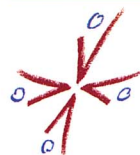




Child & Youth Injury in Saskatchewan



*Saskatchewan Institute on
Prevention of Handicaps*

2002

Child & Youth Injury in Saskatchewan

1995 - 1999

Saskatchewan Institute on
Prevention of Handicaps

May 2002

The Saskatchewan Institute on Prevention of Handicaps is a unique provincial non-profit organization. Its mandate is to raise awareness of preventive measures that can reduce the incidence of handicapping conditions in children. Funding for the Prevention Institute is provided by community-based Members of the Corporation which include the Kinsmen Telemiracle Foundation, Saskatchewan Abilities Council, University of Saskatchewan, Government of Saskatchewan, and the Community at Large.

To obtain additional copies of *Child and Youth Injury in Saskatchewan 1995-1999*, please contact:

Saskatchewan Institute on Prevention of Handicaps

1319 Colony Street

Saskatoon, Saskatchewan S7N 2Z1

Phone: (306) 655-2512

Fax: (306) 655-2511

Website: www.PreventionInstitute.sk.ca

Email: skiph@sk.sympatico.ca

Child and Youth Injury in Saskatchewan 1995-1999 is available on the internet at
www.PreventionInstitute.sk.ca.

ISBN 1-894373-36-7

Copyright 2002 by the Saskatchewan Institute on Prevention of Handicaps

Reproduction, in its original form, is permitted for background use for private study, educational instruction and research, provided appropriate credit is given to the Saskatchewan Institute on Prevention of Handicaps.

Citation in editorial copy for newsprint, radio and television is permitted. The material may not be reproduced for commercial use or profit, promotion, resale, or publication in whole or in part without written permission from the Saskatchewan Institute on Prevention of Handicaps.

Table of Contents

Acknowledgements iii

Executive Summary v

Introduction 1

Overview of Injury-Related Hospitalizations 5

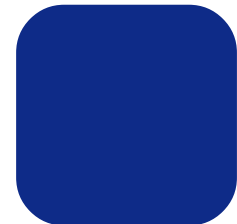
Overview of Injury-Related Deaths 11

**Leading Causes of Injury-Related Hospitalizations
and Deaths for Saskatchewan Children and Youth
Under 20 Years of Age 15**

- Falls 17
- Motor Vehicle Traffic 19
- Self-Injury 21
- Drowning and Choking 23
- Fire and Flame 25
- Poison 27
- Motor Vehicle Pedestrian 29
- Sports 31
- Assaults 33

References 35

Appendix: Methodology 37



Acknowledgements

The Saskatchewan Institute on Prevention of Handicaps produced this report, *Child and Youth Injury in Saskatchewan 1995-1999*, as a source of information on the major causes of serious injuries among Saskatchewan children and youth for the years 1995 to 1999. The report was prepared to serve as a catalyst for injury control programming in this province.

Financial support was provided by the Acquired Brain Injury Partnership Program (Saskatchewan Health and SGI).

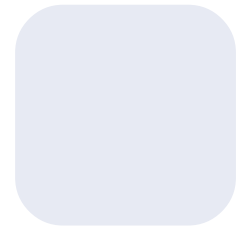
The Prevention Institute thanks the following individuals for their advice and recommendations:

April Barry, Population Health Branch, Saskatchewan Health
Tania Diener, Medical Health Officer, Regina Health District
Winanne Downey, Population Health Branch, Saskatchewan Health
Kelly Froehlich, Acquired Brain Injury Partnership Program, Saskatchewan Health
Shelley Gibson, Policy and Planning Branch, Saskatchewan Health
Shauna Hudson, First Nations and Inuit Health Branch, Health Canada and Saskatchewan Indian Federated College
Mary McNutt, Early Childhood Development Unit, Saskatchewan Learning
William Osei, Population Health Branch, Saskatchewan Health
Kwei Quaye, Traffic Safety Program Evaluation, SGI
Pam Smith, First Nations and Inuit Health Branch, Health Canada and Saskatchewan Indian Federated College

The report is a result of the team efforts of staff members and associates of the Saskatchewan Institute on Prevention of Handicaps:

Ann Schulman, Executive Director
Rosemary Bolaria, Research Officer
Laynni Locke, Coordinator, Child Injury Prevention Program
Noreen Agrey, Health Educator
Tara Grindle, Communications Coordinator
Shannon Booth-Elliott, Communications Coordinator
Rhonda Kitsch, Office Manager
Lan Vu Hoang, Student, Community Health and Epidemiology, University of Saskatchewan

This study is based on data provided by the Saskatchewan Department of Health. The interpretation and conclusions contained herein do not necessarily represent those of the Government of Saskatchewan or the Saskatchewan Department of Health.



Executive Summary



Injuries are a leading cause of death, disability and years of life lost in Canada yet they receive disproportionately little attention. Canada's injury death rate of 9.7 deaths per 100,000 children places it 18th out of 26 industrialized countries (UNICEF, 2001). Within Canada, Saskatchewan had the highest provincial rate of hospitalization due to injury for children and youth under 20 years of age in 1996.

Saskatchewan also had the highest rates of injury-related death for children 1 to 4 and youth 15 to 19 years of age (CICH, 2000).

The Saskatchewan Institute on Prevention of Handicaps produced this report, *Child and Youth Injury in Saskatchewan 1995-1999*, to raise awareness about injuries to children and youth in Saskatchewan and to serve as a catalyst for injury control programming in the province. The report examines injury-related hospitalizations and deaths of Saskatchewan children and youth under 20 years of age during the five years from 1995 to 1999, using data from the Population Health Branch and the Vital Statistics Branch of Saskatchewan Health.

Child and Youth Injury in Saskatchewan 1995-1999 focuses on the most significant causes of injury-related hospitalizations and deaths for Saskatchewan children and youth. The most significant causes discussed in this report are falls, motor vehicle traffic, self-injury, drowning and choking, fire and flame, poison, motor vehicle pedestrian, sports, and assaults.

Injury-Related Deaths and Hospitalizations

From 1995 to 1999, 399 Saskatchewan children and youth under 20 years of age died as a result

of injuries. These included: 20 children under age 1; 58 children 1 to 4 years old; 48 children 5 to 9 years old; 61 children 10 to 14 years old; and 212 youth 15 to 19 years old. A Saskatchewan child or youth died from injury every 4.6 days during this time period. In Saskatchewan, 63% of all deaths of children and youth 1 to 19 years old were due to injuries.

Although death is the most serious result of injury, large numbers of injuries result in hospitalization. During the five-year period from 1995 to 1999, 16,078 hospital admissions among Saskatchewan children and youth were due to injuries: 728 for children under 1 year of age; 3,151 for 1 to 4 year-olds; 2,930 for 5 to 9 year-olds; 3,697 for 10 to 14 year-olds; and 5,572 for 15 to 19 year-olds. These hospitalizations represent 53,347 days of stay. There were 8.8 injury-related hospitalizations per day for Saskatchewan children and youth from 1995 to 1999.

Causes of Injury Deaths and Hospitalizations

The leading causes of injury deaths for all Saskatchewan children and youth under 20 years of age were:

Motor vehicle traffic	38%
Self-injury	17%
Drowning and choking	11%
Motor vehicle pedestrian	7%
Fire and flame	6%

The leading causes of injury-related hospitalizations for all Saskatchewan children and youth under 20 years of age were:

Falls	25%
Self-injury	9%
Motor vehicle traffic	8%
Poison	7%
Sports	7%

Geographic Groups

The report presents injury data for children and youth from four separate geographic groups in Saskatchewan: rural areas, small urban centres, large urban centres, and northern Saskatchewan. Each of these groups has experienced varying patterns and rates of injury-related deaths and hospitalizations. The highest rates of death and hospitalization due to injury occurred in the northern region of Saskatchewan, and the lowest rates in the large urban centres of the province. Rates for males were higher than for females in all age groups.

The rates for specific causes of injury vary among the geographic groups. Rates of hospitalization for falls were highest in the northern area and small urban centres. For motor vehicle traffic injuries, the rates were highest in the rural areas and lowest in the large urban centres. Self-injury and assaults were highest in the northern area and lowest in the rural areas. Rates for drowning and choking, fire and flame, and poisoning were highest in the north. Hospitalization rates for sports injuries were lowest in the north and highest in the rural areas.

The information specific to age, sex and geographic group can enable communities to examine their particular injury situation, determine needs unique to the area, and plan appropriate injury control strategies.

Introduction

Injuries are a leading cause of death, disability and years of life lost in Canada yet they receive little attention. Canada's injury death rate of 9.7 deaths per 100,000 children places it 18th out of 26 industrialized countries. This rate is significantly higher than Sweden (5.2) and the United Kingdom (6.1) which are the two countries with the lowest rates. If all Organization for Economic Cooperation and Development (OECD) countries had the same rate as Sweden, 12,000 injury-related child deaths could be prevented each year world-wide (UNICEF, 2001).

Within Canada, Saskatchewan had the highest provincial rate of hospitalizations due to injury for children and youth under 20 years of age in 1996. Saskatchewan also had the highest rates of injury-related deaths for children 1-4 and youth 15-19 years of age (Canadian Institute of Child Health, 2000).

Hospitalization due to injuries results in large monetary costs to the province. It is estimated that, in 1998, unintentional injuries cost the province of Saskatchewan \$595 million. This means that each injury averaged \$3,500 in direct and indirect costs. These numbers show the economic benefits that could be found through the reduction of injuries both in Saskatchewan and Canada. (SmartRisk, 2001).

This report, *Child and Youth Injury in Saskatchewan 1995-1999*, is a continuation of the report published in 1996, which covered the years 1989 to 1994. These two reports provide a summary of the most serious injuries to Saskatchewan children during the final decade of the century, and serve as a baseline for programming and prevention for the coming years.



This report examines injury-related hospitalizations and deaths of Saskatchewan children and youth under 20 years of age during the five years from 1995 to 1999. The report outlines the causes and types of injuries to Saskatchewan children during this period. The information is presented in categories, including age, sex and geographic group (rural areas, small urban centres, large urban centres, and northern Saskatchewan).

Using this Report

This report was prepared to raise awareness about injuries to children and youth in Saskatchewan and to serve as a catalyst for injury control programming in this province. In order to do this effectively, those working to reduce injuries among Saskatchewan children and youth must have a clear understanding of what injuries are, their causes and effective prevention strategies. In reviewing the statistical information presented, each of these factors should be considered. This report provides a baseline of information on injury-related deaths and hospitalizations for children and youth that can be used to determine areas of greatest need in order to plan and deliver effective programs. Information specific to age, sex and geographic group is included to enable communities to examine their particular injury situation, determine needs unique to the area, and plan appropriate injury control strategies.

