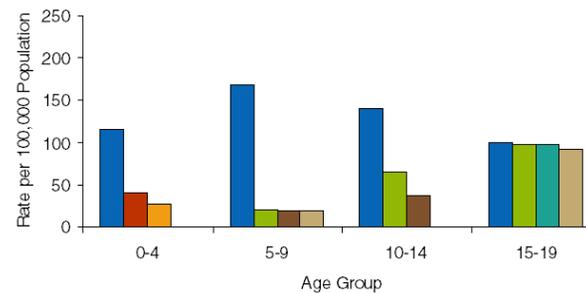
Rates of Leading Causes of Child and Youth Injury Hospitalization by Age Group (years), Vancouver Coastal Health Authority, 2003-2007.



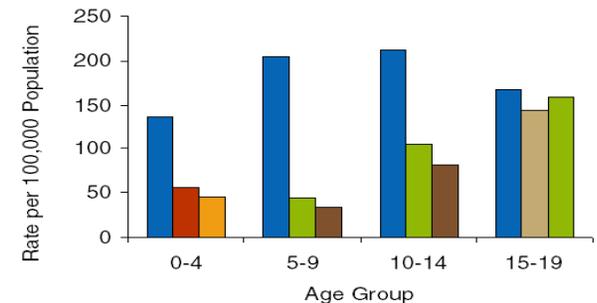
Rates of Leading Causes of Child and Youth Injury Hospitalization by Age Group (years), Vancouver Island Health Authority, 2003-2007.



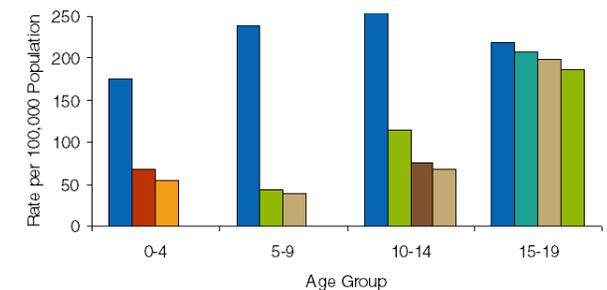
Rates of Leading Causes of Child and Youth Injury Hospitalization by Age Group (years), Fraser Health Authority, 2003-2007.



Rates of Leading Causes of Child and Youth Injury Hospitalization by Age Group (years), Interior Health Authority, 2003-2007.



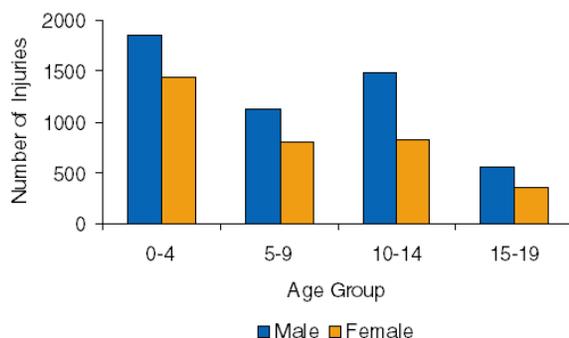
Rates of Leading Causes of Child and Youth Injury Hospitalization by Age Group (years), Northern Health Authority, 2003-2007.



BC CHILDREN'S HOSPITAL EMERGENCY DEPARTMENT

There were 8,439 injury cases seen at BC Children's Hospital Emergency Department in 2007, as captured by the Children Hospital Injury Reporting and Prevention Program (CHIRPP). Of these, 60 percent were males, and 39 percent were among 0 to 4 year olds. The most common types of injury were Fractures (23%), Superficial (17%) and Open Wound (17%).

Number of Injuries by Age Group and Sex, CHIRPP, BC Children's Hospital, 2007.



Among ages 0 to 4 years, injuries were sustained to the Head (22%), Face (20%) and Elbow (15%), with similar proportions among ages 5 to 9 (Head -16%, Face-14% and Elbow-10%). Ages 10 to 14 years sustained injuries primarily to the Wrist (11%), Finger/thumb (11%) and Head (10%); while ages 15 to 19 sustained Systemic (17%), Ankle (12%) and Head (9%) injuries.

Activity when injured varied by age group. Playing, Climbing and Dancing (at home) was leading for ages 0 to 4 (48%) and 5 to 9 (46%);

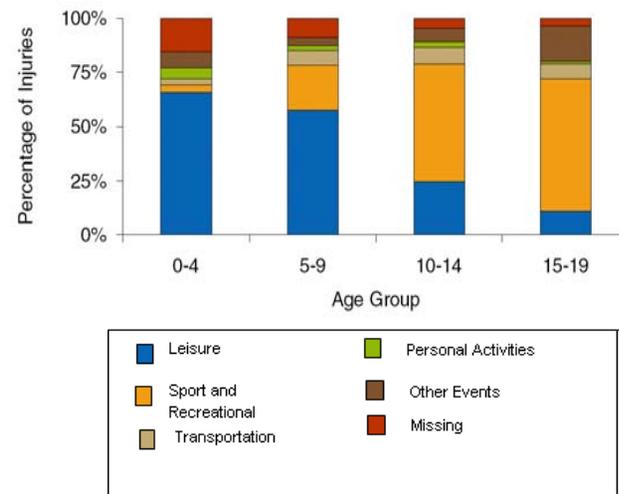
followed by Walking, Running and Crawling for ages 0 to 4 (19%), and Informal Sports and Recreation Activities for 5 to 9 (13%). Organized Sports Competition and Practice was leading for ages 10 to 14 (27%) and 15 to 19 years (31%); followed by Informal Sports and Recreation Activities (21% and 14% respectively). Context was missing in 10 percent of cases.

Common place of occurrence for injury events among ages 0 to 4 years were Living Rooms (26%) and Bedrooms (21%); ages 5 to 9 were more likely in Playgrounds (29%); and ages 10 to 14 and 15 to 19 were in Sports Fields (14% and 25% respectively). Place was unknown for 45 percent of cases.

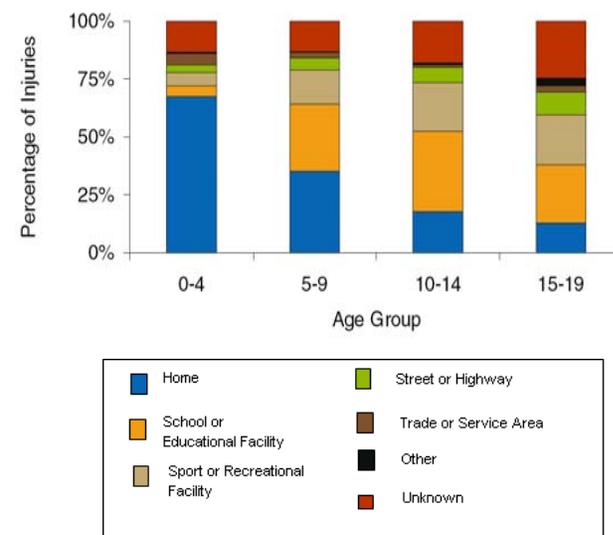
Beds (14%), Other furniture (11%) and Tables and Chairs (10%) were involved in injury events among 0 to 4 year olds. Playground (22%) and Physical Activities and Equipment (15%) were involved in injuries among 5 to 9 year olds. Team Sports were involved in injury events among 10 to 14 (33%) and 15 to 19 year olds (43%); followed by Physical Activities and Equipment (18%) for the younger group, and Team Sports (15%) and Other Person (15%) for the older group. Context was unknown or missing for 41 percent of cases.

Injuries seen at BC Children's Emergency Department occurred primarily between 4 and 7 pm (33%) and 12 and 3 pm (30%). Time of day was missing for 18 percent of cases.

Number of Injuries by Age Group and Activity when Injured, CHIRPP, BC Children's Hospital, 2007.



Number of Injuries by Age Group and Location of Injury, CHIRPP, BC Children's Hospital, 2007.



INJURY PREVENTION IN BC

BC has continued to implement a strategic and collaborative approach to reducing the incidence and severity of injuries among children and youth. Injury mortality and hospitalization rates resulting from preventable injuries are demonstrating positive downward trends. These successes are the result of an integrated approach focusing on education, social marketing initiatives, policy, research and practice by the BC Government and the many partners engaged in injury prevention. Initiatives that have contributed towards this decline include:

- BCAA Traffic Safety Foundation road safety initiatives such as Boost BC, School Safety Patrol Programs and Child Passenger Safety Programs. The Boost BC program and the implementation of the Booster Seat Legislation in BC, in July 2008, led to a 16 percent increase in booster seat use from 2007 to 2008.
- The Community Against Preventable Injuries – *preventable.ca* campaign – uses innovative strategies such as social media to reach and influence the attitudes and behaviours of parents and caregivers around preventable injuries. The *Wipeout* documentary on extreme sports is an awareness tool for parents and young teens that has demonstrated great impact.
- The Period of PURPLE Crying, implemented in BC by researchers, practitioners and policy makers in 2008, educates caregivers on the prevention of shaken baby syndrome and the norms of infant crying.

- Safe Kids Canada, a national knowledge broker, translates research into best practices. Activities such as *Safe Kids Week* educate parents on the major causes of childhood injury and death, and available preventive measures.
- Brain Trust Canada’s social marketing campaign – *Protect Your Head* – influences teenagers’ decision making behavior around injury risks and prevention.
- Think First Canada’s evidence-based interactive program, motivating children to wear seatbelts, helmets, and safety gear to prevent brain and spinal cord injuries.
- The Canadian Child and Youth Injury Indicator Development Team has identified a set of 34 indicators to measure and track the burden of injury among Canadian children and youth, including indicators related to injury outcome, risk and policy. A parallel set of 27 indicators for First Nations and Inuit children and youth has also been specified.
- Co-ordinated by the Office of the Provincial Health Officer, British Columbia has the goal to identify a suite of indicators that will assist the Provincial Health Officer and the BC Government to report on meaningful and malleable factors that affect the health and well-being of BC’s children, including injury. It is hoped that this process will enable multiple Ministries to take action on issues under their domain, and also influence the national development of indicators of the health and well-being of children across Canada.

- First Nations Health Council is implementing prevention programs to reduce injury among First Nations: Tripartite partners’ collaboration with BCAA Traffic Safety Foundation to develop practical tools and tips to help families and communities be safer on our roads; Collaboration with the Red Cross to make water safety resources available to students.
- Aboriginal Health Branch, guided by the Tripartite First Nations Health Plan, is working collaboratively with First Nations Health Council and First Nations and Inuit Health Branch (Health Canada) to address gaps in health between First Nations and other BC residents. The goal is to improve the health and well being of the First Nations through partnerships, longer-term commitments and greater inclusiveness of the community.

Despite significant investment and commitment by many organizations, injury remains the leading cause of death for British Columbians ages 1 to 34 years, and is still one of the largest cost contributors to our health care system. More children die from injuries than all other causes and Canada ranks 22nd among the 29 OECD countries when it comes to preventable childhood injuries and death.

The BC Injury Research and Prevention Unit serves as a provincial hub for injury prevention, and works in collaboration with Federal, Provincial and regional stakeholders. Through these strategic partnerships and collaborative action, BC aims to reduce preventable injuries among child and youth.

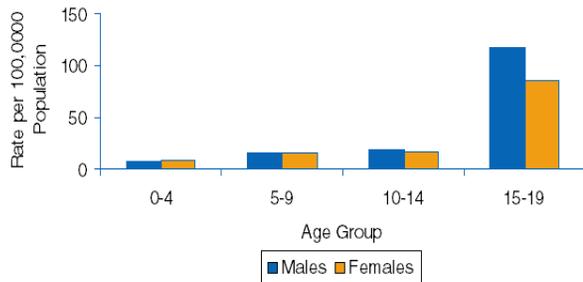
OCCUPANT SAFETY AND MOTOR VEHICLE CRASHES

The Facts

Occupants in motor vehicle crashes accounted for 200 deaths among BC children and youth from 2003 to 2007, with a rate of 4.1 per 100,000. The majority (165) of these deaths were among 15 to 19 year olds. There were a total of 43 occupant deaths that resulted due to alcohol involvement. Of these, 41 deaths were among 15-19 year olds.

There were 1,904 motor vehicle occupant injury hospitalizations among BC's children and youth from 2003-2007, with a rate of 39.1 per 100,000. Boys accounted for 57.7 percent of these. Rates were 43.7 per 100,000 for boys and 34.2 per 100,000 for girls.

Rates of Child and Youth Motor Vehicle Crash Injury Hospitalization, by Age Group (years) and Sex, BC, 2003-2007.



Types of motor vehicle occupant injury resulting in hospitalizations included: fracture; intracranial; internal organ; open wound; and superficial injury.

CHIRPP Vignettes

A 3 year old girl sustained systemic injuries when and she fell forward and ended up upside down in her improperly installed carseat as her parent slammed on the brakes.

An 8 year old boy sustained systemic injuries from a head-on car collision travelling at 40km/h. He was not using a shoulder belt.

An 11 year old girl sustained a head injury as well as injuries to the face and abdomen when a truck veered into her car head on. The girl's face hit the back of the seat.

A 15 year old boy was a passenger in a car that was rear-ended, pushed into the intersection and then t-boned by a pickup truck. He sustained multiple injuries including his clavicle and thorax.

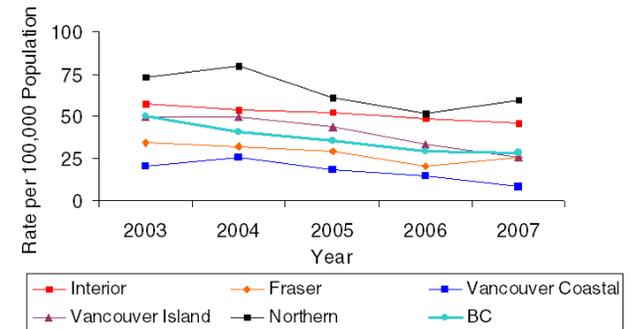
A 16 year old male passenger was ejected, found in a ditch and sustained liver and spleen lacerations from a single vehicle collision.



Trends

The rates of child and youth motor vehicle occupant injury hospitalization across the five BC Health Authorities display downward trends from 2003 to 2007. Trends were statistically significant for BC, Vancouver Island and Interior Health Authorities at p<0.05.

Age Standardized Rates of Child and Youth Motor Vehicle Crash Injury Hospitalization by Health Authority, BC, 2003-2007.



Prevention Evidence

Best Practices

- Children should be seated in age-appropriate restraints [1, 2]
- The rear seat or the rear centre seat is the safest position for a child [1, 3-7]
- **Emerging Strategies**
- Educating beyond mothers to husbands, grandparents and additional family members about consistent child restraint use [8]
- Manufacturers including upper end of the height range, rather than weight alone, this is

relevant to positioning of the seat belt on pelvis and shoulder [9]

CHILD RESTRAINT SEATS (CRS)

Best Practices

CRS are legislated across Canada for children ages 0 to 4 years.

- CRS should be rear-facing for children under 2 years of age [10, 11]

Emerging Strategies

- Training with child passenger safety certified personnel [12]
- Hands-on CRS safety checks or inspection stations [12-14]
- Increased media attention to promote parents attending CRS safety check/inspection stations [12]
- Law enforcement agencies taking active roles in community CRS education programs to emphasize enforcement [12]
- Educational campaigns, anticipatory guidance, and legislative interventions [1]
- Clinicians, pediatricians and child passenger advocacy groups emphasizing the use of rear-facing seats beyond the first year [11]
- Messages that shock parents into paying attention, increase perceptions of vulnerability and risk as well as instil a sense of efficacy for protecting their child if by using a CRS [15]

LATCH SYSTEMS

LATCH systems – Lower Anchors and Tethers for Children – are an effective means of securing CRS into vehicles, although misuse of the system can occur due to loose harnesses. [16] The rigid ISOFIX system appears to effectively address this issue. [17]

Emerging Strategies

- Use of a rigid LATCH system with no tightening necessary [16]
- Use of two individual LATCH webbing straps attached to each side of the CRS rather than one continuous loop, to limit routing misuse [16]

BOOSTER SEATS

Best Practices

Booster seats are recommended for children ages 4 to 8 years, and are legislated in several provinces. Strategies to promote proper use include:

- Promotion campaigns [18]
- Incentives (discount coupons/gift certificates) combined with education [18, 19]
- Distribution of free booster seats combined with education [18]
- Primary enforcement [7, 19]
- Belt-positioning booster seats with integrated guides provide better belt fit of lap and shoulder belts [20]

Emerging Strategies

- Modelling promotion efforts on those successful for seat belt use: legislation, strong enforcement, advertising, community-based programs [21]
- Informing parents/caregivers of booster seat legislation and information through television [22]
- Community-based programs [7, 23, 24]
- “Boost ‘em in the Back Seat Program” – high-threat messaging is promising [25]

SEAT BELTS

The “tweens” ages 8 to 12 years tend to transition from booster seats to seat belts, but proper fit may be an issue. Children may either not use the shoulder belt or place it behind their back or under their arm.

Best Practices

- Use of lap and shoulder belts provide the best protection against injury [26]
- Requirements for proper seat belt protection are: sitting all the way back against the seat, knees bent comfortably, seat belt crossing the shoulder between the neck and arm, lap portion of the seat belt as low as possible touching the thighs [27]

PASSENGER AIRBAGS

Although airbags prevent injury among adults, their deployment is dangerous for children.

PRIMARY ENFORCEMENT LAWS

Best Practices

- Primary enforcement of laws is more effective for injury prevention than secondary enforcement laws [28]

Emerging Strategies

Interventions should focus on older child passengers with respect to seat belt and proper restraint use [28]

TYPE OF VEHICLE

Emerging Strategy

- There may be a reduced risk of non-fatal injuries for child passengers in minivans as opposed to SUVs [29]

YOUNG DRIVERS

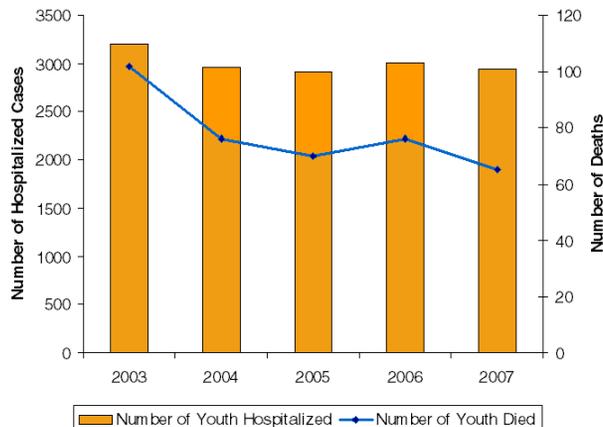
Trends

The Insurance Corporation of BC (ICBC) reports that youth drivers between the ages of 16 and 21 years have twice the number of crashes as those 22 years and older; and that these youth drivers account for eight percent of the driving population in BC, yet they are involved in 18 percent of all fatal collisions [1]. Contributing factors to these crashes are listed as:

- Driver inexperience
- Driving without due care
- Overestimation of ability
- Thrill seeking
- Risk-taking

Unsafe speed and alcohol are currently considered the leading contributing factors for fatal crashes involving youth drivers, accounting for 26 percent of all speed-related and 19 percent of all alcohol-impaired crashes resulting in injury or fatality [1].

Number of Motor Vehicle Crash Related Hospitalizations and Deaths among Youth (15-19 years), BC, 2003-2007.



Prevention Evidence

Research examining the prevention of motor vehicle crashes is abundant. Several key prevention areas have proven effective.

Best Practices

To prevent motor vehicle crashes in general, recommended strategies include:

- Speed enforcement detection devices [2]
- Speed cushions to reduce vehicle speed; the distance from the speed cushion to the marked pedestrian crosswalk should be approximately 2 car lengths [3]
- Stop lines marked at non-signalized pedestrian crosswalks; stop lines should be striped a short distance ahead of the crosswalk for increased visibility [3]

IMPAIRED DRIVING/ALCOHOL MISUSE

Best Practices

- Designated driver programs [4]
- Safe ride home programs [4]
- Alcohol ignition interlock programmes have proven effective in preventing injuries [5]

Emerging Strategies

- Programs such as the Strengthening Families Program—a prevention program involving the whole family combining parent, children's and family skills training. Effectiveness increases over time, reflecting a developmentally oriented intervention [6, 7]
- Culturally focused skills training related to impaired driving and alcohol misuse [6]

TEENAGERS

Best Practices

- Graduated driver licensing (GDL) [8]

CHIRPP Vignettes

An 18 year old male driving a car 200 km/h when he slid off the wet road, flipped several times and hit a pole and a tree.

An 18 year old female was on her way home from a party with a friend – a drunk driver. The car was t-boned, and she was ejected and sustained a spinal injury (C6-7 wedge compression).

A 19 year old female was driving when her car was rear-ended. She sustained injuries to her lower back and neck.

- Night-time and passenger restrictions [8]
- Driver education [8]
- Alcohol-related measures [8]
- Improved safety belt laws [8]
- Parental interventions [8]
- No distractions such as cell phones, in-vehicle devices or other passengers [9]
- In rural areas, interventions that focus on reducing single vehicle crashes and key issues such as speeding and road geometry [10]

Emerging Strategies

- Anticipatory guidance by pediatricians [8]
- Community advocacy by pediatricians [8]
- Legislative advocacy by pediatricians [8]
- Involvement of alcoholic beverage and entertainment industries in encouraging responsible behaviour [9]

GRADUATED DRIVER LICENSING (GDL)

Best Practices

The efficacy of GDL in reducing injury has been demonstrated for many years, yet the magnitude of the effect of GDL remains unclear [11].

Newer strategies that streamline the parameters have been examined, including:

- Age requirements and at least 3 months of waiting prior to the intermediate stage [11, 12]
- Night-time driving restriction, passenger restriction, and at least 30 hours of supervised driving [11, 12]
- A minimum of five of the seven possible components—minimum age for learner permit; mandatory waiting period; minimum 30 hours of supervised driving; minimum age for full licensing; night-time restriction; passenger restriction [11, 12]
- Increased night restriction in the learner stage, driver education in the learner and intermediate stages, passenger restriction in the intermediate stage, exit test in the intermediate stage [13]

Emerging Strategies

- Raising the licensing age [12]
- Increasing the length of the low-risk supervised learner period [12]
- Reducing high-risk driving after initial licensure [12, 14]
- Passenger restrictions not be waived unless there the passenger is 30+ years of age [12]
- Pediatricians and general practitioners encouraging parents to help enforce GDL requirements and working with legislators to create comprehensive GDL programs [12]

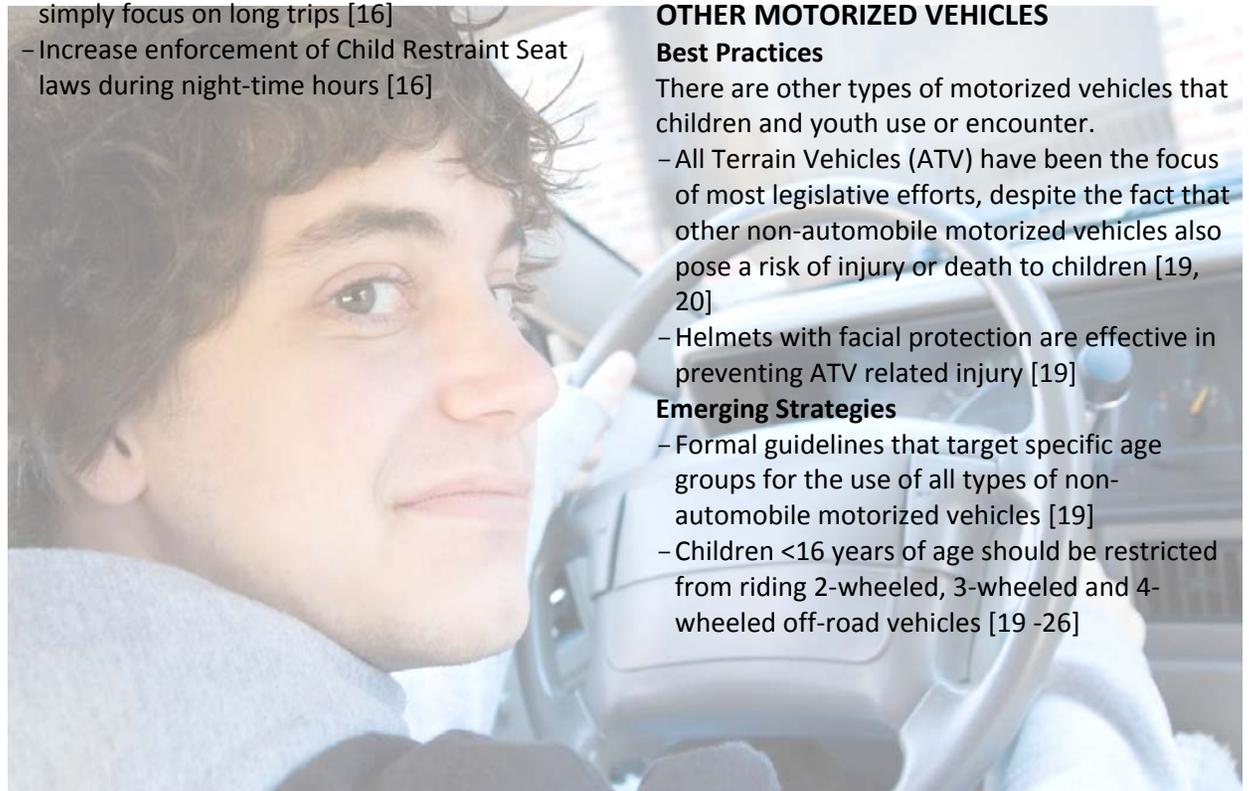
TEEN DRIVERS AND CHILD OCCUPANTS

Best Practices

Teen drivers may not only be an injury risk to themselves, but also to child occupants. In vehicles driven by teens, a high rate of inappropriate restraint for 4-8 year olds, and

front row seating for children under the age of 13 was found to be more common than for adult drivers [15]. Some GDL programs allow exemptions to the teen passenger restriction if the passenger is a family member. There are obvious practical needs for this exemption.

- Additional education in GDL programs regarding child passenger safety is recommended to be included [15]
- Frame messages in a meaningful way that apply to parents and caregivers so they will be more likely to respond [16]
- Educational messages should emphasize the crash risk for everyday trips as well, and not simply focus on long trips [16]
- Increase enforcement of Child Restraint Seat laws during night-time hours [16]



MOTORCYCLES

Best Practices

Motorcycles are another mode of transport for youth over the age of 16, who may incur injury.

- Motorcycle helmets are effective in reducing motorcycle-related deaths and head/neck/brain injuries [17]

Emerging Strategies

- Helmets should be discarded after a crash or after three to five years [18]
- White or light-coloured helmets should be worn instead of black or dark-coloured to increase visibility [18]

OTHER MOTORIZED VEHICLES

Best Practices

There are other types of motorized vehicles that children and youth use or encounter.

- All Terrain Vehicles (ATV) have been the focus of most legislative efforts, despite the fact that other non-automobile motorized vehicles also pose a risk of injury or death to children [19, 20]
- Helmets with facial protection are effective in preventing ATV related injury [19]

Emerging Strategies

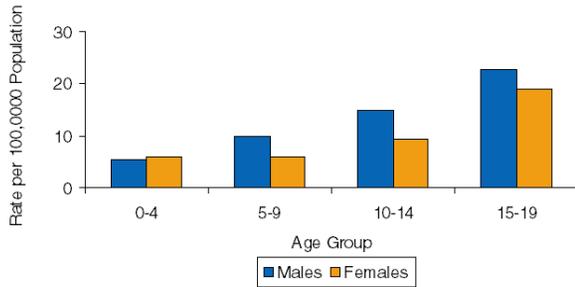
- Formal guidelines that target specific age groups for the use of all types of non-automobile motorized vehicles [19]
- Children <16 years of age should be restricted from riding 2-wheeled, 3-wheeled and 4-wheeled off-road vehicles [19 -26]

ROAD SAFETY - PEDESTRIANS AND CYCLISTS

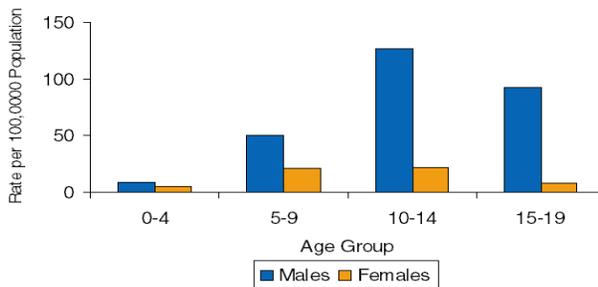
The Facts

Pedestrian injuries resulting from crashes with motor vehicles accounted for 36 deaths among BC children and youth from 2003 to 2007, for a rate of 0.7 per 100,000. Nearly half of these deaths (17) were among 15 to 19 year olds.

Rates of Child and Youth Pedestrian Injury Hospitalization, by Age Group (years) and Sex, BC, 2003-2007.



Rates of Child and Youth Cyclist Injury Hospitalization, by Age Group (years) and Sex, BC, 2003-2007.