Child and Youth Injury in Saskatchewan 1995-1999 focuses on the most significant causes of injury-related hospitalizations and deaths for Saskatchewan children and youth. The most significant causes discussed in this report are falls, motor vehicle traffic, self-injury, drowning and choking, fire and flame, poison, motor vehicle pedestrian, sports, and assaults.

Injuries Versus Accidents

“Accident” is a word used to describe common and rare incidents that result in injuries. When the word “accident” is used to refer to the cause of an injury, it is often assumed that the injury happened due to fate or chance. When an injury is investigated, the cause can clearly be determined. The *British Medical Journal* has banned the inappropriate use of the word “accident” in their journal (Davis and Pless, 2001). Those who are working to prevent injuries to children must continue to promote the belief that injuries are not “accidents” but are indeed predictable and preventable.

Types of Injuries

Injuries can be divided into two types, either unintentional or intentional. Unintentional injuries are those that occur when there is no intent to inflict harm. Intentional injuries are the result of acts of violence (for example, suicide attempts, homicides and assaults).

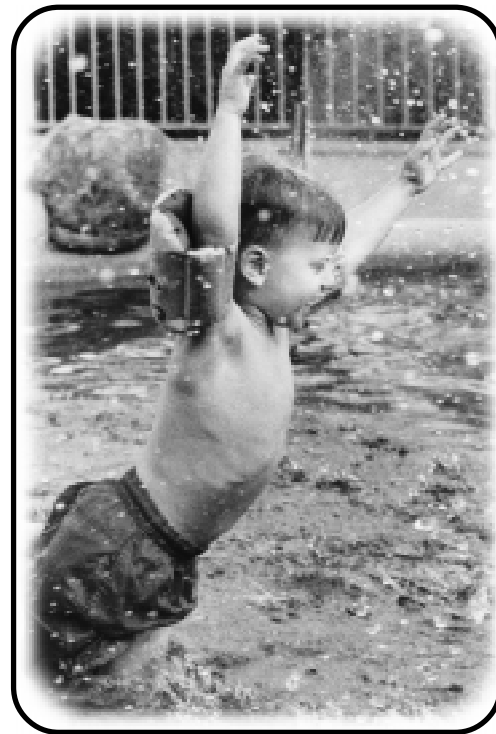
Causes of Injuries

The cause of an injury and why the injury happened are not the same. If a child breaks her arm falling down a flight of stairs, the injury was caused by the fall. Why the injury occurred, however, can be the result of many other factors, such as there was an object on the stairs; a baby gate was not put into place; or the child was not adequately supervised. Many factors must be taken into consideration when determining the cause of an injury, including human behaviour, and also the physical and social environment in

which the injury occurred.

Injury Control Strategies

Effective injury control strategies address the human factor and the physical and social environment in which an injury occurs. Strategies are designed to reduce injuries or their effects and include education, technology, emergency services, acute care, rehabilitation, regulations, and legislation. Each of these strategies, working alone or in combination, has a role in preventing injuries.



Methodology

The data used in the report consist of the number of deaths and hospitalizations of children and youth where the underlying cause is injury. The source of data on deaths is Saskatchewan Health, Vital Statistics. Hospitalization data presented in the report include all hospital discharge/separations where an injury code appears in the record. Hospitalization data were received from Population Health Branch, Saskatchewan Health. It must be noted that the unit of analysis is the hospitalization and not the individual.

Data sources, terminology, ICD9 codes, types of injury, rates, and days of stay are described in the Appendix. The Appendix also includes descriptions of the categories used and presents a discussion of the limitations of the data used for the report.

Table 1.1 Number of Hospitalizations by Injury Cause, Sex and Age Group for Saskatchewan Children and Youth Under 20 Years of Age, 1995-1999

	Under 1						1-4			5-9			10-14			15-19			Total				
	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T		
Adverse Effects of Drugs	59	50	109	129	89	218	63	46	109	68	69	137	89	153	242	408	407	815					
Assaults	33	13	46	48	26	74	16	19	35	59	36	95	371	110	481	527	204	731					
Cut by Sharp Object	*	*	*	41	20	61	39	35	74	62	23	85	128	50	178	272	129	401					
Cycle	0	0	0	18	17	35	126	78	204	155	67	222	53	7	60	352	169	521					
Drowning and Choking	43	42	85	124	109	233	55	45	100	36	13	49	22	7	29	280	216	496					
Environmental	26	30	56	86	72	158	38	34	72	35	33	68	49	25	74	234	194	428					
Falls	108	94	202	501	407	908	839	607	1446	603	348	951	338	203	541	2389	1659	4048					
Fire and Flame	*	*	5	23	14	37	27	12	39	38	*	42	41	7	48	131	40	171					
Hot or Caustic Substances	12	12	24	71	56	127	14	8	22	9	*	13	17	*	20	123	83	206					
MV Non-Traffic	0	0	0	15	7	22	41	17	58	124	50	174	166	43	209	346	117	463					
MV Pedestrian	0	0	0	48	32	80	56	36	92	36	33	69	43	30	73	183	131	314					
MV Traffic	*	7	11	31	26	57	56	36	92	130	86	216	573	384	957	794	539	1333					
Other Transport	*	0	*	18	8	26	35	44	79	89	73	162	73	45	118	217	170	387					
Overexertion	*	0	*	9	5	14	12	7	19	43	37	80	103	49	152	168	98	266					
Poison	35	29	64	445	363	808	48	36	84	36	34	70	56	54	110	620	516	1136					
Self-Injury	0	0	0	9	8	17	6	6	12	70	300	370	305	781	1086	390	1095	1485					
Sports	0	0	0	6	*	9	59	15	74	407	69	476	479	69	548	951	156	1107					
Struck or Caught	20	7	27	85	57	142	122	67	189	112	45	157	130	33	163	469	209	678					
Undetermined Intent	*	0	*	6	*	7	7	*	11	31	43	74	63	96	159	108	144	252					
All Other Injury	49	43	92	79	39	118	84	35	119	126	61	187	246	78	324	584	256	840					
Total	397	331	728	1792	1359	3151	1743	1187	2930	2269	1428	3697	3345	2227	5572	9546	6532	16078					

* Between 1 and 4

Overview of Injury-Related Hospitalizations

This section discusses causes of injury-related hospitalizations, diagnosis, days of stay, and rates of injury hospitalizations for Saskatchewan children and youth under 20 years of age. The information is presented for the province as a whole and for the four geographic groups: rural, small urban, large urban, and northern.

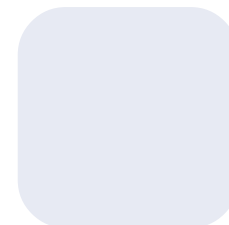
In Saskatchewan, from 1995 to 1999, there were 16,078 injury-related hospitalizations of children and youth under 20 years of age. Table 1.1 shows the number of hospitalizations for children and youth in Saskatchewan by injury cause, sex and age group.

Falls were the leading cause of injury resulting in hospitalization, accounting for a total of 4,048 hospitalizations. Self-injury was second, causing 1,485 hospitalizations, and motor vehicle traffic was third, causing 1,333 hospitalizations. The top three causes accounted for 43% of injury-related hospitalizations. Males accounted for 59% of the total injury-related hospitalizations for children and youth under 20 years of age.

The distribution of injury causes differed among the age groups. Younger children had more hospitalizations due to poisoning and adverse effects of drugs, while older children and youth had more hospitalizations for sports and motor vehicle injuries. Children under 1 year of age experienced 728 injury-related hospitalizations during this time period. Falls caused 28% of the injury-related hospitalizations. Adverse effects of drugs accounted for 15% and drowning and choking for 12%.

There were 3,151 injury-related hospitalizations for children 1 to 4 years of age. Of these hospitalizations, falls accounted for 29%, poison for 26% while drowning and choking, and adverse effects of drugs were responsible for 7% each.

For children 5 to 9 years of age, falls were responsible for 49% of the 2,930 injury-related hospitalizations. The next highest causes, accounting for 17%, were cycle (7%), struck or caught (6%) and adverse effects of drugs (4%).



The main causes of injury resulting in hospitalizations are different for each age group



Falls, motor vehicle traffic and self-injury are the top three causes of injury-related days of stay (DOS)



The 10 to 14 age group experienced 3,697 injury-related hospitalizations. Falls were the leading cause and accounted for 26%. Sports caused 13% of the hospitalizations while self-injury caused 10%.

For youth 15 to 19 years of age, 19% of the 5,572 injury-related hospitalizations were caused by self-injury. Motor vehicle traffic injuries were responsible for 17% of the hospitalizations and sports caused 10%.

Table 1.2 shows the days of stay (DOS) for Saskatchewan children and youth under 20 years of age by injury cause, sex and age group from 1995 to 1999. Falls caused the largest number of days of stay (16%) while motor vehicle traffic caused 13% and self-injury caused 11%. The top three causes accounted for 41% of the total DOS. In all age groups, males experienced more injury-related DOS than females; males accounted for 59% of the total injury-related DOS while females accounted for 41%.

The distribution of injury causes varied for each age group. For children under 1 year of age, adverse effect of drugs accounted for 35% of the 3,898 injury-related DOS. Falls were responsible for 12% while assaults caused 10%.

Falls caused 23% of the 8,972 injury-related DOS for children 1 to 4 years of age. Fifteen per cent were caused by adverse effects of drugs and a further 12% were caused by poison.

Of the 8,701 injury-related DOS for children 5 to 9 years of age, falls were responsible for 33%. The next highest causes were motor vehicle traffic (8%) and motor vehicle pedestrian (7%).

The 10 to 14 age group had a total of 10,977 injury-related DOS for this time period. Falls accounted for the highest number of DOS (20%). Self-injury and sports were each responsible for 10% of the total DOS.

Youth 15 to 19 years of age experienced 20,799 injury-related DOS during this time period. Motor vehicle traffic was responsible for 26%, self-injury for 23% while adverse effects of drugs and falls accounted for 6% each.

Table 1.2 Days of Stay by Injury Cause, Sex and Age Group for Saskatchewan Children and Youth Under 20 Years of Age, 1995-1999

	Under 1			1-4			5-9			10-14			15-19			Total		
	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T
Adverse Effects of Drugs	808	545	1353	936	395	1331	351	189	540	314	481	795	614	689	1303	3023	2299	5322
Assaults	307	101	408	293	112	405	39	68	107	162	108	270	815	361	1176	1616	750	2366
Cut by Sharp Object	*	*	*	136	56	192	98	82	180	190	46	236	239	98	337	665	283	948
Cycle	0	0	0	66	73	139	350	202	552	373	217	590	222	34	256	1011	526	1537
Drowning and Choking	91	111	202	230	169	399	93	62	155	94	26	120	48	10	58	556	378	934
Environmental	133	193	326	303	254	557	107	71	178	84	65	149	228	51	279	855	634	1489
Falls	231	245	476	1144	903	2047	1716	1139	2855	1317	839	2156	751	472	1223	5159	3598	8757
Fire and Flame	*	8	10	90	132	222	272	93	365	418	42	460	240	78	318	1022	353	1375
Hot or Caustic Substances	79	66	145	419	298	717	161	49	210	71	18	89	95	24	119	825	455	1280
MV Non-Traffic	0	0	0	53	50	103	178	56	234	472	194	666	560	168	728	1263	468	1731
MV Pedestrian	0	0	0	320	97	417	361	272	633	222	169	391	231	142	373	1134	680	1814
MV Traffic	20	18	38	171	100	271	383	307	690	526	308	834	3110	2213	5323	4210	2946	7156
Other Transport	6	0	6	81	12	93	151	132	283	278	190	468	223	232	455	739	566	1305
Overexertion	12	0	12	29	10	39	55	10	65	110	76	186	215	85	300	421	181	602
Poison	167	65	232	575	480	1055	67	97	164	57	66	123	130	81	211	996	789	1785
Self-Injury	0	0	0	12	10	22	9	13	22	122	1028	1150	1536	3339	4875	1679	4390	6069
Sports	0	0	0	12	*	16	110	55	165	910	178	1088	951	115	1066	1983	352	2335
Struck or Caught	83	28	111	239	226	465	357	242	599	303	107	410	296	74	370	1278	677	1955
Undetermined Intent	5	0	5	25	*	26	10	5	15	47	65	112	213	533	746	300	604	904
All Other Injury	262	309	571	340	116	456	570	119	689	505	179	684	1035	248	1283	2712	971	3683
Total	2208	1690	3898	5474	3498	8972	5438	3263	8701	6575	4402	10977	11752	9047	20799	31447	21900	53347

* Between 1 and 4

Table 1.3 Average Days of Stay by Injury Cause for Saskatchewan Children and Youth Under 20 Years of Age, 1995-1999

Cause of Hospitalization	Total DOS	Hospitalizations	Average DOS
Adverse Effects of Drugs	5322	815	6.53
Assaults	2366	731	3.24
Cut by Sharp Object	948	401	2.36
Cycle	1537	521	2.95
Drowning and Choking	934	496	1.88
Environmental	1489	428	3.48
Falls	8757	4048	2.16
Fire and Flame	1375	171	8.04
Hot or Caustic Substances	1280	206	6.21
MV Non-Traffic	1731	463	3.74
MV Pedestrian	1814	314	5.78
MV Traffic	7156	1333	5.37
Other Transport	1305	387	3.37
Overexertion	602	266	2.26
Poison	1785	1136	1.57
Self-Injury	6069	1485	4.09
Sports	2335	1107	2.11
Struck or Caught	1955	678	2.88
Undetermined Intent	904	252	3.59
All Other Injury	3683	840	4.38
Total	53347	16078	3.32

Table 1.4 Average Days of Stay by Injury Diagnosis for Saskatchewan Children and Youth Under 20 Years of Age, 1995-1999

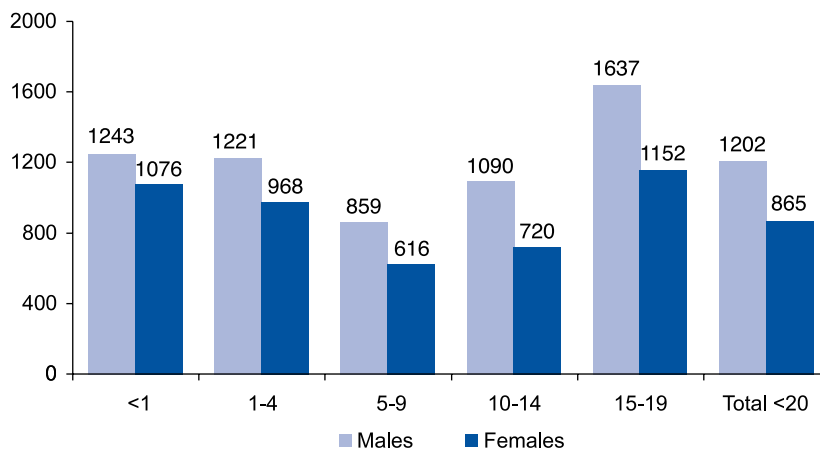
Diagnosis	Total DOS	Hospitalizations	Average DOS
Burns	3084	415	7.43
Blood Vessel	77	20	3.85
Contusion	974	538	1.81
Crushing	123	32	3.84
Dislocation	547	193	2.83
Foreign Object	792	399	1.98
Fractured Limb	12858	4323	2.97
Fractured Skull	2926	620	4.72
Fractured Spine	2450	291	8.42
Internal	1925	353	5.45
Late Effects	914	191	4.79
Nerves and Spinal Cord	169	61	2.77
Open Wound	3345	1165	2.87
Other Cranial	4217	1980	2.13
Poison	5907	2637	2.24
Sprain	582	320	1.82
Superficial	534	200	2.67
Other	11923	2340	5.10
Total	53347	16078	3.32

Table 1.3 shows the average DOS by injury cause for children and youth under 20 years of age in Saskatchewan from 1995 to 1999. Fire and flame caused the highest average DOS (8.04), almost 2.5 times as high as the average. Adverse effects of drugs and hot or caustic substances averaged 6.53 and 6.21 DOS respectively.

Table 1.4 shows the average DOS by injury diagnosis for children and youth under 20 years of age in Saskatchewan from 1995 to 1999. Although fractured spine and burns are the diagnosis for only a combined 4% of injury-related hospitalizations they have the highest average DOS, both over twice as high as the average.

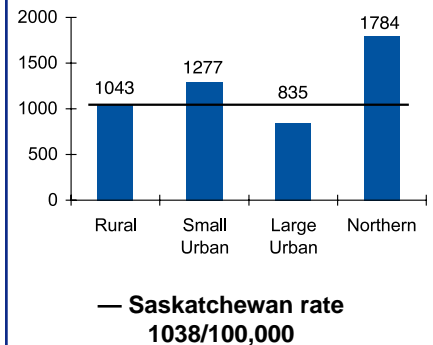
The injury-related hospitalization rates per 100,000 population for children and youth under 20 years of age are shown in Figure 1.1. Youth 15 to 19 years of age have the highest hospitalization rates. Males have higher rates than females in all age groups.

Figure 1.1 Injury-Related Hospitalization Rates (per 100,000 population) by Age and Sex for Saskatchewan Children and Youth Under 20 Years of Age, 1995-1999



Northern children have the highest rate of injury-related hospitalizations per 100,000 population in Saskatchewan as shown in Figure 1.2. Children in large urban areas are the only group whose rate is lower than the average.

Figure 1.2 Injury-Related Hospitalization Rates (per 100,000 population) by Geographic Group for Saskatchewan Children and Youth Under 20 Years of Age, 1995-1999



Fire and flame-related injuries have the highest average days of stay in hospital.

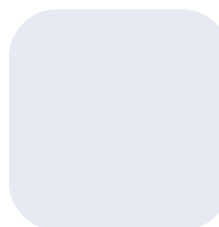
Overview of Injury-Related Deaths

This section discusses injury-related deaths by cause, time trends and rates for Saskatchewan children and youth under 20 years of age. The information is presented for the province as a whole and in the four geographic groups: rural, small urban, large urban, and northern.

Table 2.1 shows both injury-related and total deaths for Saskatchewan children and youth under 20 years of age. The percentage of deaths due to injury increases in the older age groups. Eighty percent of deaths of youth 15 to 19 years of age are due to injuries.

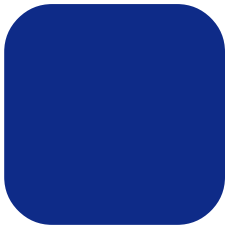
Table 2.1 Number of Injury-Related and Total Deaths by Sex and Age Group for Saskatchewan Children and Youth Under 20 Years of Age, 1995-1999

Age	Sex	Injury Deaths	Total Deaths	% of Deaths Due to Injury
Under 1	Male	9	290	3%
	Female	11	224	5%
	Total	20	514	4%
1-4	Male	39	80	49%
	Female	19	54	35%
	Total	58	134	43%
5-9	Male	28	55	51%
	Female	20	40	50%
	Total	48	95	51%
10-14	Male	44	67	66%
	Female	17	39	44%
	Total	61	106	58%
15-19	Male	155	186	83%
	Female	57	79	72%
	Total	212	265	80%
0-19	Male	275	678	41%
	Female	124	436	28%
	Total	399	1114	36%
1-19	Male	266	388	69%
	Female	113	212	53%
	Total	379	600	63%



The percentage of the total deaths of children and youth due to injury increases with age





As shown in Figure 2.1, the percentage of deaths of children and youth 1 to 19 years of age that are due to injury has fluctuated from 1989 to 1999. There has been an overall downward trend.

Figure 2.1 Percentage of Deaths Due to Injury for Saskatchewan Children and Youth Between 1 and 19 Years of Age, 1989-1999

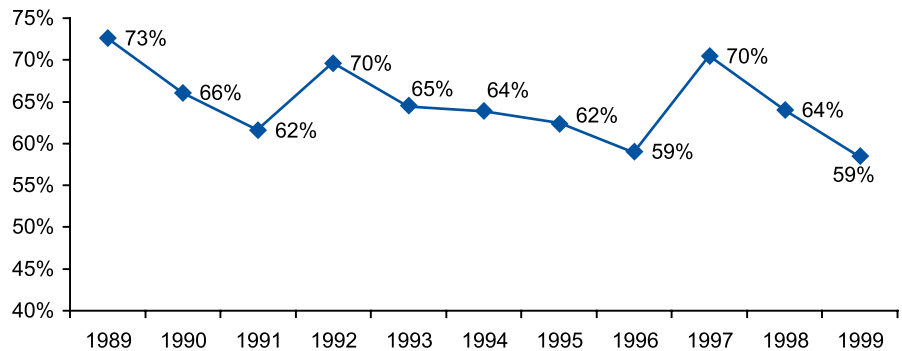


Table 2.2 shows the causes of injury-related deaths for Saskatchewan children and youth under 20 years of age. Motor vehicle traffic was responsible for 38% of injury-related deaths, self-injury for 17% and drowning or choking for 11%.