There were 603 pedestrian injury hospitalizations among children and youth in BC from 2003 to 2007, with a rate of 12.3 per 100,000. Boys accounted for 58.5 percent of these. Rates were

14.0 per 100,000 for boys and 10.6 per 100,000 for girls. The most common types of pedestrian injury resulting in hospitalizations included fracture and intracranial injury.

There were 14 cycling deaths among BC children and youth from 2003 to 2007 resulting from both crashes with motor vehicles and non-motor vehicle crashes, for a rate of 0.3 per 100,000. The majority (8) of these deaths were among 15 to 19 year olds.

Cycling injuries accounted for 2,201 cyclist injury hospitalizations among BC's children and youth from 2003 to 2007, with a rate of 45.2 per 100,000; 74.2 per 100,000 for boys and 14.1 per 100,000 for girls. Boys accounted for 84.9 percent of all cycling related hospitalizations. Types of injury sustained by cyclists included fracture, intracranial, internal organ, open wound and superficial injuries.

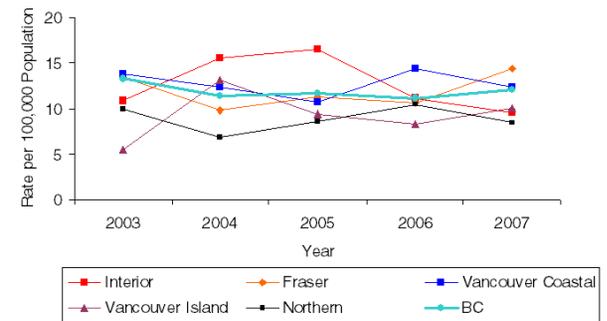
Trends

Age-standardized rates of child and youth pedestrian injury hospitalization display downward trends from 2003 to 2007 for Interior, Northern and Vancouver Coastal Health Authorities. Slight upward trends are found for Fraser and Vancouver Island Health Authorities, none of the trends were found to be statistically significant.

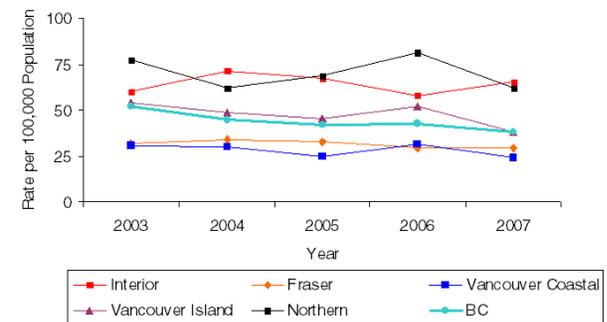
Age-standardized rates of child and youth cyclist injury hospitalization display downward trends from 2003 to 2007 across four BC Health

Authorities, with the exception of Interior. Only the BC provincial downward trend was found to be statistically significant at $p < 0.05$.

Age Standardized Rates of Child and Youth Pedestrian Injury Hospitalization by Health Authority, BC, 2003-2007.



Age Standardized Rates of Child and Youth Cyclist Injury Hospitalization by Health Authority, BC, 2003-2007.



Prevention Evidence

PEDESTRIAN SAFETY

Best Practices

- Pedestrian safety education [1]
- Traffic calming strategies [2]
- Provide parents with guidelines to accurately appraise their child's readiness for crossing streets independently and information about best practices for teaching children how to cross safely [3]
- Interventions focused around schools [4]

Several recommendations have been proposed for pedestrian/cyclist visibility, including:

Best Practices

- Use of visibility aids influence drivers' reaction, detection and recognition [5]
- Fluorescent materials in yellow, red, and orange improve detection and recognition in daylight hours (yellow is the most effective non-fluorescent colour) [5]
- Lamps, flashing lights, and retro-reflective materials in red and yellow enhance detection and recognition at night time hours and biomotion markings improve recognition [5]
- Use of visibility aids made with a combination of fluorescent and retro-reflective materials would be ideal since they are effective in day and night hours [5]
- User acceptability may increase if detachable tags, strips or vests are available [5]

CYCLISTS

Best Practices

The bicycle is both a child's form of transportation and is used for play. Evidence suggests that:

- Children should start cycling at the age of 7 or 8, rather than 4 or 5, to reduce their risk of getting injured [6]
- Bicycle helmets are effective in preventing injury to the head and face [7, 8]

Emerging Strategies

- Bicycle helmets with chin protection should be developed to prevent injury to the lower face and jaw [7]

Bicycle helmet legislation

Best Practices

- There is much research surrounding bicycle helmets and the evidence-based efficacy of bicycle helmet legislation. [9, 10] In BC, it is mandatory to wear a helmet while cycling for all ages.
- Bicycle helmet legislation for those under 18 years of age is effective in preventing injury [11]
- Research suggests that there should be enforced helmet legislation for all ages [8, 11]

Emerging Strategies

- Enforcement of bicycle helmet laws and continued provincial wide media campaigns are required to sustain helmet use [12]

Non-legislative strategies to increase helmet use

Best Practices

Evidence suggests that the following strategies are effective:

- Community-based programmes and interventions [8, 13, 14, 15, 16]

- Provision of free helmets or subsidized helmets [8, 13, 14, 15, 16]
- Provision of free helmet and fitting with each purchase of a bicycle [8, 13, 14, 15, 16]
- In-school interventions [8, 13, 14, 15, 16]
- Seizure of bicycles of cyclists not wearing helmets [8, 13, 14, 15, 16]
- Combinations of these initiatives [8, 13, 14, 15, 16]

Emerging Strategies

- Consider children's attitudes toward helmets and helmet-wearing when designing promotional campaigns [17]
- Ensure that high-quality helmets are accessible and affordable [8]

Peer and adult companion helmet use

Best Practice

- Children are more likely to wear a helmet if they are accompanied by someone who is also wearing a helmet [13, 18]

Road environment

Best Practices

Safety of the road environment is fundamental in preventing bicycle-related injury. Strategies include the provision of:

- Bicycle paths and lanes [8]
- Bicycle traffic lights [8]
- Bicycle crossings [8]

CHIRPP Vignettes

An 18 year old was crossing the street listening to his ipod, when he was struck by a car. He hit the windshield and was thrown 20 feet onto concrete. He sustained a head injury and injuries to his lower body.

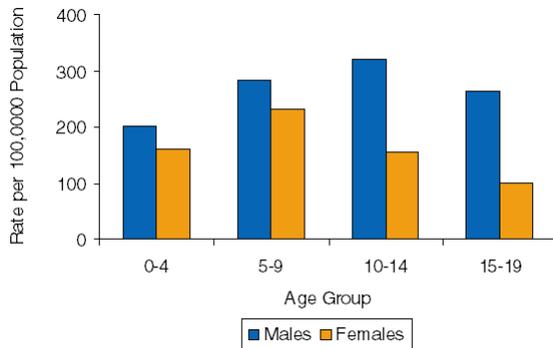
FALLS - AT HOME AND PLAY

The Facts

Falls accounted for 14 deaths among BC children and youth from 2003 to 2007, for a rate of 0.3 per 100,000. The majority (9) of these deaths were among 15 to 19 year olds.

A total of 10, 571 falls injury hospitalizations occurred among BC's children and youth from 2003 to 2007, with a rate of 216.9 per 100,000. Boys accounted for 64.5 percent of these. Rates were 270.9 per 100,000 for boys and 159.2 per 100,000 for girls.

Rates of Child and Youth Falls Injury Hospitalization, by Age Group (years) and Sex, BC, 2003-2007.



Cause of injury resulting from falls varied by age group. Among young children ages 0 to 4 years, the leading causes were falls from: Bed/chair and other furniture (49.3/100,000), Playground equipment (30.7/100,000), and Stairs/steps/ladder/scaffolding (17.6/100,000).

Leading causes among children 5 to 9 years were falls from Playground equipment (105.2/100,000), Slipping, tripping and stumbling (23.9/100,000), and Bed/chair/other furniture (20.9/100,000).

Leading causes among older children 10 to 14 years were falls from Slipping, tripping and stumbling (40.2/100,000), Playground equipment (31.0/100,000), and Same level (27.5/100,000). Leading causes among youth 15 to 19 years were falls from Slipping, tripping and stumbling (26.6/100,000), Same level (22.4/100,000), and Stairs/steps/ladder/scaffolding (12.6/100,000).

Types of falls injury resulting in hospitalization included: fracture; intracranial; dislocation; open wound; internal organ; sprain and strains; and superficial injury.

Trends

The rates of child and youth falls injury hospitalization display downward trends from 2003 to 2007 across the five BC Health Authorities. Trends are statistically significant for BC, Vancouver Coastal and Vancouver Island Health Authorities.



CHIRPP Vignettes

A 2 month old baby girl, sustained a head injury after she was buckled in her car seat, dropped and fell down 5 wooden stairs.

A 6 month old baby boy fell down the stairs in his walker and sustained a head injury.

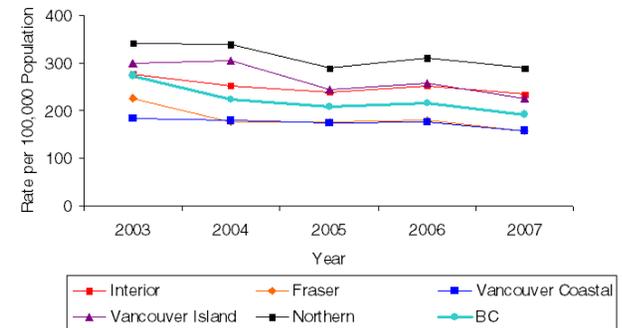
A 1 year old boy was diagnosed with a head injury after falling down a flight of stairs because the baby gate was left open.

A 7 year old boy was wearing heelys and fell onto icy concrete, hurting his arm.

A 9 year old girl was playing on the trampoline and fell through an opening in the safety net onto landscape tile, injuring her arm.

A 17 year old girl on a boat cruise, injured her knee after falling down the stairs while wearing high heels.

Age Standardized Rates of Child and Youth Falls Injury Hospitalization by Health Authority, BC, 2003-2007.



Prevention Evidence

Children and youth are injured from falls on a daily basis. Evidence-based injury prevention strategies for the major locations and types of falls are discussed.

AT HOME

Best Practices

There are specific strategies that are proven effective including:

- Stair gates [1]
- Eliminating baby walkers [2-4]
- Window guards [5]
- Community/broad based public education [6, 7]
- Active involvement of property managers [8]
- Home visits by a registered nurse to survey for safety hazards [9, 10]

Emerging Strategies

- Do not use bunk beds [2]
- Multiple home safety visits by a registered nurse [10, 11]
- Be cautious in using safety products that were previously owned and ensure that they meet any current consumer product safety guidelines [12]
- Remember that infant safety products are not a replacement for supervision [12]
- Education about toddler's vulnerability to injury in the home and instructing parents about what situations are hazardous, should

- be considered during development of toddler home injury prevention programs [13]
- Engineering approaches such as the design of products or components of the house for passive protection [14]
- Enforcement approaches such as standards, regulation, and legislation to reduce childhood injuries [14]
- Parenting education and training
- Education only [15, 16]
- Education and home visiting programmes [15]
- Education and pediatric practice-based interventions [15]

AT PLAY

Playgrounds/Outdoor Climbing Frames

Best Practices

Effective prevention measures for playgrounds:

- Impact-absorbing surfacing [17-19]
- Impact deceleration <200 G and head injury criteria (HIC) <1000. This corresponds to 2.5m maximum for equipment height and 20cm minimum surface depth [17, 20]
- Fewer or no swing sets [17]

Emerging Strategies

- Height restrictions for playground equipment [2, 17, 21]
- Reduce equipment height to 1.5-1.9m [22]
- Maintenance of playground tanbark should occur at intervals no greater than 3 months and impact testing of surfaces should be completed during regular maintenance [20]

- Arm fracture specific criteria should be considered when implementing future standards [22]
- Installation of guard rails [22]

OUT AND ABOUT

Falls from Shopping Carts

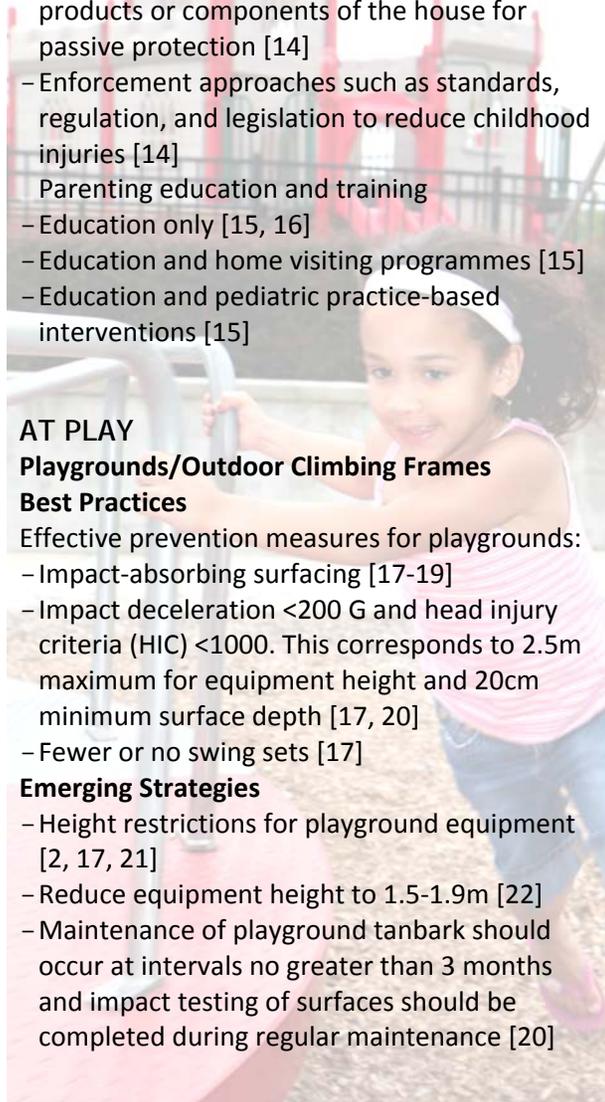
Best Practices

In the United States, research on falls from shopping carts provided evidence-based injury prevention strategies including:

- \$2 incentive coupon plus greeters at the store entrance who encouraged the use of appropriate shopping cart restraints [23]
- Informational signs, fliers and public address announcements within stores to remind shoppers about safe shopping cart use and child restraint [24, 25]

Emerging Strategies

- Place the child in a lower seat position, closer to the ground to lower the centre of gravity and decrease the potential for tip over [23]
- A shopping cart safety performance standard should include a comprehensive performance requirement for the child restraint system [23]
- Standards for shopping carts should be revised to include performance criteria to prevent falls and tip-over [23, 26]
- Safety strategies include: supervised in-store child play areas; pick-up areas or assistance bringing purchases to the vehicle; more stable carts; strollers or wagons for in-store use [23, 26]



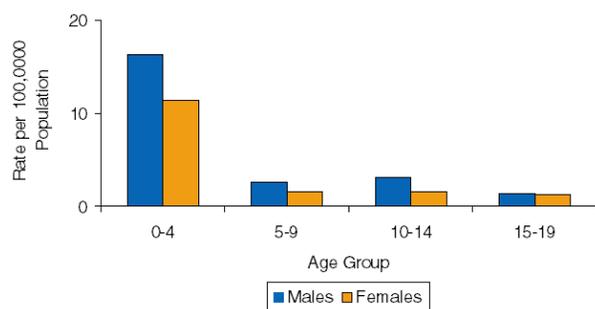
SAFETY AT HOME - SUFFOCATION, BURNS AND POISONING

The Facts

There were 16 suffocation deaths (including choking, hanging & strangulation) among BC children and youth from 2003 to 2007, for a rate of 0.3 per 100,000. The majority (9) of these deaths were among 0 to 4 year olds.