Table 2.2 Number of Deaths by Injury Cause for Saskatchewan Children and Youth Under 20 Years of Age, 1995 - 1999

Cause	Deaths
Assaults	17
Cycle	6
Drowning and Choking	45
Environmental	11
Fire and Flame	25
MV Pedestrian	26
MV Traffic	151
Poison	10
Self-Injury	68
Undetermined Intent	9
All Other Injury *	31
Total	399

* Other includes falls, MV-non traffic, other transport, sports, and struck or caught

The injury-related death rates per 100,000 population for children and youth under 20 years of age are shown in Figure 2.2. Males have higher rates than females in all age groups except for children under 1 year of age. Rates for males 15 to 19 years of age are over twice as high as the average.

Figure 2.2 Injury-Related Death Rates (per 100,000 population) by Age and Sex for Saskatchewan Children and Youth Under 20 Years of Age, 1995-1999

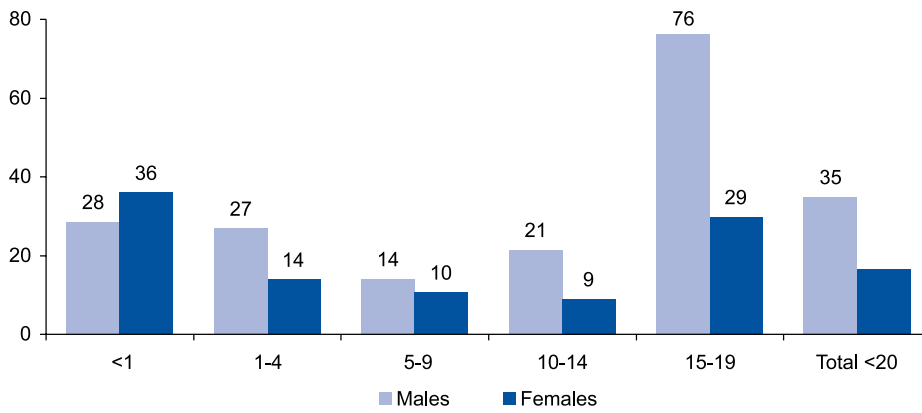
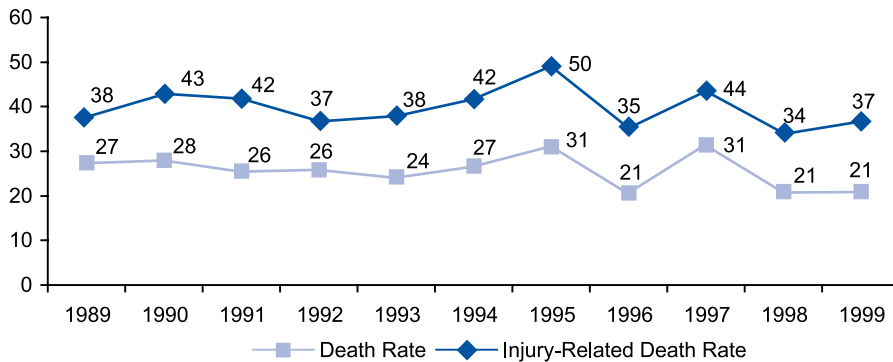


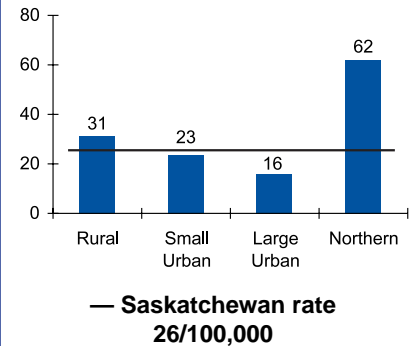
Figure 2.3 compares the age-standardized rates of total deaths and injury-related deaths for children and youth under 20 years of age from 1989 to 1999. Northern children have the highest rate of injury-related deaths per 100,000 population in Saskatchewan, as shown in Figure 2.4.

Figure 2.3 Age-Standardized * Rates of Total Deaths and Injury-Related Deaths (per 100,000 population) for Saskatchewan Children and Youth Between 1 and 19 Years of Age, 1989-1999



* Standard population is the 1989 covered population for Saskatchewan.

Figure 2.4 Injury-Related Death Rates (per 100,000 population) by Geographic Group for Saskatchewan Children and Youth Under 20 Years of Age, 1995-1999



Males 15-19 years of age have the highest rate of injury-related deaths



Leading Causes of Injury-Related Hospitalizations and Deaths for Saskatchewan Children and Youth Under 20 Years of Age

This section discusses injury-related hospitalizations and deaths for children and youth under 20 years of age in Saskatchewan from 1995 to 1999. Each of the top nine causes of injury-related hospitalizations and deaths is discussed through the types of injuries, rates over time and where the injuries occurred, as appropriate.

Hospitalization rates are presented for children and youth from four geographic groups, including rural, small urban, large urban, and northern. The cultural, socio-economic and environmental characteristics of these four groups vary widely. Each distinct group experiences varying rates of injury depending on the cause.

Each section includes some prevention tips that will help to decrease the occurrence of injury-related hospitalizations and deaths for children and youth in Saskatchewan.



Falls

This section discusses falls as a cause of injury hospitalizations, injuries sustained, and rates of injury-related hospitalizations for Saskatchewan children and youth under 20 years of age from 1995 to 1999.

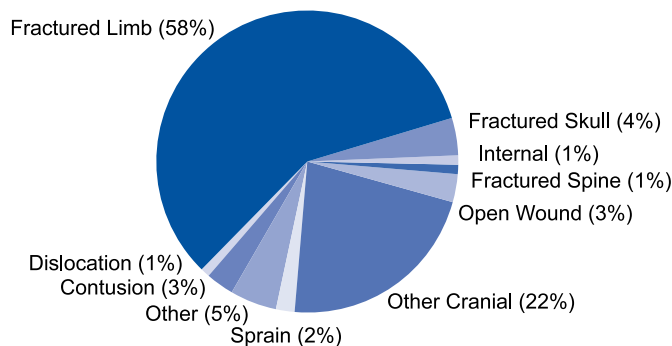
In Saskatchewan, as in other parts of Canada, falls are the leading cause of injury resulting in hospitalization (Health Canada, 1997). They were responsible for 25% of injury-related hospitalizations for Saskatchewan children and youth. Falls accounted for a small proportion of injuries that resulted in death, with a total of less than five. There were over 1,349 hospitalizations for every death.

More males than females were hospitalized due to falls in all age groups as shown in Table 3.1. In 5 to 9 year-old children, injuries caused by falls accounted for 49% of their total injuries.

Types of Injury

Figure 3.1 presents the distribution of fall-related injuries resulting in hospitalizations to Saskatchewan children and youth under 20 years of age. Fractured limbs accounted for 58% of the injuries. Other cranial, which includes concussions and cerebral lacerations, were diagnosed in 22% of hospitalizations.

Figure 3.1 Fall-Related Injuries Resulting in Hospitalization for Saskatchewan Children and Youth Under 20 Years of Age, 1995-1999 (n=4048)



* Other includes burns, blood vessel, late effects, nerves and spinal cord, superficial and poison.



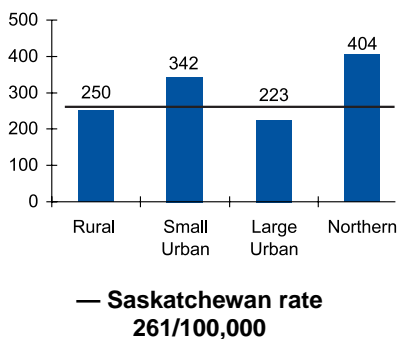
Table 3.1 Number of Fall-Related Hospitalizations for Saskatchewan Children and Youth Under 20 Years of Age, 1995-1999

	Male	Female	Total
Under 1	108	94	202
1-4	501	407	908
5-9	839	607	1446
10-14	603	348	951
15-19	338	203	541
Total	2389	1659	4048

Falls are the leading cause of injury resulting in hospitalization

23% of all fall-related hospitalized injuries occurred on the playground

Figure 3.2
Fall-Related Injury Hospitalization Rates (per 100,000 population) by Geographic Group for Saskatchewan Children and Youth Under 20 Years of Age, 1995-1999



The most common place for a fall to occur is in the home

Location Injuries Occurred

Falls in the home account for 32% of the falls in all age groups. Children under 1 year of age experienced 75% of their falls in the home. Children in this age group were most likely to fall from one level to another (61%), including, falling from tables, counters and furniture, and on stairs (30%).

In other age groups, the percentage of falls in the home decreases as the children get older while the percentage of falls during recreation and sports increases.

Playground Injuries

Playground safety is a continuing issue in child safety in Saskatchewan and Canada (Canadian Institute of Child Health, 2000). In Saskatchewan, twenty-three per cent of all fall-related hospitalized injuries occurred on the playground. Children 5 to 9 years of age were involved in the majority of playground injuries involving falls (64%). For all age groups, 74% of playground injuries resulted in a fractured limb, with a fracture of the arm being most common (64%). Other cranial injuries accounted for 15% of the total injuries, including 65 concussions.

Geographic Groups

Rates of injury-related hospitalizations per 100,000 population for each of the four geographic groups are shown in Figure 3.2. Children residing in northern Saskatchewan had the highest rate while children in small urban areas had the second-highest rate.

Prevention Tips

- Include safety programming in prenatal and parenting education, focusing on awareness of hazards in the home.
- Educate parents and communities on safe playgrounds and the need for supervision.
- Encourage and facilitate the use of gates to bar access to stairs to infants and toddlers.

Motor Vehicle Traffic

This section discusses motor vehicle traffic as a cause of injury-related deaths and hospitalizations, injuries sustained, and rates of injury hospitalizations for Saskatchewan children and youth under 20 years of age from 1995 to 1999.

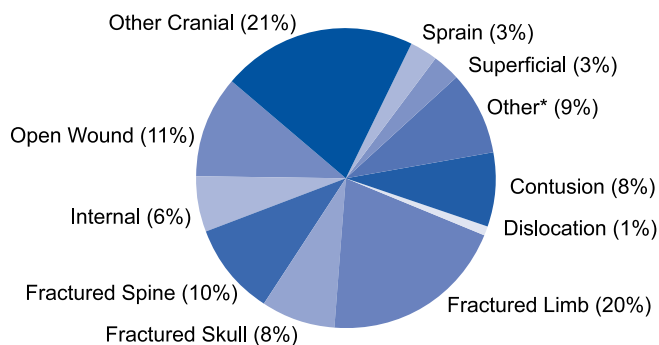
Motor vehicle traffic injuries are the leading cause of injury-related deaths and the third-highest cause of injury-related hospitalizations in children and youth under 20 years of age. Motor vehicle traffic injuries led to 141 deaths and 1,333 hospitalizations.

Tables 4.1 and 4.2 show that youth 15 to 19 years of age were most often affected by motor vehicle injury-related deaths (72%) and hospitalizations (72%). In this age group, 48% of injury-related deaths and 17% of injury-related hospitalizations were due to motor vehicle traffic injuries. This mortality percentage is higher than average in other areas of Canada (Health Canada, 1997).

Types of Injury

The distribution of motor vehicle traffic-related injuries resulting in hospitalization to Saskatchewan children and youth is shown in Figure 4.1. The two main types of injuries caused by motor vehicle traffic were other cranial (21%), including concussions and cerebral lacerations, and fractured limbs (20%).

Figure 4.1 Motor Vehicle Traffic-Related Injuries Resulting in Hospitalization for Saskatchewan Children and Youth Under 20 Years of Age, 1995-1999 (n=1333)



* Other includes burns, blood vessel, crushing, nerves and spinal cord, and poison.

Table 4.1 Number of Motor Vehicle Traffic-Related Hospitalizations for Saskatchewan Children and Youth Under 20 Years of Age, 1995-1999

	Male	Female	Total
Under 5	35	33	68
5-9	56	36	92
10-14	130	86	216
15-19	573	384	957
Total	794	539	1333

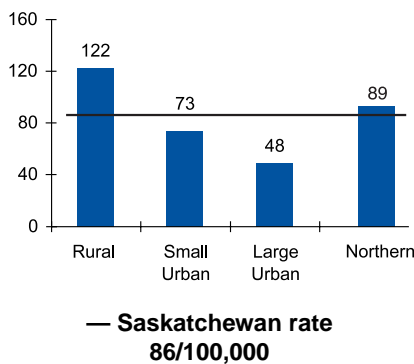


Table 4.2 Number of Motor Vehicle Traffic-Related Deaths for Saskatchewan Children and Youth Under 20 Years of Age, 1995-1999

	Male	Female	Total
Under 15	27	13	40
15-19	63	38	101
Total	90	51	141

Motor vehicle traffic injuries are the leading cause of injury-related death for children under 20 years of age

Figure 4.2
Motor Vehicle Traffic-Related Injury Hospitalization Rates (per 100,000 population) by Geographic Group for Saskatchewan Children and Youth Under 20 Years of Age, 1995-1999



Youth 15-19 account for 67% of motor vehicle traffic injury-related deaths and 72% of hospitalizations

Person Injured

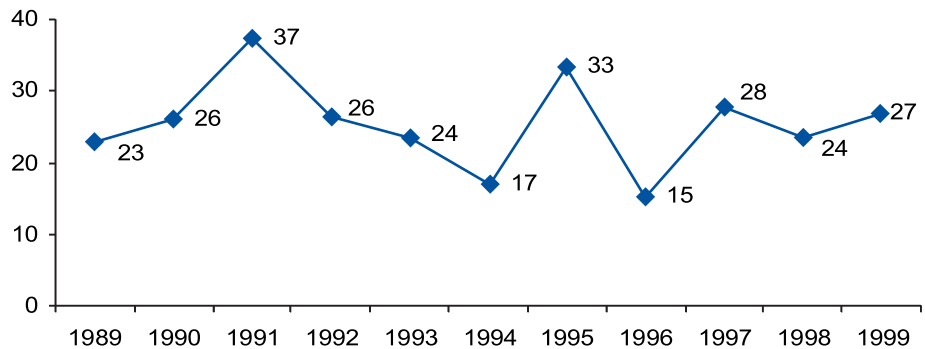
In 28% of the motor vehicle traffic-related hospitalizations for children and youth under 20 years of age, the person injured was between 15 and 19 years of age and was the driver of the vehicle.

Hospitalization and Death Rates

Rural children and youth have the highest rate of motor vehicle traffic injury hospitalizations per 100,000 population in Saskatchewan. Figure 4.2 also shows that children residing in large urban areas have the lowest rate.

As shown in Figure 4.3, the motor vehicle traffic injury-related death rates per 100,000 population for youth 15 to 19 years of age have fluctuated from 1989 to 1999. There has been a slight decrease in the death rates over time.

Figure 4.3 **Motor Vehicle Traffic-Related Death Rates (per 100,000 population) for Saskatchewan Youth 15 to 19 Years of Age, 1989-1999**



Prevention Tips

- Promote the use of proper child restraint systems, including car seats, boosters and seat belts, at the appropriate ages.
- Work to increase seat belt use among young drivers and to reduce the incidence of drinking and driving.
- Implement graduated drivers' license programs.

Self-Injury

This section discusses self-injury as a cause of injury-related hospitalizations and deaths, injuries sustained, and rates of injury-related hospitalizations and deaths for Saskatchewan children and youth under 20 years of age from 1995 to 1999.

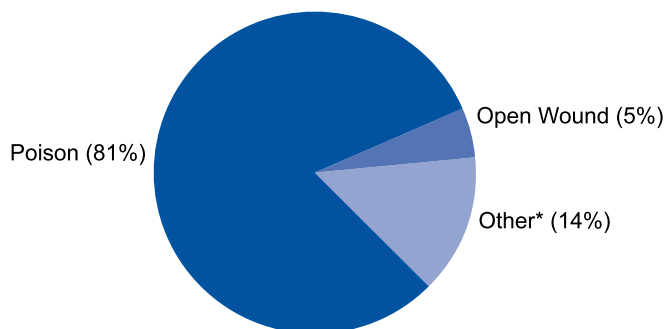
Self-injury is the second-highest cause of injury-related deaths for Saskatchewan children and youth under 20 years of age. It accounted for 17% of all injury-related deaths and 9% of all injury-related hospitalizations, a total of 68 deaths and 1,485 hospitalizations.

Hospitalizations caused by self-injury increase with age as shown in Table 5.1. Youth in the 15 to 19 age group accounted for 73% of the injury-related hospitalizations and 85% of the deaths. Children under 10 were rarely affected. In the 10 to 19 age group, females accounted for 74% of the injury-related hospitalizations and males accounted for 81% of the 67 self-injury related deaths.

Types of Injury

The distribution of self-injuries resulting in hospitalization for Saskatchewan youth 10-19 years of age is presented in Figure 5.1. Among injuries related to self-injury, poison was the leading cause, representing 81%. The only other significant type of injury was an open wound (5%).

Figure 5.1 Self-Injuries Resulting in Hospitalization for Saskatchewan Youth 10-19 Years of Age, 1995-1999 (n=1456)

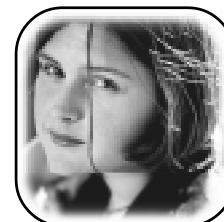


* Other includes burns, contusion, fractures, foreign object, internal, late effects, nerves and spinal cord, other cranial and superficial.

Table 5.1 Number of Self-Injury Hospitalizations for Saskatchewan Children and Youth 1 to 19 Years of Age, 1995-1999

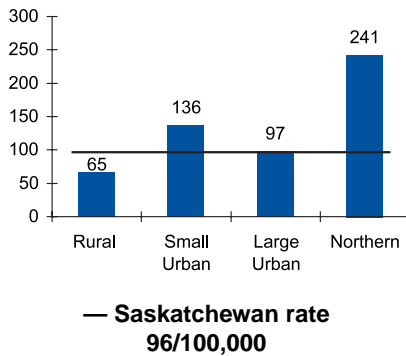
	Male	Female	Total
1-9	15	14	29
10-14	70	300	370
15-19	305	781	1086
Total	390	1095	1485

Self-injury is the second-highest cause of injury-related deaths for children and youth under 20 years of age



Females 10-19 years of age accounted for 74% of self-injuries resulting in hospitalization

Figure 5.2
Self-Injury Hospitalization Rates (per 100,000 population) by Geographic Group for Saskatchewan Youth 10-19 Years of Age, 1995-1999



Males 10-19 years of age accounted for 81% of the self-injuries resulting in death

Method of Self-Injury

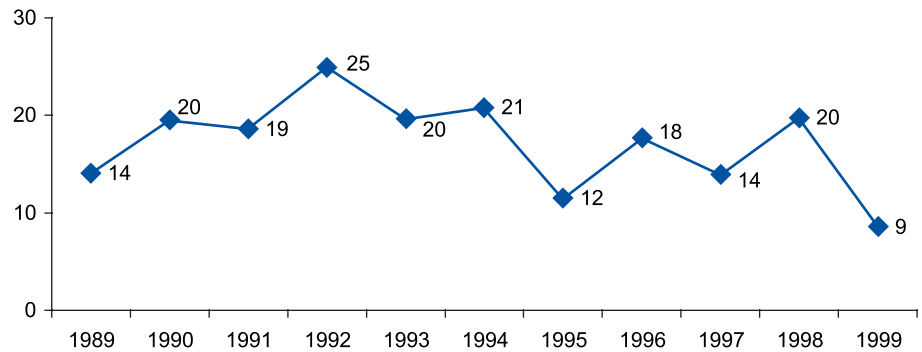
In the 10-19 age group, the most common methods of self-injury resulting in death were hanging (52%) and firearms (31%). For this age group, the most common method of self-injury resulting in hospitalization was poison (88%). The next most common was using cutting and piercing instruments (7%).

Hospitalization and Death Rates

The self-injury hospitalization rates per 100,000 population by geographic group for Saskatchewan youth 10 to 19 years of age are shown in Figure 5.2. Northern youth had the highest rates at 241 per 100,000 population which is common throughout Canada (Suicide Information and Education Centre, 1999).

Figure 5.3 shows the rate of self-injury deaths for youth 15 to 19 years of age. The rates have fluctuated over the 1989 to 1999 time period. There has been a general downward trend. Rates in Canada among 10 to 19 year-olds have remained steady or increased slightly from 1980 to 1996 (Herbert et al., 1999).

Figure 5.3 Self-Injury Death Rates (per 100,000 population) for Saskatchewan Youth 15 to 19 Years of Age, 1989-1999



Prevention Tips

- Increasing knowledge of how to recognize the warning signs of suicide, respond to the signs and seek support.
- Limiting access to firearms and lethal medicines.
- Encouraging supportive communities.

Drowning and Choking

This section discusses drowning and choking as a cause of injury-related hospitalizations and deaths, and rates of injury hospitalizations for Saskatchewan children and youth under 20 years of age from 1995 to 1999.

Drowning and choking are the third-highest cause of injury-related deaths for children and youth under 20 years of age. They are the leading injury-related cause of death for children under 1 and 5 to 9 years of age. They account for 11% of all injury-related deaths, a total of 45 deaths in children and youth under 20 years of age.

The younger age groups are the most affected by drowning and choking as shown in Table 6.1. Sixty-four per cent of all drowning and choking-related hospitalizations happened to children under 5 years of age and 76% of deaths occurred among children under 10 years of age. This trend is the same as in the rest of Canada (Health Canada, 1997).