There were 218 hospitalizations from suffocation among BC children and youth from 2003 to 2007, with a rate of 4.5 per 100,000. Boys accounted for 61 percent of these. Rates were 5.3 per 100,000 for boys and 3.6 per 100,000 for girls. The leading cause for all ages was choking from inhalation of food, vomit or other objects with a rate of 3.9 per 100,000. Fourteen hospitalizations were from hanging and strangulation.

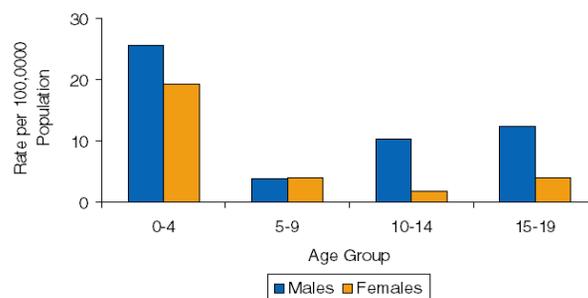
Rates of Child and Youth Suffocation Injury Hospitalization, by Age Group (years) and Sex, BC, 2003-2007.



Seven burn-related deaths occurred among BC children and youth from 2003 to 2007, for a rate of 0.1 per 100,000. The majority of these deaths were among 10 to 14 year olds.

There were 479 injury hospitalizations from burns and scalds among BC children and youth from 2003 to 2007, with a rate of 9.8 per 100,000. Boys accounted for 67 percent of these. Rates were 12.8 per 100,000 for boys and 6.7 per 100,000 for girls. The leading causes were burns from hot drinks, food, fats and cooking oils for 0 to 4 year olds (6.76/100,000); and ignition of highly flammable material/clothing for 5 to 19 year olds (2.1/100,000).

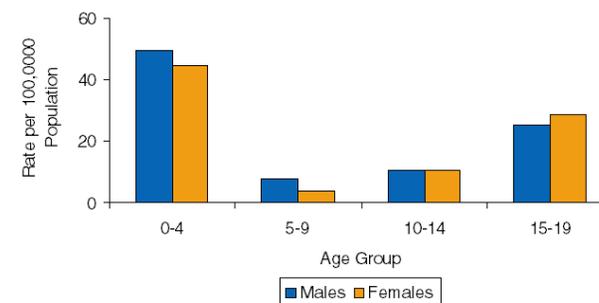
Rates of Child and Youth Burns Injury Hospitalization, by Age Group (years) and Sex, BC, 2003-2007.



Poisonings accounted for 31 deaths among BC children and youth from 2003 to 2007, for a rate of 0.6 per 100,000. The majority (27) of these deaths were among 15 to 19 year olds.

There were 1,067 poisoning-related hospitalizations among BC children and youth from 2003 to 2007, with a rate of 21.9 per 100,000. Boys accounted for 53 percent of these. Rates were

Rates of Child and Youth Poisoning Injury Hospitalization, by Age Group (years) and Sex, BC, 2003-2007.



22.3 per 100,000 for boys and 21.4 per 100,000 for girls.

Specific causes of poisoning-related hospitalization vary by age group. Among young children ages 0 to 4 years (47.1/100,000):

1. Other and unspecified medication: 29.6/100,000
2. Other/unspecified chemicals and noxious substances: 9.8/100,000
3. Organic solvents, hydrocarbons and their vapours: 4.1/100,000

Leading causes among children 5 to 9 years (5.8/100,000) were poisonings from:

1. Other/unspecified chemicals and noxious substances: 2.5/100,000
2. Other and unspecified medication: 1.9/100,000
3. Organic solvents, hydrocarbons and their vapours: 1.1/100,000

Leading causes among older children 10 to 14 years (10.6/100,000) were poisonings from:

1. Other and unspecified medication: 4.8/100,000
2. Other/unspecified chemicals and noxious substances: 2.1/100,000
3. Alcohol: 1.8/100,000

Leading causes among youth 15 to 19 years (26.8/100,000) were poisonings from:

1. Other and unspecified medication: 15.4/100,000
2. Alcohol: 4.4/100,000
3. Hallucinogens: 3.2/100,000

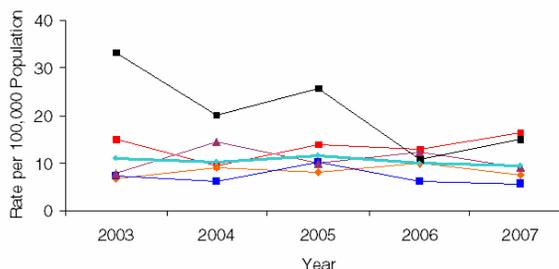
Trends

Hospitalization rates of child and youth burn injuries displayed a non-significant downward trend from 2003 to 2007 in the Vancouver Coastal and Northern Health Authorities. However, Interior, Fraser and Vancouver Island Health Authorities showed non-significant upward trends in burns from 2003 to 2007.

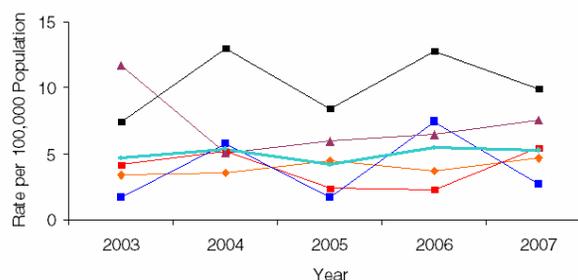
The rates of child and youth injury hospitalization from suffocation displayed a non-significant upward trend from 2003 to 2007 across all of BC's Health Authorities, except for Vancouver Island where a non-significant downward trend is observed.

The rates of child and youth injury hospitalization from poisoning display a downward trend from 2003 to 2007 across BC's Health Authorities. Only the BC trend was found to be statistically significant at $p < 0.05$.

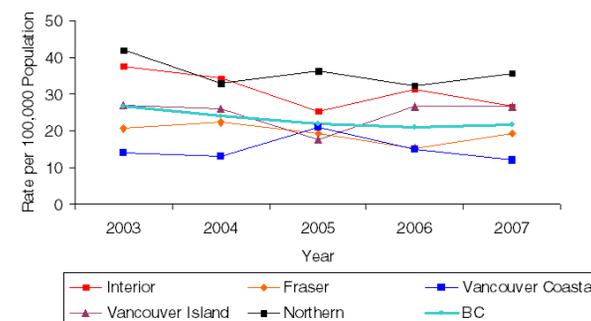
Age Standardized Rates of Child and Youth Burns Injury Hospitalization by Health Authority, BC, 2003-2007.



Age Standardized Rates of Child and Youth Suffocation Injury Hospitalization by Health Authority, BC, 2003-2007.



Age Standardized Rates of Child and Youth Poisoning Injury Hospitalization by Health Authority, BC, 2003-2007.



CHIRPP Vignettes

A 2 year old boy sleeping on a bed was found with his head wedged between the mattress and bedframe, causing suffocation.

A 4 year old girl was playing and inhaled a thumb tack, which got stuck in her lung.

An 8 year old boy was eating chicken wings and got a bone stuck in his throat.

A 2 year old girl was sitting in her high chair and pulled a freshly made cup of tea off the table, burning her arm, leg and trunk.

A 6 year old girl was playing and grabbed the hot curling iron, burning her hand.

An 8 year old boy was burned while helping his dad cook breakfast. He slipped forward from the chair he was standing on and his arm hit the hot griddle.

A 14 year old boy burning his mouth when the firecrackers which he put into his mouth exploded.

A 3 year old girl got into her grandma's purse and ingested 1 mg of amlodipine.

A 4 year old girl was playing in the bathroom with her sister and drank Drano from the bottle that was left open.

A 4 year old boy was playing with a set of recalled crayons. He developed lead poisoning after ingesting parts of them.

A 16 year old female was at the mall with a male companion and took 3 tabs of Ecstasy.

A 17 year old male was unable to sleep so he ingested 10 X 50mg of benadryl.

Prevention Evidence

HOME SAFETY

Research has shown that parents have unrealistic expectations of children, lack an understanding of their child's development, and accept that injury is a norm [1]. If these factors are not addressed, safety in the home will continue to be compromised.

Best Practices

One-on-one home safety education in a clinical setting or at home, with provision of safety equipment has been shown to lead to:

- Safe hot tap water temperatures [2-4]
- Functional smoke alarms [4]
- Safe storage of medicines and cleaning products [4]
- Accessible poison control centre numbers [4]
- Fitted stair gates [4]
- Electrical outlet covers [4]
- Safe storage of sharp objects [4]
- Fireplace guards [4]
- Reducing/eliminating use of baby walkers

Parenting education and training has shown the efficacy of:

- Education only [3, 5]
- Education and home visiting programmes [5]
- Education and pediatric practice-based interventions [5]

Emerging Strategies

- Engineering approaches such as the design of products or components of the house for passive protection [4]
- Enforcement approaches such as standards, regulation, and legislation to reduce childhood injuries [4]

CHOKING/SUFFOCATION

Best Practices

- Withhold foods of a size that may cause choking in young children (e.g. grapes, hard candies, peanuts) [6, 7]
- Refrain from feeding hotdogs as well as hard, round foods with high elasticity or lubricity properties to children under 3 years of age [6]
- Provide a proper sleep environment for babies: supine positioning; firm sleep surface; no soft objects/loose bedding; avoid co-sleeping; use only crib/bassinet/cradle that conforms to safety standards [8]

Emerging Strategies

- Check the Health Canada Product Recall page on a regular basis
- Teach children in grade school about preventing choking hazards [9]



FIRE, FLAMES AND HOT SUBSTANCES

Best Practices

- Installation of cooker safeguards (guardrail around the edge of stove) [2]
- Lower tap water temperature [2, 3, 10]
- Tap water temperature legislation plus education [3]
- Functioning smoke detectors/alarms [10, 11]
- Flame retardant children's sleepwear [10, 11]
- Housing/building codes that assure safe electrical wiring [11]
- Community-based fire prevention interventions [12]
- Long-life lithium batteries in new smoke alarm installations [13]
- Requirement of landlords to test and maintain smoke alarms [13]
- Home visitation programmes that focus on electrical systems [14]
- Connecting electrical extension cords with insulation tape [14]

Emerging Strategies

- Consider the reach capability of the child when designing interventions [2]
- Community smoke alarm give-away programmes [2, 15]
- Emphasize the link between child development and the risks for injury when promoting prevention efforts to parents [2]
- Individualized safety counselling [2]
- Utilization of the 'spectrum approach' such that prevention is shifted from individually focused education to a systems approach [2]
- Six actions to address burn injuries using the spectrum approach [2]:
 - Clinicians advising parents about the potential for kitchen scalds when children

reach, at 9 months through to two years of age

- Community scald awareness day
- Require child care providers to have injury prevention training that includes burns
- Develop a community coalition to build a partnership approach
- Encourage the media to offer a fixed slot for a regularly scheduled announcement of local injury incidents
- Design innovations to eliminate/reduce hazards and include special instructions and warnings for use around children

POISONING

Best Practices

- Locked medication storage/medication lock boxes/cabinet locks [13]
- Home safety education combined with the provision and fitting of cupboard locks or catches [16]
- To decrease adverse drug events, intense web-based clinical education with point-of-care drug references and a zero-tolerance policy for incomplete or incorrect orders [17]
- Child resistant packaging [14, 16, 18]
- Home visitation programmes providing plastic containers with childproof caps and warning labels, and bags that allow for the safe storage of poisonous substances [14]



Emerging Strategies

- Limit the quantity of medicine supplied [16]
- Encourage safe disposal of unused drugs [16]
- Pharmacists to provide advice about topics such as safe storage, cabinet locks and lockable medicine cabinets, the difference between 'child resistant' and 'child proof', actions to take if a poisoning occurs [16]
- Comprehensive toxicology screens as part of routine evaluation of children presenting to emergency rooms with apparent life-threatening events [19]
- Cleaning products kept out of children's sight and reach, in original containers, with caps replaced immediately after use [18]
- Buy the minimum amount required and buy the least toxic product, dispose properly, do not combine cleaning products [18]
- For children exposed to lead or at high risk for lead exposure, clinicians to refer children to developmental programs for children at high risk for exposure to lead [20]
- Physicians and pharmacists supporting parents to establish lead-safe environments [20]

SPORTS AND RECREATION INJURIES – AS BEST WE SEE THEM

The Facts

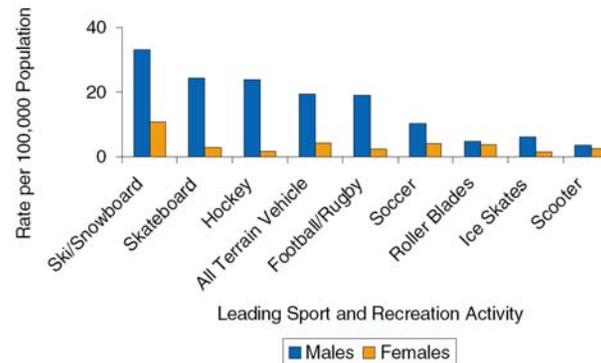
A total of 5,644 injury hospitalizations occurred from sport and recreation activities among children and youth in BC from 2003 to 2007. Boys accounted for 80 percent of these. Rates were 191.4 per 100,000 for boys and 45.0 per 100,000 for girls.

The leading types of these sport and recreation activities were: Ski/snowboard, Skateboard, Hockey, All Terrain Vehicle, Football/rugby, Soccer, Inline Skates, Ice Skates and Scooters. These types varied among age groups. For 0 to 4 year olds, the most common type of injury hospitalizations was from the use of scooters. Ski/snowboard was the leading cause of hospitalization for all other age groups; however the second most common injury was from Skateboards in 5-9 and 10-14 year olds and Hockey in 15-19 year olds.