Location and Cause

Fifty-two per cent of drowning and choking incidents that resulted in hospitalization happened in the home. Inhalation of a foreign body was the cause of 79% of choking-related hospitalizations while inhalation of food caused 15%.

Hospitalization Rates

The northern portion of the province had the highest drowning and choking hospitalization rates per 100,000 population for children and youth under 20 years of age, as shown in Figure 6.1.

Prevention Tips

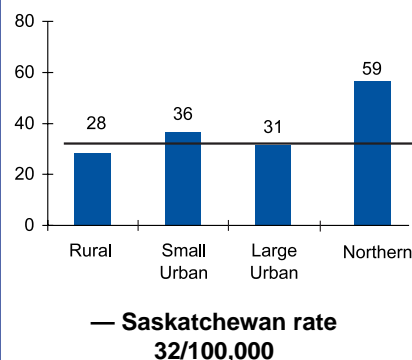
- Increase awareness of caregivers of the dangers in the home such as cribs, latex balloons, blind cords and drawstrings, firm foods, and toys with small parts.
- Encourage safe water behaviour and activities including the use of life jackets and appropriate supervision.
- Increase training in CPR and first aid for caregivers.

Table 6.1
Number of Drowning and Choking-Related Hospitalizations for Saskatchewan Children and Youth Under 20 Years of Age, 1995-1999

	Male	Female	Total
Under 1	43	42	85
1-4	124	109	233
5-9	55	45	100
10-14	36	13	49
15-19	22	7	29
Total	280	216	496



Figure 6.1
Drowning and Choking-Related Hospitalization Rates (per 100,000 population) by Geographic Group for Saskatchewan Children and Youth Under 20 Years of Age, 1995-1999



Fire and Flame

This section discusses fire and flame as a cause of injury-related hospitalizations and deaths, and rates of injury hospitalizations for Saskatchewan children and youth under 20 years of age from 1995 to 1999.

Fire and flame is the fifth-highest cause of injury-related deaths in children and youth under 20 years of age and the leading injury-related cause of death in children 1 to 4 years of age. Fire and flame injuries resulted in 171 hospitalizations and 25 deaths.

As shown in Table 7.1, fire and flame hospitalizations affect all age groups relatively equally; however, more males were hospitalized than females. Fire and flame injuries resulted in an average of 8 days of stay (DOS) per hospitalization, much higher than the average of 3.3 DOS for all injury-related hospitalizations.

Location and Injury Diagnosis

Fifty per cent of the fire and flame injuries resulting in hospitalization occurred in the home. Cooking-related fires are the largest cause of fires in the home (Fire Prevention Canada, 2000). The main injury diagnosis for fire and flame injuries was burns at 81% and poison (smoke inhalation) at 17%.

Hospitalization Rates

Fire and flame hospitalization rates per 100,000 population were highest for the northern geographic group, almost double the second-highest. This is shown in Figure 7.1.

Prevention Tips

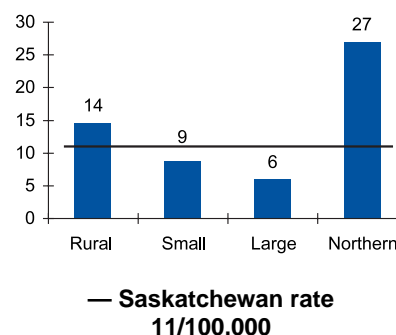
- Promote need for smoke alarms and to develop and practice a fire escape plan.
- Educate on how to avoid and deal with cooking-related fires.
- Emphasize need to keep lighters, matches and candles away from children.

Table 7.1
Number of Fire and Flame-Related Hospitalizations for Saskatchewan Children and Youth Under 20 Years of Age, 1995-1999

	Male	Female	Total
Under 5	25	17	42
4-9	27	12	39
10-14	38	4	42
15-19	41	7	48
Total	131	40	171

Fire and flame injures are the leading cause of injury-related deaths in children 1-4 years of age

Figure 7.1
Fire and Flame-Related Hospitalization Rates (per 100,000 population) by Geographic Group for Saskatchewan Children and Youth Under 20 Years of Age, 1995-1999



Poison

This section discusses unintentional poisoning as a cause of injury-related hospitalizations and deaths, and rates of injury hospitalizations for Saskatchewan children and youth under 20 years of age from 1995 to 1999.

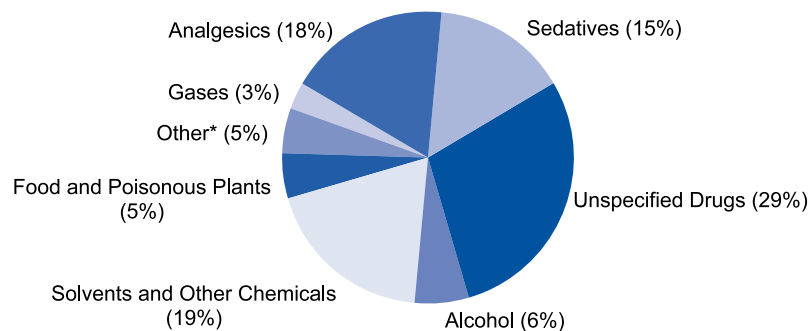
Poison is the second-highest cause of injury-related hospitalizations for children 1 to 4 years of age. Poison-related injuries resulted in 10 deaths during the 1995 to 1999 time period and 1,136 hospitalizations.

Children 1 to 4 years of age accounted for 71% of all hospitalizations due to poison. Table 8.1 also shows that more males than females are affected. Hospitalizations due to poisoning increased with age. Youth 10 to 19 years of age accounted for 90% of all deaths. These trends are all evident in Canada as well (Health Canada, 1997).

Types of Poison

The types of poisons that resulted in hospitalizations for children and youth under 20 years of age are identified in Figure 8.1. The main identified poisons were solvents and other chemicals (19%), analgesics (18%) and sedatives (15%). Unspecified drugs accounted for 29%.

Figure 8.1 Types of Poison Causing Hospitalization for Saskatchewan Children and Youth Under 20 Years of Age, 1995-1999 (n=1136)



* Other includes antibiotics and anti-infectives.



Table 8.1 Number of Poison-Related Hospitalizations for Saskatchewan Children and Youth Under 20 Years of Age, 1995-1999

	Male	Female	Total
Under 1	35	29	64
1-4	445	363	808
5-9	48	36	84
10-14	36	34	70
15-19	56	54	110
Total	620	516	1136

Poison is the second-highest cause of injury-related hospitalizations for children 1-4 years of age



Sixty-nine per cent of poisonings resulting in hospitalization occurred in the home

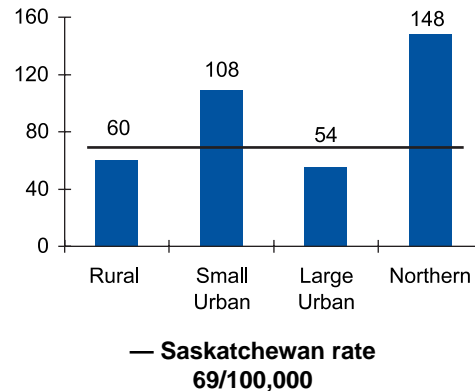
Place of Poisoning

Sixty-nine per cent of all poisonings resulting in hospitalization occurred in the home. The percentage of children and youth who experience poisoning in the home decreases as they get older. For children under 1 year of age, 81% of poisonings were at home. Only 39% of poisonings for youth 15 to 19 years of age occurred in the home.

Hospitalization Rates

The poison-related hospitalization rates per 100,000 population by geographic group for Saskatchewan children and youth are shown in Figure 8.2. The northern geographic group has the highest rate, 148 per 100,000 population, more than twice the provincial average of 69.

Figure 8.2 Poison-Related Hospitalization Rates (per 100,000 population) by Geographic Group for Saskatchewan Children and Youth Under 20 Years of Age



Prevention Tips:

- Educate parents on possible poisons in the home such as medicines, cleaning products, pesticides, products that contain alcohol, certain plants, cosmetics, soap, and detergents.
- Educate on ways to deal with poisons that are in the home such as properly labelling and keeping them out of the reach of children and in a locked cabinet.
- Promote the Saskatchewan Poison Centre toll-free line (1-866-454-1212).

Motor Vehicle Pedestrian

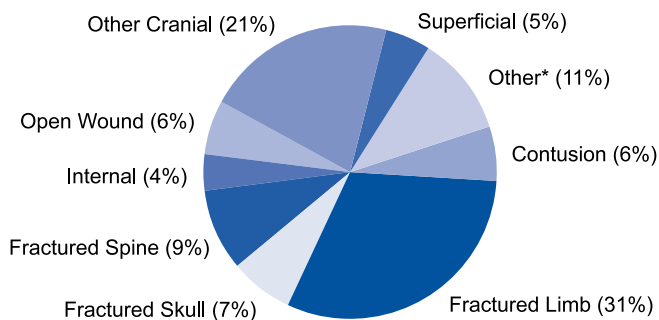
This section discusses injuries to pedestrians caused by motor vehicles resulting in hospitalizations and deaths, and rates of injury hospitalizations for Saskatchewan children and youth under 20 years of age from 1995 to 1999.

Injuries to pedestrians caused by motor vehicles resulted in 314 hospitalizations and 26 deaths in the 1995 to 1999 time period. More males than females were affected, as shown in Table 9.1. All age groups were affected relatively equally.

Injury Diagnosis and Hospitalization Rates

Motor vehicle pedestrian injury hospitalization rates per 100,000 population are highest for the northern geographic group, at more than double the second-highest. This is shown in Figure 9.1. The main injury diagnoses for a pedestrian injured by a motor vehicle were fractured limbs (31%) and other cranial (21%). The distribution of diagnoses is shown in Figure 9.2.

Figure 9.2 Motor Vehicle Pedestrian-Related Injuries Resulting in Hospitalization for Saskatchewan Children and Youth Under 20 Years of Age, 1995-1999 (n=314)



* Other includes blood vessel, crushing, dislocation, nerves and spinal cord, and sprain.

Prevention Tips

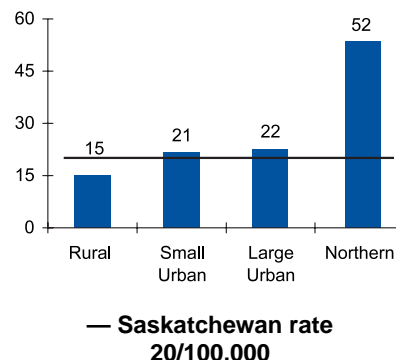
- Implement pedestrian training programs in schools.
- Increase awareness of school area safety for pedestrians.

Table 9.1 Number of Motor Vehicle Pedestrian-Related Hospitalizations for Saskatchewan Children and Youth Under 20 Years of Age, 1995-1999

	Male	Female	Total
1-4	48	32	80
5-9	56	36	92
10-14	36	33	69
15-19	43	30	73
Total	183	131	314

Injuries to pedestrians caused by motor vehicles resulted in 314 hospitalizations and 26 deaths

Figure 9.1 Motor Vehicle Pedestrian-Related Injury Hospitalization Rates (per 100,000 population) by Geographic Group for Saskatchewan Children and Youth Under 20 Years of Age, 1995-1999



Sports

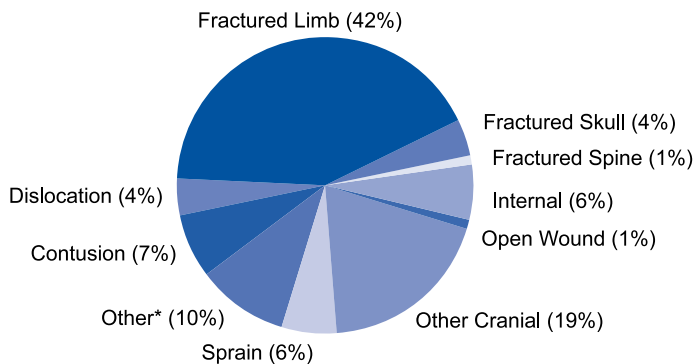
This section discusses sports injuries resulting in hospitalizations and deaths, and rates of injury hospitalizations for Saskatchewan children and youth under 20 years of age from 1995 to 1999.

Sports-related injuries are the third-highest cause of injury-related hospitalizations in youth 10 to 19 years of age. Sports injuries caused less than five deaths during this time period. Table 10.1 shows that youth 10 to 19 years of age account for 93% of hospitalizations and in all age groups; males are most likely to be affected, accounting for 86% of the hospitalizations.

Injury Diagnosis and Hospitalization Rates

Sports-related injury hospitalization rates per 100,000 population are highest for the rural geographic group, while the northern group is the lowest, as shown in Figure 10.1. Children and youth experiencing a sports injury are most likely to be diagnosed with a fractured limb. The distribution of diagnoses is shown in Figure 10.2.

Figure 10.2 Sports-Related Injuries Resulting in Hospitalization for Saskatchewan Children and Youth Under 20 Years of Age, 1995-1999 (n=1107)



* Other includes blood vessel, crushing, nerves and spinal cord, and superficial.

Prevention Tips

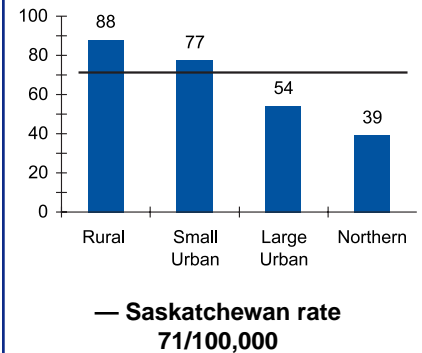
- Insure adequate supervision for all organized activities.
- Increase knowledge and use of proper protective gear and safety rules to be followed during sports activities for children, youth, coaches, and parents.

Table 10.1 Number of Sports-Related Hospitalizations for Saskatchewan Children and Youth Under 20 Years of Age, 1995-1999

	Male	Female	Total
1-4	6	3	9
5-9	59	15	74
10-14	407	69	476
15-19	479	69	548
Total	951	156	1107

Males between 10 and 19 years of age account for 80% of sport injury-related hospitalizations

Figure 10.1 Sports-Related Hospitalization Rates (per 100,000 population) by Geographic Group for Saskatchewan Children and Youth Under 20 Years of Age, 1995-1999



Assaults

This section discusses assaults as a cause of injury-related hospitalizations and deaths, and rates of injury hospitalizations for Saskatchewan children and youth under 20 years of age from 1995 to 1999.

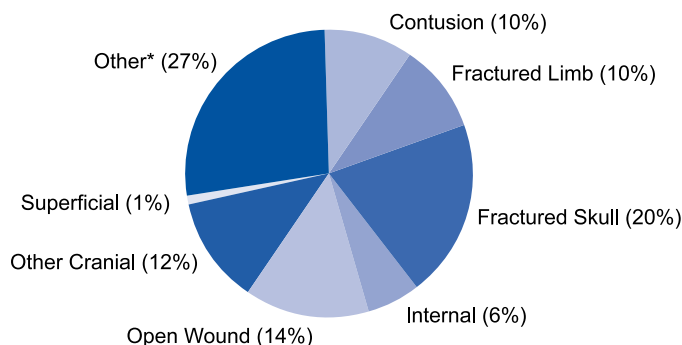
Assaults are the third-highest cause of injury-related deaths for youth 15 to 19 years of age. There were a total of 17 deaths caused by assaults and 43 hospitalizations for every death.

Males were 2.5 times more likely to experience assault resulting in hospitalization than females. As shown in Table 11.1, males 15 to 19 years of age accounted for 51% of all assault-related injuries causing hospitalization. Youth 15 to 19 years of age accounted for 59% of all assault-related deaths, and the rest were evenly spread over the other age groups.

Injury Diagnosis

Figure 11.1 shows the distribution of assault injuries for Saskatchewan children and youth. The main diagnoses included fractured skull (20%), open wound (14%), and other cranial (12%).

Figure 11.1 Assault-Related Injuries Resulting in Hospitalization for Saskatchewan Children and Youth Under 20 Years of Age, 1995-1999 (n=731)



* Other includes burns, blood vessel, dislocation, fractured spine, late effects, nerves and spinal cord, poison, and sprain.

Table 11.1 Number of Hospitalizations Due to Assaults For Saskatchewan Children and Youth Under 20 Years of Age, 1995-1999

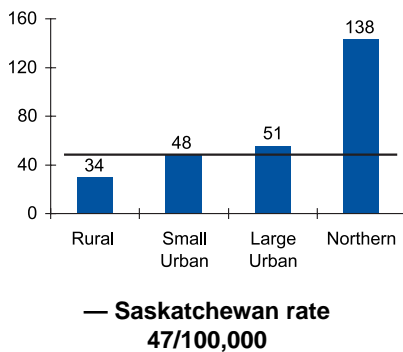
	Male	Female	Total
Under 1	33	13	46
1-4	48	26	74
5-9	16	19	35
10-14	59	36	95
15-19	371	110	481
Total	527	204	731

Males 15-19 years of age account for 51% of all assault-related injuries resulting in hospitalization



The most common assault for children under 10 years of age is child battering and other maltreatment

Figure 11.3
Assault-Related Hospitalization Rates (per 100,000 population) by Geographic Group for Saskatchewan Children and Youth Under 20 Years of Age, 1995-1999

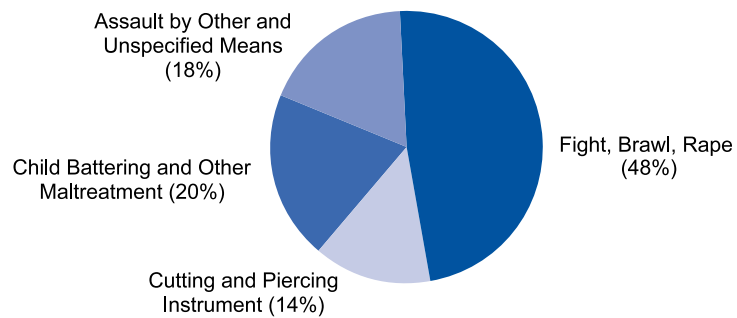


For youth 10-19 years of age, the most common assault is fight, brawl and rape

Type of Assault

There are three main types of assaults shown in Figure 11.2: fight, brawl or rape (48%); child battering and other maltreatment (20%); and cutting and piercing instrument (14%). For children under 10 years of age, the most common assault was child battering and other maltreatment (81%). For youth in the 10 to 19 age group the most common assault was fight, brawl or rape (60%).

Figure 11.2 Types of Assaults Resulting in Hospitalization for Saskatchewan Children and Youth Under 20 Years of Age, 1995-1999 (n=731)



* Other includes poisoning, hanging and strangulation and late effects.

Hospitalization Rates

The assault-related hospitalization rates per 100,000 population by geographic group for Saskatchewan children and youth are shown in Figure 11.3. The northern geographic group had the highest rate, 148 per 100,000 population, more than 2.5 times as high as the next rate of 51 per 100,000 population for children and youth living in a large urban setting.

Prevention Tips

- Provide education and support for parents to enable them to raise their children safely.
- Encourage programming that teaches skill-building for determining peaceful solutions to conflicts.

References

Barss, P, GS Smith, SP Baker, and D Mohan. 1998. *Injury Prevention: An International Perspective: Epidemiology, Surveillance, and Policy*. New York: Oxford University Press.

Brownell, M, P Martens, A Kozyrskyj, P Fergusson, J Lerfald, T Mayer, S Derksen, and D Friesen. 2001. *Assessing The Health of Children in Manitoba: A Population-Based Study*. Winnipeg: Manitoba Centre for Health Policy and Evaluation.

Canadian Institute of Child Health (CICH). 2000. *The Health of Canada's Children*, Third Edition. Ottawa: CICH.

Davis, RM and B Pless. 2001. BMJ bans "accidents." *BMJ*. Volume 322, 2 June:1320-1321.

Fire Prevention Canada. 2000. Media Release, Fire Prevention Week – October 8-14, 2000. Ottawa: Fire Prevention Canada.

Guyer, B and SS Gallagher. 1985. An Approach to the Epidemiology of Childhood Injuries. *Pediatric Clinics of North America*. 32:5-16.

Hader, JM and Seliske, P. 1993. *Injuries in Saskatchewan*. Saskatoon: Health Status Research Unit, University of Saskatchewan.

Harlos, S, L Barda, N Buchan, TP Klassen, VL Koop, and ME Moffatt. 1999. Urban and Rural Patterns of Bicycle Helmet Use: Factors Predicting Usage. *Injury Prevention*. September; 5(3):183-188.

Health Canada. 1997. *For the Safety of Canadian Children and Youth: From Injury Data to Preventive Measures*. Ottawa: Minister of Public Works and Government Services Canada.

Herbert M, T Lipske, S Mackenzie, and ID Rusen. 1999. *Measuring Up: A Health Surveillance Update on Canadian Children and Youth*. Ottawa: Health Canada, Health Protection Branch – Laboratory Centre for Disease Control (http://www.hc-sc.gc.ca/hpb/lcdc/brch/measuring/mu_v_e.html).