Leading Sport and Recreation Child and Youth Injury Hospitalization (rates per 100,000) by Age Group (years), BC, 2003-2007				
	0-4	5-9	10-14	15-19
Ski/Snowboard	*	5.8	34.4	40.9
Skateboard	*	4.9	23.1	22.9
Hockey	0.0	1.4	19.1	26.6
All Terrain Vehicle	0.6	4.8	16.8	21.7
Football/Rugby	*	0.8	13.1	25.3
Soccer	*	2.4	10.3	13.9
Inline Skates	*	3.3	10.2	2.4
Ice Skates	0.0	1.1	7.3	6.0
Scooter	1.2	3.8	5.4	2.9

All ages combined, Ski/snowboard was the leading Sport and Recreation activity leading to injury hospitalization for both boys (35.5/100,000) and girls (10.0/100,000). Leading activities among girls ranked differently than among boys.

Rates of Leading Sport and Recreation Child and Youth Injury Hospitalization, by Sex, BC, 2003-2007.



Note: The leading causes of Sports and Recreational injury are Cycling and Playground. These topics are not included in this section, but are addressed in

- Road Safety – Pedestrians and Cyclists
- Falls – At Home and Play.

Leading Type of Child and Youth Sport and Recreation Injury Hospitalization (rates per 100,000), by Age Group (years), BC, 2003-2007				
	0-4	5-9	10-14	15-19
Fracture	3.8	30.6	138.2	137.6
Intracranial injury	1.0	3.3	10.7	11.5
Internal organ	0.0	1.4	7.8	12.6
Dislocation	0.0	0.5	3.1	8.6
Sprain/strain	0.0	0.1	2.3	10.6
Superficial injury	0.1	0.7	2.5	3.4
Open wound	0.5	2.0	1.8	1.9

Fracture was the most common type of injury sustained resulting in hospitalization across all age groups.

CHIRPP Vignettes

A 6 year old gymnast broke her elbow after falling from a vaulting horse and hitting the metal base.

A 14 year old hockey player lost consciousness and was diagnosed with a head injury after being crosschecked in the face, hitting the boards and falling to the ice.

A 15 year old hockey player was checked into the boards. Two players fell on top of him, seriously injuring his thorax.

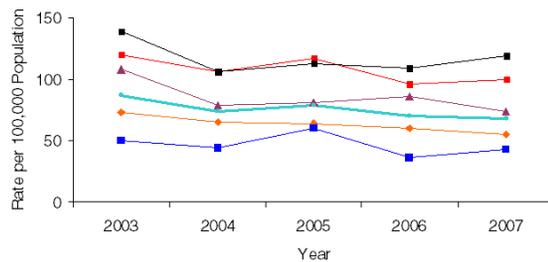
A 16 year old student broke his foot in Phys Ed class by dropping a 50lb weight on it.

A 17 year old snowboarder injured her neck when she was cut off by a skier and did a face plant in the snow.

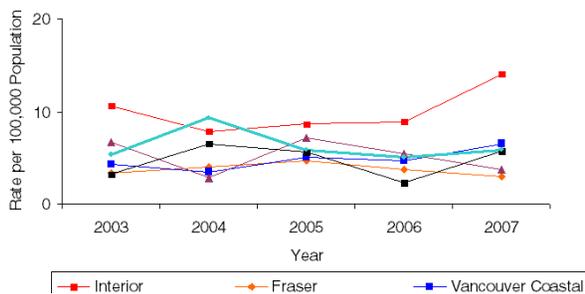
A 19 year old soccer player sustained an MCL injury when she collided with another player at full speed.

Trends

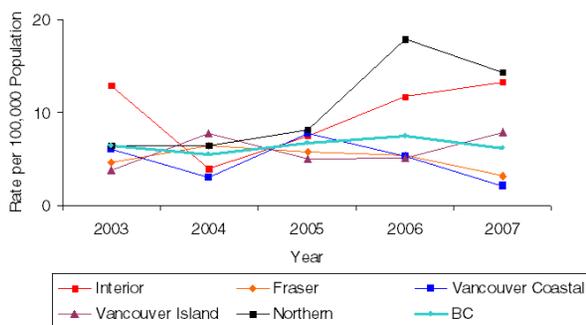
Age Standardized Rates of Sport and Recreation Child and Youth Fracture Injury Hospitalization, by Health Authority, BC, 2003-2007.



Age Standardized Rates of Sport and Recreation Child and Youth Internal Organ Injury Hospitalization, by Health Authority, BC, 2003-2007.



Age Standardized Rates of Sport and Recreation Child and Youth Intracranial Injury Hospitalization, by Health Authority, BC, 2003-2007.



The rates of child and youth injury hospitalization from Fractures displayed downward trends from 2003 to 2007 across all of BC's Health Authorities. Trends were statistically significant for BC and Fraser and Vancouver Island Health Authorities at $p < 0.05$. Child and youth injury hospitalization rates from Internal Organ and Intracranial Injury showed no trends.

Prevention Evidence

Injuries frequently occur by being struck by an object or another person, especially during sports and recreation activities. Wearing safety gear can lead to increased risk-taking; children feeling protected by injury prevention practices may have increased levels of sensation seeking, and parents may reinforce this phenomenon. [1]

Best Practices

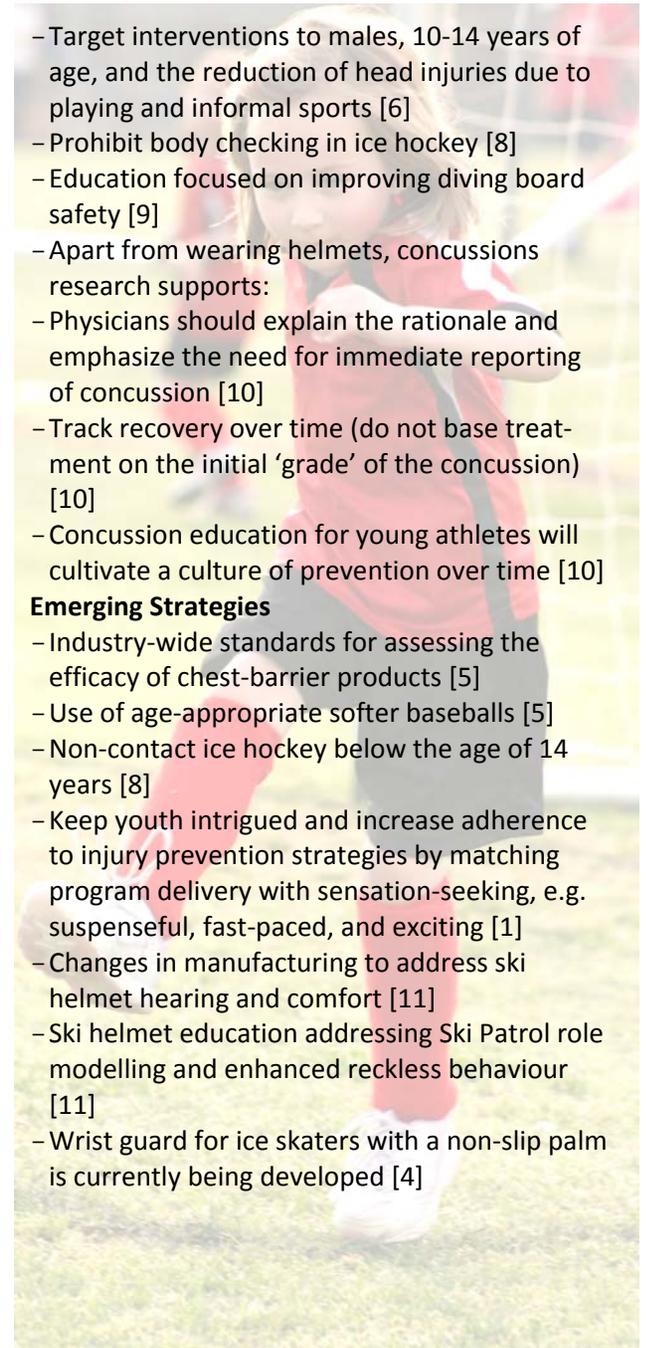
Effective strategies to prevent sports and recreation injuries include:

- Correct instruction by coaches/teachers [2]
- Stretch and strengthen to prevent injury, e.g. shoulders [3]
- Use of appropriate sport-specific protective equipment, e.g. helmets, wrist guards, chest-protectors [4, 5]
- Increased supervision, e.g. during recess [6]
- Ensure playground equipment complies with Canadian Standards Association (CSA) guidelines [6]
- For adolescents engaging in multiple risk behaviours, optimize the physical environment; try to establish norms surrounding peer-group behaviour; establish strategies for adult supervision [7]

- Target interventions to males, 10-14 years of age, and the reduction of head injuries due to playing and informal sports [6]
- Prohibit body checking in ice hockey [8]
- Education focused on improving diving board safety [9]
- Apart from wearing helmets, concussions research supports:
 - Physicians should explain the rationale and emphasize the need for immediate reporting of concussion [10]
 - Track recovery over time (do not base treatment on the initial 'grade' of the concussion) [10]
 - Concussion education for young athletes will cultivate a culture of prevention over time [10]

Emerging Strategies

- Industry-wide standards for assessing the efficacy of chest-barrier products [5]
- Use of age-appropriate softer baseballs [5]
- Non-contact ice hockey below the age of 14 years [8]
- Keep youth intrigued and increase adherence to injury prevention strategies by matching program delivery with sensation-seeking, e.g. suspenseful, fast-paced, and exciting [1]
- Changes in manufacturing to address ski helmet hearing and comfort [11]
- Ski helmet education addressing Ski Patrol role modelling and enhanced reckless behaviour [11]
- Wrist guard for ice skaters with a non-slip palm is currently being developed [4]



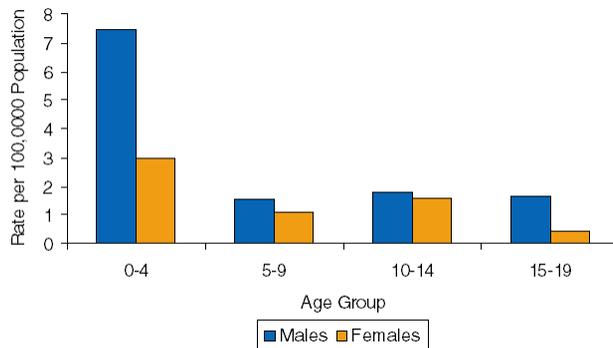
WATER SAFETY

The Facts

There were 30 deaths from drowning among BC children and youth from 2003 to 2007, for a rate of 0.6 per 100,000. The majority (15) of these deaths were among 15 to 19 year olds.

There were a total of 107 injury hospitalizations from near drowning among BC's children and youth from 2003 to 2007, with a rate of 2.2 per 100,000. Boys accounted for 68 percent of these. Rates were 2.9 per 100,000 for boys and 1.4 per 100,000 for girls.

Rates of Child and Youth Drowning Injury Hospitalization, by Age Group (years) and Sex, BC, 2003-2007.



Cause of injury hospitalization resulting from near drowning varied by age group. Among young children ages 0 to 4 years (5.3/100,000):

1. Swimming Pool: 1.6/100,000
2. Bathtub: 1.2/100,000

Leading causes among children 5 to 9 years (1.3/100,000) were near drowning from:

1. Swimming Pool: 0.8/100,000

Leading causes among older children 10 to 14 years (1.7/100,000) were near drowning from:

1. Swimming Pool: 0.7/100,000
2. Natural Water: 0.5/100,000

Leading causes among youth 15 to 19 years (1.1/100,000) were near drowning from:

1. Natural Water: 0.4/100,000
2. Swimming Pool: 0.36/100,000

According to the Canadian Red Cross:

- Most boating related drowning (90%) occurred where the victim was not wearing a life vest or PDF [1]
- In non-drowning cases the most common cause of death and injury was trauma from incidents such as boat crash, followed by cold water immersion [1]
- In almost one half of drowning cases with toddlers throughout Canada the child was alone [2]
- Life vests and PDFs were less likely to be worn the less skill an individual had with swimming [1]

CHIRPP Vignettes

A one year old baby was left unattended in the bath. When mom returned, the baby was submerged in the tub.

A 2 year old was found face down in an inflatable pool where she nearly drowned.

A 6 year old was found unconscious at the bottom of a pool at a birthday party. She was just learning how to swim.

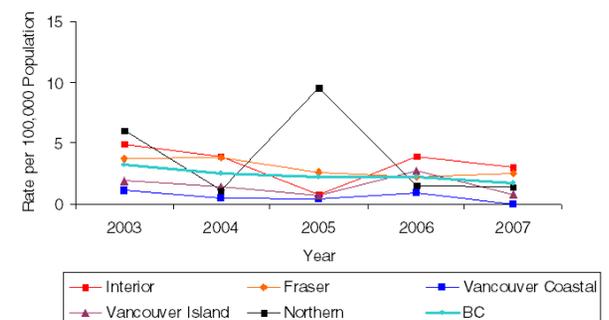
An 8 year old was found with her head stuck in a 20 foot water wheel. She had been dragged underwater and trapped for 10 minutes.

An 11 year old was playing the breath holding game in a lake under the dock. She was found floating facedown and almost died.

Trends

The rates of child and youth injury hospitalization from near drowning display a downward trend from 2003 to 2007 across BC's Health Authorities. Only the BC trend was found to be statistically significant at $p < 0.05$.

Age Standardized Rates of Child and Youth Drowning Injury Hospitalization by Health Authority, BC, 2003-2007.



Prevention Evidence

POOL SAFETY

Best Practices

Strategies that have proven effective in preventing drowning include:

- 4-sided Pool Fencing [3-5]
- Well-maintained 4-sided pool fencing with self-closing, self-latching gate [5,6]



- Close adult supervision [7-9]
- Visible depth indicators surrounding the pools [10]
- Cardiopulmonary resuscitation (CPR) training for pool owners and care givers [7-9]
- Children are more likely to wear life vests and PDFs if they are comfortable [9]

Emerging Strategies

- Pool alarms and covers [6]
- Poolside emergency equipment, including a telephone, and a first aid kit [7-9]

YOUNGER CHILDREN

Best Practices

- No unsupervised access to toilet [6, 11]

- No unsupervised shared bathing with older siblings in the bathtub [4, 11]
- The introduction of fencing around play areas close to rivers and lakes [
- Do not leave water in pails or buckets [6, 11]

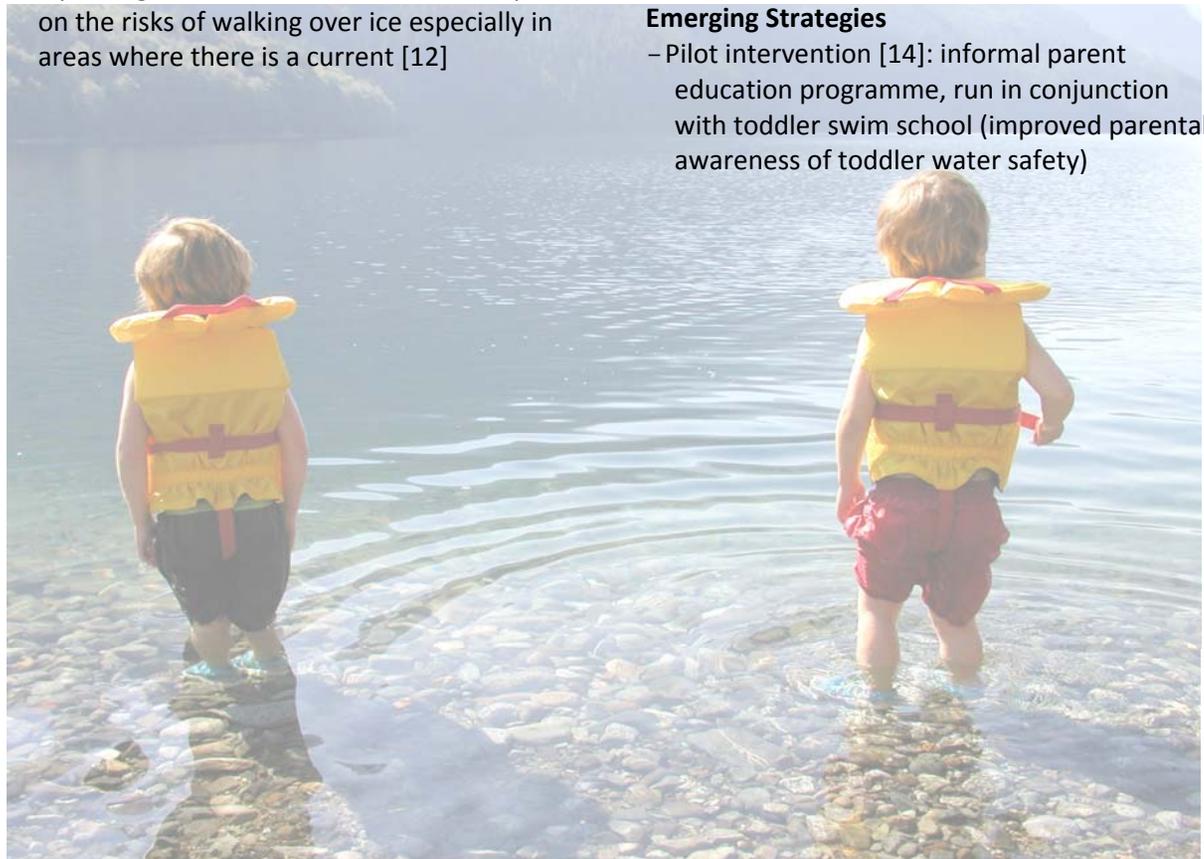
OLDER CHILDREN AND ADOLESCENTS

Best Practices

- Swimming lessons [5]
- Education [5]
- No alcohol use [5, 7-9]

Emerging Strategies

- Improving the education of children and youth on the risks of walking over ice especially in areas where there is a current [12]



RURAL AREAS

Best Practices

- Installation of barriers next to bodies of water (lakes, rivers, etc.), near residential areas [13]
- Provide first aid training in drowning to clinicians in villages [13]
- CPR for local residents [13]
- Installation of covers on wells [5, 13]

ROLE OF HEALTH CARE PROFESSIONALS

Best Practices

- Education for patients [5]
- Advocate for legislation [5]

Emerging Strategies

- Pilot intervention [14]: informal parent education programme, run in conjunction with toddler swim school (improved parental awareness of toddler water safety)

PREVENTING SELF HARM

The Facts

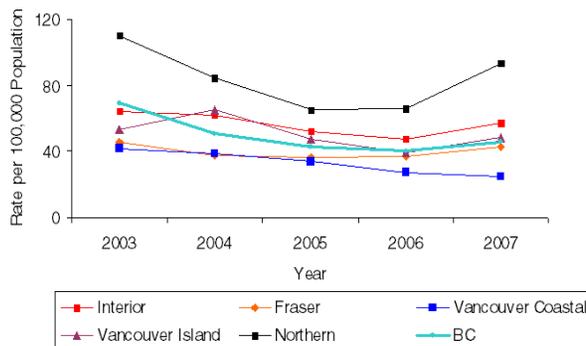
There were 99 deaths from self harm among BC children and youth from 2003 to 2007, for a rate of 2.0 per 100,000. The majority (88) of these deaths were among 15 to 19 year olds.

There were a total of 2,669 injury hospitalizations from self harm among BC's children and youth from 2003 to 2007, with a rate of 54.8 per 100,000. Girls accounted for 74 percent of these. Rates were 27.2 per 100,000 for boys and 84.2 per 100,000 for girls. The leading causes of self harm were from self poisoning (47.4 per 100,000) and cutting/stabbing (5.3 per 100,000).

Trends

The rates of child and youth injury hospitalization from self harm display a downward trend from 2003 to 2007 across BC's Health Authorities; statistically significant for Vancouver Coastal Health Authority only ($p < 0.05$).

Age Standardized Rates of Child and Youth Self Harm Injury Hospitalization by Health Authority, BC, 2003-2007.



Prevention Evidence

SELF HARM

Best Practices

- An intervention that has been effective in repeat self harmers is the provision of depot flupenthixol and dialectical behaviour therapy [1]

Emerging Strategies

- Problem-solving therapy [1]
- Emergency contact cards [1]
- Long-term psychological therapy for patients with borderline personality disorder [1]

SUICIDE

Best Practices

Evidence-based practices and recommendations for suicide prevention include:

- Prevention efforts should target high-risk groups: male, older, Aboriginal or white [2]
- At school: screening students for mental health problems and referring them to appropriate mental health professionals [2]
- Provide teachers with training to recognize depression and mental health disorders [2]
- In the community: passive strategies such as bridge safety barriers, detoxification of cooking gas and car exhaust, changes to packaging of analgesics [3]
- Education of media regarding responsible reporting of suicides and provision of crisis hotlines [2]
- Training of primary care physicians to recognize, treat and refer patients [4]

- Family, friends, teachers and primary care physicians should be supervising youth who have survived a suicide attempt very closely as they are at high risk for completing a suicide, violent death and psychological outcomes [2]
 - Advocate to include mental health services in health insurance benefit packages [5]
- #### Emerging Strategies
- Parents, teachers, counsellors, friends and healthcare providers should learn to recognize the warning signs for children and youth who play the 'choking game'. The warning signs include: mention of the game; bloodshot eyes; marks on the neck; frequent, severe headaches; disorientation after spending time alone; ropes, scarves and belts tied to bedroom furniture, doorknobs, or knotted on the floor [6, 7]

CHIRPP Vignettes

A very unhappy 13 year old girl cut her hand and abdomen with a knife as a suicidal gesture.

A 13 year old boy was found hanging from a door knob by a neck tie. He had strangled himself.

A 15 year old female was depressed and overdosed on alcohol, marijuana, benzodiazepine, cocaine, amphetamines and then jumped off a bridge.

A 16 year old male attempted suicide by overdosing on insulin. Three empty vials were found with him.

An 18 year old female was very upset and was fighting with all her family members. She consumed 12 extra strength tylenol (500mg) and 12 ibuprofen (200mg).

PREVENTING ASSAULT

The Facts

There were 40 deaths from assaults among children and youth in BC from 2003 to 2007, for a rate of 0.8 per 100,000. The majority (29) of these deaths were among 15 to 19 year olds.

There were a total of 1,905 injury hospitalizations from assaults among children and youth in BC from 2003 to 2007, with a rate of 39.1 per 100,000. Boys accounted for 86 percent of these. Rates were 64.9 per 100,000 for boys and 11.5 per 100,000 for girls. Leading cause of assault was Maltreatment/ neglect for 0 to 4 (9.1/100,000) and 5 to 9 year olds (1.0/100,000). Bodily force was the leading cause among 10 to 14 (10.1/100,000) and 15 to 19 year olds (69.4/100,000); followed by Sharp/blunt objects (2.7/100,000 and 34.2/100,000 respectively).

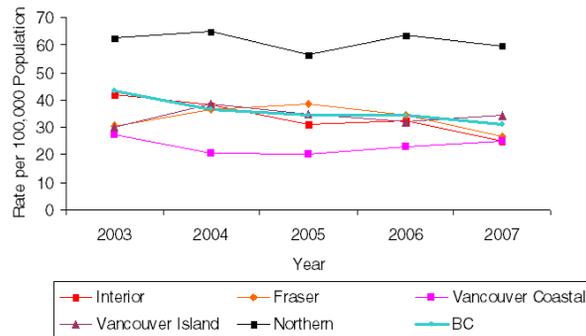
Trends

The rates of child and youth injury hospitalization from assault display downward trends



from 2003 to 2007 across all BC's Health Authorities except for Vancouver Island which had a slight upward trend. Downward trends were statistically significant for BC and Interior Health Authority.

Age Standardized Rates of Child and Youth Assault Injury Hospitalization by Health Authority, BC, 2003-2007.



CHIRPP Vignettes

A 2 year old baby girl's injuries were diagnosed as shaken baby syndrome.

A 6 year old girl had a temper tantrum and was sent to her room. Mom's boyfriend threw her onto the bed and spanked her.

A 10 year old boy was playing basketball with classmates. A fight broke out, he was thrown to the ground, kicked and punched.

A 17 year old boy's father was upset with him. He pulled him by the hair, grabbed him by the neck, threw him on the ground and kicked and punched him.

Note: There is an urgent need for rigorous research (primary evaluations) to guide gang prevention policy and programming [7]

Prevention Evidence

Best Practices

Strategies for preventing assault include:

- School-based programmes [1]
- Home visitation by registered nurses [2, 3]
- Parental training programmes for treating child abuse and neglect [3, 4]
- Providing information, education, and counselling for Shaken Baby Syndrome [5]

Emerging Strategies

- Mothers' boyfriends not living in the house with mothers' biological children [2]
- Target biological fathers and male caregivers (e.g. mother's boyfriend) [2]
- Broader messages that include early childhood development training and methods to identify safe and appropriate care [2]
- Policies and resources to ensure quality daycare for low-income mothers [2]
- Public health approach to violence prevention:
 - Surveillance to define the magnitude of the problem [6]
 - Analysis to highlight risk factors and high risk groups [6]
 - Evaluative research to identify interventions that work [6]
 - Implementation of what works [6]
- Opportunities provision is a strategy to prevent gang involvement based on the principle of providing youth with educational and employment opportunities (e.g. tutoring, remedial education, job training/ placement) as an alternative to gang involvement [7]

OPPORTUNITIES FOR BC

BC is a progressive province in its attention to child and youth injury prevention and has implemented many prevention initiatives over the past 15 years. Improved legislation, such as tougher impaired driving penalties, distracted driver legislation, car booster seat laws and bicycle helmet legislation for all ages, are prime examples of public policy that reduce child and youth injuries. Strong partnerships and coalitions in BC have resulted in improved operating policies and practices to reduce injuries among young workers, to prevent unintentional poisonings and childhood burns and scalds, as well as a particular focus on injury prevention among First Nations children and youth. And, non-government organization (NGO) leadership has led to reductions in child drowning, the prevention of bullying, harassment and abuse, and more recently, social marketing campaigns to address risky attitudes and behaviours that lead to injury.

Still, too many children and youth succumb to injury in BC. On average, each year 104 children and youth die and 6,625 are hospitalized because of their injuries, potentially leading to disability. The vast majority of these injuries are entirely preventable.

Following on the momentum created by the Vancouver 2010 Olympic and Paralympics Games, the government of BC has created a prevention strategy as a commitment to keep British Columbians among the healthi-

est people in Canada. The four pillars of physical activity, healthy eating, living tobacco-free, and consuming alcohol responsibly will lead to improvements in health and disease prevention in BC. The prevention strategy and accompanying four pillars also provides BC with many opportunities to expand the focus on the prevention of chronic disease to include injury prevention as a critical component to healthy living.

An investment in the prevention of child and youth injuries will result in significant reductions in the number of young lives lost, the number of young people who suffer life-long disability, and the number of children and youth who require trauma, hospital and emergency care. By reducing the number of children and youth who are injured, this focused investment on injury prevention could decrease the direct and indirect financial costs, making significant funds available to other important health issues.

In March of 2010, Canada's Chief Medical Health Officer, David Butler-Jones, announced in the Federal Speech from the Throne that government has the opportunity to take a strong leadership and coordinating role in the prevention of child and youth injury. BC can use this strong leadership to provide a coordinated and unified voice regarding the Federal strategy that includes input from injury prevention stakeholders in BC.

To prevent accidents that harm our children and youth, our Government will... work in partnership with non-governmental organizations to launch a national strategy on childhood injury prevention.

3 March 2010, Ottawa, Ontario

It has been identified at the national level by government and NGOs that there is a need for better support and dedicated focus on injury prevention. There are opportunities in BC to capitalize on the leadership present in the many provincial and national NGOs working diligently to develop recommendations, policies and to implement evidence-based injury prevention initiatives, often with very limited resources. By partnering with these NGOs, BC has the opportunity to support the delivery of leading edge, evidence-based child and youth injury prevention initiatives to appropriate stakeholders and the public.

Joint work on this front includes opportunities for the government of BC together with NGO and other stakeholders to support child and youth injury prevention programming include:

[Occupant Safety and Motor Vehicle Crashes](#) – In partnership with BCAA Traffic Safety Foundation and Safe Kids Canada, expand the reach of current programs to educate parents on installing and using infant and child car restraints, and educating parents and children on required booster seat use. [1]

Young Drivers – Advance changes to legislation related to the operation of off-road vehicles and snowmobiles, to include age restrictions and personal protective equipment (helmet and other) use. [2]

Road Safety - Pedestrians & Cyclists – Increase public education concerning the importance of bicycle helmets, and their correct and appropriate use in partnership with ThinkFirst and Safe Kids Canada; and ensuring increased enforcement of bicycle helmet use legislation in partnership with police forces. [2]

Falls - At Home & Play – Partner with the Canadian Home Builders' Association of British Columbia to update the BC Building Code to ensure windows on the second storey and higher have a proven mechanism to prevent falls [3, 4]; partner with the BC Recreation and Parks Association, and BC School Districts to update playgrounds to meet the current voluntary Canadian Safety Standards for equipment and surfacing. [4]

Home Safety - Suffocation, Burns & Poisoning – Increase the dissemination of home safety through programs such as Safe Start, the injury prevention program of BC Children's Hospital; and increase the dissemination of education regarding safe storage to prevention poisoning by working with the BC Drug and Poison Information Centre (DPIC) at the BC Centre for Disease Control. [4]

Sports & Recreation – Partner with municipal Boards of Parks and Recreation and sporting organizations to increase education and enforcement of protective gear such as helmets. [4]

Water Safety - Pools, Boating & Young Children – Expand current programming to educate parents and children on water safety, such as partnering with SMARTRISK Canada and the Canadian Red Cross to promote their Buckle up! Drive Sober! Look First! Wear the Gear! Get Trained! Initiative to avoid water-related injuries [5], or with Safe Kids Canada to promote their “Five Layers of Protection” to eliminate unnecessary risk and keep children safe in, on and around water: Actively Supervise, Get Trained, Create Barriers, Use Life Jackets, and Teach Kids to Swim [5]

Self Harm & Assault – Partner with Red Cross (involving programs such as RespectED) and others to conduct sustained school-based education that emphasize respect, non-violence and gender equity. [6]

Further regional, national and global recommendations for child and youth injury prevention are listed in Appendix B.

Conclusion

The recent national declaration on prevention and promotion highlights the inclusion of injury prevention as a means of improving quality of life [7]. The Government of BC has called for a greater focus on effective prevention strategies as a critical part of the health care puzzle that

will help keep people out of the hospital systems, reduce crisis care intervention, and create a healthier, more active and productive population. The BC Injury Research and Prevention Unit, established by the Ministry of Health and the Minister's Injury Prevention Advisory Committee in August 1997, is a national leader in injury prevention and an example of BC's significant investment in injury prevention.

Still, there is more to do.

The BC Framework for Core Functions in Public Health includes the Prevention of Unintentional Injury and the Prevention of Violence, Abuse and Neglect; yet the injury prevention profile is vulnerable as Health Authorities, NGOs and other stakeholders strive to work within limited resources.

The next steps for child and youth injury prevention in BC need to include a targeted reinvestment in injury prevention in order to maintain the reductions in injury that have been demonstrated over the past several years. The opportunities as described here for government to work in partnership with NGOs and others, and to provide leadership and coordination, are necessary to continue to reduce the burden of child and youth injuries in BC.

Investing in prevention and the promotion of health should be undertaken for the same reasons that we treat disease and injury: not just because of the economic gains that will be realized, but because it is the hallmark of a civilized, humane and caring society.

Dr. Perry Kendall, 2010 [8]

METHODOLOGY

Data Sources

The three datasets used for this report were:

- BC Vital Statistics
- Discharge Abstract Database
- BC Children’s Hospital Emergency Department data from the Canadian Hospitals Injury Reporting and Prevention Program (CHIRPP)

MORTALITY: Mortality data were provided by the BC Vital Statistics Agency. This report is based on 521 injury deaths from 2003 to 2007 among children and youth (ages 0 to 19 years) who were known residents of BC. The mortality dataset includes external causes of death classified as injury deaths according to the International Classification of Diseases (ICD-10) [1].

HOSPITAL SEPARATIONS: Source data were obtained from the Discharge Abstract Database, BC Ministry of Health Services. This report is based on 33,124 injury hospitalizations during the fiscal years 2003/04 to 2007/08 among children and youth (ages 0 to 19 years) who were known residents of BC. Data for this study include external causes of injury classified according to ICD-10. Causes of injury categories were derived according to the same coding scheme as used for mortality data. The hospitalization data also include Type of Injury codes.

CHIRPP: Data were extracted from the emergency department of BC Children’s Hospital for the year 2007. This report is based on 8,439

injuries captured by BC CHIRPP. This surveillance system collects in-depth information regarding the patient’s age and sex; the date, time and place of injury occurrence; the activity when injured, cause of injury, type of energy transfer inducing the injury (e.g. mechanical, etc.) and factors contributing to the injury; the nature of injury, body area affected by the injury and the outcome of the emergency department visit.

Data Limitations

Complete accuracy and consistency of mortality data cannot be assumed because physicians and other health professionals responsible for diagnosing and coding the cause of death differ in their skills and practices. Some variation in death certification and coding practices may exist.

Hospitalization data can vary over time and between areas for factors not related to health, such as accessibility of treatment, and medical and administrative decisions that may affect the number of hospitalizations and lengths of hospital stay [2, 3].

The CHIRPP emergency department data are not representative of all regions of BC. BC Children’s Hospital is the only BC hospital participating in CHIRPP, and captures children from across the Lower Mainland as well as higher severity cases from across BC. As such, this is not considered to be population-based data; data are presented as frequencies and proportions only. It is also important to note that CHIRPP forms may not be

completed for all injuries seen in the emergency department as it is neither the parent’s nor physician’s priority at the time of admittance.

Although external causes of injury are uniformly classified and analyzed according to the ICD-10 for both mortality and hospitalization data, CHIRPP data are not coded using this system. As a result, it is not possible to compare CHIRPP data with these other sources. Furthermore, due to inconsistencies in CHIRPP coding over the past few years, years previous to 2007 were excluded from this report.

Analysis (ICD codes)

Analyses

Rates were calculated per 100,000 population for age, sex, year, leading cause of injury and Health Authority. Age-specific rates are used throughout the report. Additional analyses were conducted by comparing the age standardized rates over time. To show differences in age structures across regions, rates were standardized using BC ‘91 population as the standard population.

The age-specific rates were calculated by dividing the number of cases in each age group by the population of that specific age group. Age-standardized rates were calculated using a reference population of known age distribution called a standard population to adjust for variations in population age structures among the different Health Authority geographic areas.

SPSS Version 17.1 for Windows was used to calculate the Age-Specific and Age-Standardized rates. Trend analyses were conducted using a Chi-square test for trend [4], to test the statistical significance of the association between injuries over time. This test appraises the linear component of the relationship between injury rates and scores allocated to the categories of time (calendar years).

The analysis of BC CHIRPP allowed for the examination of several variables describing the pre-injury, injury and post-injury phases [5]. Specifically, patterns of injury among males and females were described by time (year, month, day of the week, and time of day), location of injury (where the injury occurred), activity and nature of injury.

“An Electronic Resource Allocation Tool (ERAT) was developed by SMARTRISK, providing a classification and costing framework combining existing data with variables from the literature in order to model full episodic costs for unintentional and intentional injuries. ERAT is a flexible tool that can be updated as new data become available and according to changes in population, injury incidence, treatment patterns and costs. As such, it is a useful resource that can be used by researchers and public health officials at the provincial and local level to support resource allocation, policy development, and decision-making.” [6]. The ERAT tool provides summary of costs by age group and cause of injury.

To calculate the current economic burden in BC, this tool has been updated with the average cost

of care in BC, 2007 BC mortality and hospitalization cases and rates, as well as adjusted disability rates for the hospitalization cases. The total, direct and indirect costs for children and youth ages 0 to 19 years have been recalculated using these age group summaries. The value used to calculate the average cost of care in BC was \$5,012.



RESOURCES

International

Alaska Injury Prevention Center
<http://www.alaska-ipc.org/>

American Academy of Pediatrics
<http://www.aap.org>

Boost – Child Abuse Prevention and Intervention
<http://www.boostforkids.org/>

Brain Injury Association of America
<http://www.biausa.org/>

Childabuse.com – Prevention Through Education and Awareness
<http://www.childabuse.com/>

Consumer Product Safety Commission
<http://www.cpsc.gov/>

European Center for Injury Prevention
http://www.unav.es/ecip/english/pagina_9.html

Food and Drug Administration (<http://www.fda.gov/>)

FRIENDS National Resource Center for Community Based Child Abuse Prevention
<http://www.friendsnrc.org/>

Home Safety Council
<http://www.homesafetycouncil.org>

Injury Control Center – Uganda
<http://www.iccu.or.ug/>

Injury Prevention Network of Aotearoa New Zealand – Links to Injury Prevention Websites
<http://www.ipnanz.org.nz/page.php?p=47>

International Research Council on Biomechanics of Injury
<http://www.ircobi.org/index.htm>

International Society for Child and Adolescent Injury Prevention
<http://iscaip.net/iscaip/>

International Society for Prevention of Child Abuse and Neglect
<http://www.ispcan.org/>

International Society for Violence and Injury Prevention
<http://www.isvip.org/>

National Fire Protection Association
<http://www.nfpa.org/>

National Safety Council
<http://www.nsc.org/>

Safe Kids Worldwide
<http://www.safekids.org/>

Safe Kids USA
<http://www.usa.safekids.org/>

SafetyLit
<http://www.safetylit.org/>

Ski-injury.com Stay Safe on Snow
<http://www.ski-injury.com/>

Stop it Now! Preventing Sexual Abuse of Children
<http://www.stopitnow.org/>

University of North Carolina Injury Prevention Research Center
<http://www.iprc.unc.edu/>

National

Alberta Centre for Injury Control and Research

<http://www.acicr.ualberta.ca/>

Canada Safety Council

<http://safety-council.org/>

Canadian Automobile Association

<http://www.caa.ca/>

Canadian Injury Prevention and Control Curriculum

<http://www.canadianinjurycurriculum.ca/>

Government of Canada – Healthy Canadians

http://www.healthycanadians.gc.ca/pr-rp/saf-sec_e.html

Government of Nova Scotia Injury Prevention

http://www.gov.ns.ca/hpp/cdip/injury_prevention.asp

Highway Safety Roundtable

http://www.fatigueauvolant.ca/sec_par/en_partners.asp

Injury Prevention Across the Life Span

<http://www.ipals.ca/>

Injury Prevention Research Office at St. Michael's Hospital

<http://www.injuryprevention.ca/>

with links to Injury Prevention Related Organizations

<http://www.injuryprevention.ca/links.htm>

Insurance Bureau of Canada

<http://www.abc.ca/en/index.asp>

Mothers Against Drunk Driving - MADD

<http://www.madd.ca/>

Organization for the Prevention of Child Abuse and Domestic Violence

<http://www.childabuseprevention.ca/>

Safe Communities Canada

<http://www.safecommunities.ca/>

Safe Kids Canada

<http://www.safekidscanada.ca/>

SMARTRISK

<http://www.smartrisk.ca/>

ThinkFirst Foundation of Canada

<http://www.thinkfirst.ca/index.aspx>

Transport Canada

<http://www.tc.gc.ca/en/tc-main.htm>

Provincial

Ambulance Paramedics of BC

<http://www.apbc.ca/home/>

BC Coroners Service

<http://www.pssg.gov.bc.ca/coroners/>

BC Crisis Centre

<http://www.crisiscentre.bc.ca/>

BC Drug and Poison Information Centre

<http://www.dpic.org/index.php>

BC Farm and Ranch Safety and Health Association

<http://www.farsha.bc.ca/>

BC Injury Prevention Centre

<http://www.injuryfreezone.com/>

BC Medical Association

<https://www.bcma.org/>

BC Ministry of Child and Family Development

<http://www.gov.bc.ca/mcf/>

BC Ministry of Forests and Range
<http://www.gov.bc.ca/for/>

BC Ministry of Healthy Living and Sport
<http://www.gov.bc.ca/hls/>

BC Professional Fire Fighters' Burn Fund
<http://www.bcpffa.org/>

BC Safety Authority
<http://www.safetyauthority.ca/>

BCAA Traffic Safety Foundation
<http://www.tsfbcaa.com/>

Children First Prince George
<http://www.childrenfirstpg.com/injuryprevention.htm>

DriveSmart BC
<http://www.drivesmartbc.ca/>

Greater Victoria Cycling Coalition
<http://www.gvcc.bc.ca/>

HealthLinkBC
www.healthlinkbc.ca

Insurance Corporation of British Columbia
<http://www.icbc.com/>

Kelowna Fire Museum and Education Centre
<http://www.firemuseum.ca/>

London Drugs On-Line Health Library
<http://www.ldhealth.com/Health%20Library/index.asp?mId=13>

Office of the Superintendent of Motor Vehicle
<http://www.pssg.gov.bc.ca/osmv/>

Prevent Shaken Baby Syndrome BC
<http://www.dontshake.ca/index.php>

RCMP in BC
<http://bc.rcmp.ca>

Safe Kids BC – Child Abuse Prevention
<http://www.safekidsbc.ca/>

Terasen Gas
http://www.terasengas.com/_Safety/

The Community Against Preventable Injury
<http://www.preventable.ca/>

ThinkFirst BC
http://www.thinkfirst.ca/chapters/in_bc.aspx

Victoria Family Violence Prevention Society
<http://www.familyviolence.ca/splash.htm>

Specialized

[First Nations/Inuit/Métis](#)

BC Injury Research and Prevention Unit
<http://www.injuryresearch.bc.ca/>

Canadian Pediatrics Society
<http://www.cps.ca/english/publications/FirstNationsAndInuit.htm>

Canadian Red Cross
<http://www.redcross.ca/search.asp>

First Nations' Public Health – Partnerships in Injury Prevention
<http://fnpublichealth.ca/injury-prevention/partnerships/>

First Nations Regional Longitudinal Health Survey
<http://www.rhs-ers.ca/english/>

Health Canada
<http://www.hc-sc.gc.ca/fniah-spnia/index-eng.php>

Public Health Agency of Canada
<http://www.phac-aspc.gc.ca/chn-rcs/aboriginal-autochtones-eng.php>

Safe Kids BC - Child Abuse Prevention
<http://www.safekidsbc.ca/links.htm#aboriginal>

[Convert to French](#)

Brain Injury Association of Canada
<http://biac-aclc.ca/fr/>

Canada Safety Council
<http://safety-council.org/fre/>
Canadian Automobile Association
<http://www.caa.ca/home-f.cfm>

Canadian Pediatric Society
<http://www.cps.ca/francais/index.htm>

Canadian Red Cross
<http://www.croixrouge.ca/article.asp?id=6&tid=003>

Government of Canada – Healthy Canadians
http://www.healthycanadians.gc.ca/pr-rp/saf-sec_f.html

Government of Nova Scotia Injury Prevention
<http://www.gov.ns.ca/hpp/f/>

Health Canada
<http://www.hc-sc.gc.ca/index-fra.php>

MADD
http://www.madd.ca/home_fr.html

Public Health Agency of Canada
<http://www.phac-aspc.gc.ca/index-fra.php>

RCMP in BC
<http://bc.rcmp.ca/ViewPage.action?siteNodeId=14&languageId=4&contentId=-1>

Resources

Safe Kids Canada
<http://www.safekidscanada.ca/securijeunescanada/default.asp>

ThinkFirst Foundation of Canada
<http://www.thinkfirst.ca/fr/index.aspx>

Transport Canada
<http://www.tc.gc.ca/fr/tc-principal.htm>

[Convert to Other Languages](#)

BCAA Traffic Safety Foundation
<http://www.tsfbcaa.com/53.aspx>

HealthLinkBC
<http://www.healthlinkbc.ca/multicultural.stm>

Safe Kids BC - Child Abuse Prevention
<http://www.safekidsbc.ca/links.htm#chinese>

Safe Kids Canada
<http://www.safekidscanada.ca/SKCFForParents/section.asp?s=Safe+Kids+Canada+Resources&SID=25017>

Terasen Gas – Little Experts
<http://www.terasengas.com/Safety/>

Safe Start
<http://www.bcchildrens.ca/KidsTeensFam/ChildSafety/SafeStart/SafeStartresources.htm>

SUCCESS
<http://www.successbc.ca/>

GLOSSARY

Age Specific Rates: The rate of death per 100,000 population in the specified age group for a given year. Age Specific Rates provide more detailed examination of hospitalization and mortality issues by age than is provided by summary standardized measures such as age standardized rates. When rates are presented by an age group breakdown, the crude rates are often referred to as Age Specific Rates. Population estimates have been used to calculate the age specific rates.

Age Standardized Rates: A summary of age adjusted death or hospitalization rates that have been standardized to a 'standard' population (1991 BC Census) for the purpose of rate comparisons between genders, disparate geographic regions or populations, or over time periods. This rate is the theoretical number of deaths or hospitalizations per 100,000 population that would have occurred in the standard population if the age groups in the standard population were dying or hospitalized at the same rate as the population in question. Or, in other words, the age standardized rate is the theoretical number of deaths or hospitalizations per 100,000 population that would have occurred in the population in question if it had the same age group distribution (proportions) as the standard population. These rates are selected to remove any discrepancies due to age structure differences (all age groups 0-90+) in population. A specific age group cannot be selected when requesting for age standardized rates. **Note:** Only age standardized rates that have been calculated to the same standard populations are comparable. In addition, the age standardized rate is a theoretical value used for rate comparison that does not represent the actual rate of death or hospitalization observed in a population.

Cutting/Piercing: Injury caused by cutting or piercing instrument or object; fall on sharp object; powered hand tools or appliances

Drowning & 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

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

Fire, Flames & 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

Homicide & Violence/Maltreatment: The infliction of fatal or non-fatal injuries by another person, by any means, with intent to kill or injure. Injuries resulting from legal intervention and operations of war are excluded

Hospitalization Cost: This provides the total direct costs for a particular injury. This is useful in demonstrating the economic burden of the specified injury. This value is calculated using the Resource Intensity Weight (RIW) for each patient.

ICD-10: International Classification of Diseases (ICD), tenth revision

Intent (of injury): The role of human purpose in an injury incident

Intentional Injury: Injuries that are purposely inflicted, either by a person to him/herself or to another person. Examples suicide or attempted suicide, homicide, rape, assault, domestic abuse, elder abuse, and child abuse

Injury: Any unintentional or intentional damage to the body resulting from acute exposure to thermal, mechanical, electrical or chemical energy or from the absence of such essentials as heat or oxygen

Injury Death: The underlying cause of death is injury

Injury Hospitalization: Hospitalization for acute inpatient care for all injuries where the patient left the hospital by discharge or death.

Motor Vehicle Crash: Any collision or non-collision involves in one or more motor vehicle (s), which is designed primarily for transportation on the road. Including operator or passenger in motor vehicle; any person riding on a pedal cycle involved in a collision or non-collision injury associated with a motor vehicle; pedestrian walking or with pedestrian conveyance injured in any collision or non-collision traffic incident involving a motor vehicle; occupant of motorcycle involved in collision or non-collision traffic and non-traffic accident. Note: This category has been created by BCIRPU specifically to include any incidents involving a "motor vehicle" only and exclude other transport related incidents. Other databases may not include this category, therefore comparisons cannot be made.

Non-MV Pedal Cycle: Any person injured in a non-motor vehicle incident involving a pedal cycle

Percentage: This presents the number of cases as a proportion of the total cases. The denominator to calculate the percentages is ALL injuries, which includes both intentional and unintentional injuries.

Struck by/against: Struck by falling object, striking against or struck by persons or objects, caught unintentionally between objects. Excludes striking against person or object with a fall; injury involving operating machinery or motor vehicle; cutting or piercing instrument; incident resulting in drowning or submersion

Suffocation: 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

Suicide & Self-inflicted: Fatal or non-fatal injuries purposefully caused by the victim to him/herself

Unintentional injury: Injury that is not purposely inflicted, either by the patient or anyone else. In the past, unintentional injuries were referred to as accidental injuries

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

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APPENDIX A: CATEGORIES FOR INJURY

MOTOR VEHICLE OCCUPANT

V300-V307, V309, V310-V317, V319, V320-V327, V329, V330-V337, V339, V340-V347, V349, V350-V357, V359, V360-V367, V369, V370-V377, V379, V380-V387, V389, V390-V397, V399, V400-V407, V409, V410-V417, V419, V420-V427, V429, V430-V437, V439, V440-V447, V449, V450-V457, V459, V460-V467, V469, V470-V477, V479, V480-V487, V489, V490-V499, V500-V507, V509, V510-V517, V519, V520-V527, V529, V530-V537, V539, V540-V547, V549, V550-V557, V559, V560-V567, V569, V570-V577, V579, V580-V587, V589, V590-V599, V600-V607, V609, V610-V617, V619, V620-V627, V629, V630-V637, V639, V640-V647, V649, V650-V657, V659, V660-V667, V669, V670-V677, V679, V680-V687, V689, V690-V699, V700-V799, V810, V811, V830-V833, V840-V843, V850-V856, V859, V860-V864, V870-V879, V880-V888, V8900, V8901, V8908, V8909, V8911, V8920, V8921, V8928, V8929, V8990, V8991, V8998, V8999.

Operator or passenger in motor vehicle

Includes: Any person riding in a specified or unspecified motor vehicle involved in a collision or non-collision traffic accident

Excludes: Occupant of bicycle and other non motor vehicles, motorcycle, off-road vehicle not on highway, motorized bicycle or wheelchair, pedestrians and persons on the outside of a motor vehicle

CYCLISTS

MOTOR VEHICLE-PEDAL CYCLE RIDER

V120-V125, V129-V135, V139-V145, V149, V194-V196, V199

Any person riding on a pedal cycle involved in a collision or non-collision injury associated with a motor vehicle

Includes: Public highways, parking lots, driveways and other locations

NON-MOTOR VEHICLE PEDAL CYCLE

V010, V011, V019, V100-V105, V109-V115, V119, V160-V165, V169-V175, V179-V185, V189, V193, V802, V889, V8910, V8918, V8930, V8931, V8938, V8939

Any person injured in a non-motor vehicle incident involving a pedal cycle

Includes: Falls from bicycle, bicycle collision with other bicycle, animal, object, non motor vehicle

Excludes: When involving motor vehicles, trains or aircraft

MOTOR VEHICLE PEDESTRIAN

V020, V021, V029-V031, V039-V041, V049, V091-V093, V099, V8907, V8927, V8997

Pedestrian walking or with pedestrian conveyance injured in any collision or non-collision traffic incident involving a motor vehicle

Includes: Public highways, parking lots, driveways and other locations

FALLS

W00-W19

Includes: 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

DROWNING AND SUBMERSION

V900-V909, V920-V929, W65-W70, W73, W74

Includes: 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

FIRE, FLAMES AND HOT SUBSTANCES (BURNS)

X00-X06, X08-X19

Injuries caused by fire and flames; hot appliances, objects or liquids; steam; acid burns

Includes: 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

UNINTENTIONAL POISONING

X40-X49

Unintentional poisonings by drugs, medicinals, biological substances, alcohol, cleansers, petroleum products, agricultural poison food and plants, gases, vapours and other solid or liquid substances

Includes: Solids, liquids, gases and vapours

Excludes: Administration with suicidal or homicidal intent or with intent not determined as unintentional or intentional; adverse reactions to correct drugs properly administered; food poisoning (bacterial); poisoning and toxic reactions to plants; carbon monoxide poisoning from motor vehicle, watercraft, or aircraft in transit; carbon monoxide poisoning from smoke and fumes in fire

SUFFOCATIONS

W75-W81, W83, W84

Inhalation and ingestion of food or objects causing obstruction of respiratory passage or suffocation; unintentional mechanical suffocation

Includes: Smothering, choking

Excludes: Ingestion of a foreign body without respiratory obstruction

SUICIDE AND SELF-INFLICTED

X60-X84

Suicide and self-inflicted injuries

HOMICIDE AND INJURY PURPOSELY INFLICTED BY OTHER

X85-X99, Y00-Y05, Y060-Y062, Y068-Y073, Y078, Y079, Y08, Y09

Injuries inflicted by another person with intent to injure or kill, by any means

APPENDIX B: REGIONAL, NATIONAL AND GLOBAL RECOMMENDATIONS FOR CHILD & YOUTH INJURY PREVENTION

The following regional, national and global level recommendations for child and youth injury prevention have been made by the World Health Organization and Unicef [1], the UN Secretary-General's study on violence against children [2]; the Leitch Report [3], Safe Kids Canada [4], the Canadian Paediatric Society [5], the BC Office of the Chief Coroner Child Death Review Unit [6, 7], and the BC Provincial Health Officer [8].

The 2008 World Report on Child Injury Prevention recommends that action be taken to [1]:

- Integrate child injury into a comprehensive approach to child health and development
- Develop and implementing a child injury prevention policy and a plan of action
- Implement specific actions to prevent and control child injuries
- Strengthen health systems to address child injuries
- Enhance the quality and quantity of data for child injury prevention
- Define priorities for research, and supporting research on the causes, consequences, costs and prevention of child injuries
- Raise awareness of and targeting investments towards child injury prevention

Further, the Provincial Health Officer's 2007 Report on the Health and Well-being of Aboriginal Peoples in BC recommends [8]:

- Developing and delivering education programs to heighten awareness of injury prevention in consultation with Aboriginal communities
- Reviewing injury mortality data (e.g., motor vehicle crashes) and developing local prevention strategies in each community in collaboration with Aboriginal groups

Occupant Safety and Motor Vehicle Crashes

- Make child restraint safety a priority in preventive healthcare [4]
- Increase government investment in child passenger safety [4]
- Encourage programs such as Kids that Click – a joint initiative of Safe Kids Canada and the Hudson's Bay Company – to educate parents on how to install car and booster seats [3]
- Promote the use of appropriate child restraints among First Nations communities [8]

Young Drivers

- Ensure that graduated licensing programs require [3]:
 - Certified practice ≥ 50 hours within the learner phase and 10 hours practice driving in winter conditions
 - Restriction on unsupervised night-time driving from 9:00 p.m. to 6:00 a.m. for probationary drivers
 - Exemptions for travel to and from home to work or school events

- Zero blood alcohol concentration for all drivers ≤ 20 years of age
- Prohibition on probationary drivers ≤ 19 years of age from carrying teen passengers when unsupervised during the first 6-months to 12-months of the licensing period. Exemptions could be made for immediate family members.
- Introduce and enforce off-road vehicle legislation requiring [5]:
 - Minimum operator age of 16 years
 - Passenger restrictions to the number for which the vehicle was designed
 - Compulsory helmet use
 - Mandatory training, licensing and registration
 - Banning the use of three-wheeled vehicles
- Require graduated licensing program for snowmobilers ≥ 16 years of age; children and youth ≤ 15 years not permitted to engage in recreational operation of snowmobiles [5]

Road Safety - Pedestrians & Cyclists

- Reduce speeds/limits in residential communities, around schools and other play areas [1, 4]
- Increase public education and enforcement concerning the importance of bike helmets [5]

Falls - At Home & Play

- Maintain and enforce the national ban on baby walkers [4]
- Place warning labels on car seats and bouncy chairs to let parents know the dangers of putting these products on elevated surfaces [3]
- Change building codes ensuring windows on the second storey and higher have a proven mechanism to prevent falls [1, 4]
- Address playground safety by:
 - Building and maintaining new playgrounds according to the CSA standards [4]
 - Upgrading existing playgrounds by addressing serious hazards first [4]
 - Supporting real-world research on playground safety [4]
 - Supporting legislation requiring licensed child care facilities (excluding residential) to comply with the CSA standard [3]

Home Safety - Suffocation, Burns & Poisoning

- Support enhanced consumer product safety in Canada. Evaluating products pre-market through a child safety lens [4]
- Require smoke alarms in all homes [1, 4]
- Address the need for hot-water tap temperature regulations through building and plumbing codes for residential buildings, laws and public education [1, 4]
- Increase public education about the risks of burns in the home [4]
- Increase cautionary labelling on high-risk medications and warning patients of their potential harm to children [4]

- Update building and fire codes to require carbon monoxide detectors in every home [4]
- Increase public education regarding safe storage to prevent poisonings [4]

Sports & Recreation

- Increase research into the effectiveness of the use and design of alternative environments for recreation, including skate parks [4]
- Increase education and enforcement of protective gear use of such as helmets [4]

Water Safety - Pools, Boating & Young Children

- Enact municipal legislation requiring 1.2 m (4 ft) high, 4-sided pool fencing with self-closing gates [4]. It is recommended that the backside of a house should not be included in fencing enclosures. The BC Pool Safety Advisory Group is currently overseeing development of a community toolkit for residential swimming pool safety.
- Require all boaters to wear life jackets at all times when on board [4]
- Promote tips for avoiding water-related injuries, issued by SMARTRISK and the Canadian Red Cross: Buckle Up! Drive Sober! Look First! Wear the Gear! Get Trained! [6]
- Promote a national ban of baby bath seats [4]
- Create partnerships between governments, communities, industry, private sector bodies and public health agencies to address drowning [1]
- Promote Safe Kids Canada's "Five Layers of Protection" to eliminate unnecessary risk and keep children safe around water: Actively

Supervise, Get Trained, Create Barriers, Use Life Jackets, and Teach Kids to Swim [6]

Self Harm & Assault

- Support community education and advocacy concerning youth suicide, including friends, family members, teachers, coaches, doctors, mental health service providers, and media professionals [7]
- Address The Child Death Review Units 17 specific recommendations for BC concerning mental health, resiliency and suicide prevention for children and youth [7]
- Promote efforts to prevent violence in the family and home as a means of preventing violence in the community [2]
- Provide effective reporting systems for children, allowing children who are victimized to reach trained professionals, e.g. child help lines and community advocates [2]
- Conduct sustained campaigns that emphasize respect, non-violence and gender equity. [2]

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