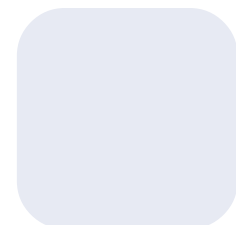
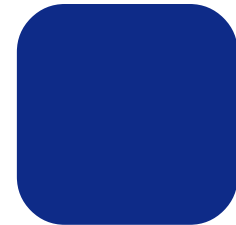
International Classification of Diseases (ICD9). 1977. Geneva: World Health Organization.

MacMillan, H, AB MacMillan, DR Offord, JL Dingle. 1996. Aboriginal Health. *Canadian Medical Association Journal*. Dec. 1;155(11):1569-1578.

SmartRisk. 2001. *The Economic Burden of Unintentional Injury in Saskatchewan*. Toronto.

Suicide Information & Education Centre (SIEC). 1999. *Suicide in Canada: Facing the Facts*, 3rd Edition. Calgary: SIEC, A Program of the Canadian Mental Health Association.

United Nations Children's Fund (UNICEF). 2001. A League Table of Child Deaths by Injury in Rich Nations. *Innocenti Report Card*. No. 2. Florence: Innocenti Research Centre (www.unicef-icdc.org).



Appendix: Methodology



Methodology

Data Sources

Hospitalization data for this report were received from Research Services of the Epidemiology Research and Evaluation Unit in the Population Health Branch of Saskatchewan Health. Death data were provided by the Vital Statistics Branch of Saskatchewan Health, and the covered population data by Health Insurance Registration, Saskatchewan Health.

The data used in the report consist of:

- All injury-related hospital separations within Saskatchewan for persons under 20 years of age for the years 1996 to 1999, with the External Cause code (E-code) between E800 and E999. Misadventures to Patients During Surgical and Medical Care (codes E870 to E879) were excluded, as these are injuries that occur in hospital during medical treatment and are not appropriately addressed through community prevention strategies.
- All injury-related deaths of Saskatchewan residents under 20 years of age, with the E-Code between E800 and E899. Deaths attributable to Misadventures to Patients During Surgical and Medical Care were excluded from the analysis.
- Total counts for the population under 20 years of age for the years 1996 to 1999, by age, sex and Residence Code (ResCode). The ResCode number was used to group the data into the four geographic groups (rural, small urban centres, large urban centres, and northern Saskatchewan) used in this report.

For each hospitalization record, the following information was received: birth date, sex, dates of hospitalization, ResCode based on postal code of residence, ResCode based on community where registered, length of hospital stay in days, primary, secondary and other diagnoses, and E-code. Death records included the underlying cause of death and injury code.

Terms Used in the Report

ICD9 Codes

Cause of death and hospital diagnosis are coded by Saskatchewan hospitals and Saskatchewan Vital Statistics according to the International Classification of Diseases 9th Revision (ICD9, 1977). The ICD9 uses a series of codes to identify diagnoses and causes of death. These codes were combined into cause-specific categories and types of injury for the purposes of this report.

External Cause of Injury

The causes of injury were defined using the E-codes of the ICD9. E-codes are five-digit codes that describe external causes of hospitalization and death. The first three digits indicate the external cause: for example, E884 is a fall from one level to another. The fourth and fifth digits provide more detail about the type of cause and place of occurrence: for example, E884.04 is a fall from playground equipment that occurred at a place of recreation and sport. The fourth and fifth digits are not always included in the data, but were used when applicable in the report. The description and related E-codes for each cause are shown in Figure A.1.

Types of Injury

Types of injury were coded using the ICD9 system. ICD9 codes between 800 and 999 represent diagnoses resulting exclusively from external causes (injuries). For example, ICD9 code 927 is a crushing injury of the upper limb, and code 927.1 is a crushing injury of the elbow and forearm. The type of injury was identified using the primary, secondary or tertiary diagnosis. The categories of sustained injuries (types of injury) and related ICD9 codes are shown in Figure A.2.

Rates

A rate is the measure of frequency of an event for a defined population. As an example, if 5 children under 5 years of age died during the year 1999, and the total number of children under 5 years of age in the population in 1999 was 12,500, the death rate per 100,000 population is calculated as follows: $(5/12,500) \times 100,000 = 40.0$ deaths per 100,000 children for that time period. Rates in this report are calculated for the total population of children during the five years of the study, 1996 through 1999. Rates are presented for 100,000 population for that time period.

Days of Stay (DOS)

For each hospitalization, the length of stay in a hospital is calculated and shown as days of stay (DOS). The average length of stay in days is shown for causes of injury-related hospitalizations and for types of injuries sustained.

Categories Used in the Report

Age Groups

In this report, the data are presented for all Saskatchewan children and youth according to age groups: under 1 year of age, 1 to 4 years of age, 5 to 9 years of age, 10 to 14 years of age, and 15 to 19 years of age. Data are presented for males and females, and for all children and youth in each age group.

Geographic Groups

Four mutually exclusive groups were identified for analysis to provide insight into geographic differences in injuries to Saskatchewan children and youth. These groups were chosen in order to provide more detailed information to Saskatchewan communities that are developing initiatives to address specific causes of injury to children and youth within their jurisdictions. Saskatchewan Health maintains data that support the use of these categories.

Evidence from Canadian and international literature shows that each of the identified geographic groups has experienced varying patterns and rates of injury hospitalization and death. Knowledge about the risk factors and the varying types and rates of injuries for children and youth from each of these groups will enhance understanding and support injury prevention efforts (see, for example, Brownell et al., 2001:101-115; Barss et al., 1998: 97-98; MacMillan et al., 1996; Harlos et al., 1999).

The four geographic groups are defined as follows, using the Residence Code (ResCode) that corresponds with the Postal Code of the residence of the child at the time of death or hospitalization:

Rural: communities and areas with populations less than 10,000 and located south of the two northern health districts and one authority.

Small urban centres: urban places with populations between 10,000 and 100,000 (Estevan, Lloydminster, Melfort, Moose Jaw, North Battleford, Prince Albert, Swift Current, Weyburn, and Yorkton).

Large urban centres: urban places with populations over 100,000 (Regina and Saskatoon).

Northern: communities and areas with populations less than 10,000 and located in the two northern health districts (Mamawetan Churchill River and Keewatin Yatthé) and the Athabasca Health Authority.

Limitations

This report includes only the most serious of injuries, those involving death and hospitalization. It has been estimated that for each death of a child, there are 40 hospitalizations and 670 emergency room visits (Herbert et al., 1999). Injuries treated at home are estimated to be twice the number treated in emergency rooms (Guyer and Gallagher, 1985). Data for visits to emergency rooms and physician offices are unavailable.

The data used in the report include deaths and hospitalizations of children and youth where the underlying cause is injury. The source of data on deaths is Saskatchewan Health, Vital Statistics. Hospitalization data presented in the report include all hospital discharge/separations where an injury code appears in the record. Hospitalization data were received from Population Health Branch, Saskatchewan

Health. It must be noted that the unit of analysis is the hospitalization and not the individual.

Data for this study are subject to the limitations inherent in administrative data, which are routinely collected for purposes other than research. Large-scale data sets are widely utilized for epidemiological studies in injury and other health issues. Hader and Seliske (1993) provide a discussion of the accuracy and validity of these data bases.

A child might be hospitalized on several different occasions for continuing care for an injury. If a child is injured and admitted to one hospital and then transferred to another hospital there will be two separation records and the number of hospitalizations for that one injury case will be two. Numbers and rates using separation records in these circumstances will overstate the actual number of injuries.

Because individual confidentiality must be protected, Saskatchewan Health requires that data in tables not be shown where the number of cases is between 1 and 4. In such cases, an asterisk (*) is inserted into the table.

The rates of hospitalization as well as the death rates for the northern geographic group should be used with caution since they are derived from small number of events and small reference population sizes, which tend to result in high unstable rates. (William Osei, Personal Communication, 2002.)

Figure A.1 Cause of Injury, Description and ICD9 E-Codes

Cause	Description	ICD9 E-Codes
Adverse effects of drugs	Correct drugs properly administered causing adverse effects	E930 to E949
Assaults	Fights, brawls, rape, and assaults by poisoning, strangulation, firearms, cutting instruments, etc.	E960 to E969
Cut by sharp object	Unintentional cuts from tools, appliances, implements, knives, broken glass, etc.	E920
Cycle	Riders of pedal cycles injured in collision with motor vehicles or falls from bicycles	All E826; and E812 to E814, E821, E822, E825 with 4 th digit 6
Drowning and choking	Unintentional drowning or suffocation; obstructions of food or other objects in respiratory tract or other orifices	E910 to E915
Environmental	Includes excessive heat or cold, changes in air pressure, animal attacks and poisoning by animals or plants, hunger, thirst, and neglect	E900 to E909
Falls	Falls from stairs, beds, chairs, ladders, buildings, playground equipment, and into holes, etc.	E880 to E888 excludes E886.0
Fire and flame	Private dwelling, other building, ignition of flammable material or clothes	E890 to E899
Hot or caustic substances	Hot liquids (water), steam or corrosive substances such as acid or ammonia	E924
MV non-traffic	Occurs off public highways and streets; includes snow vehicles, off-road vehicles, motor vehicles, and collisions that are off public highways	E820 to E825 excludes 4th digits 6 and 7
MV pedestrian	Any person injured by a motor vehicle who was not riding in or on any motor vehicle, bicycle or animal	E814 excluding 4th digit 6; and E810 to E825 with 4th digit 7
MV traffic	Involves a motor vehicle on a public highway or street but does not include bicycles or pedestrian	E810 to E813, E815 to E819 but excludes 4th digits 6 and 7
Other transport	Railway injuries, watercraft, water skiing, animal riding, vehicles not elsewhere classifiable	E801, E804, E805, E827 to E848
Overexertion	Excessive physical exercise, lifting, pulling, pushing, strenuous movements in recreational activities	E927
Poison	Unintentional poisoning by drugs or other solid and liquid substances, gases and vapours	E850 to E858 E860 to E869
Self-injury	Suicide and self-inflicted injury by poisoning, hanging, firearms, cutting and piercing, and other means	E950 to E959
Sports	Struck by or collision with person or object in football, boxing, hockey, baseball, or other sports	E917 and E886 with 4th digit 0
Struck or caught	Unintentionally struck by object or person or caught in or between objects (not machinery or vehicles)	All E916, all E918; and E917 excluding 4th digit 0
Undetermined – inten/unintentional	Injury undetermined whether intentional or unintentional	E980 to E989
All other injury	Injury by machinery, explosion, unintentional firearm, electricity, late effects of other injuries, other unspecified causes	E919, E921 to E923, E925, E926, E928, E929, E975, and E995

Figure A.2 Sustained Injury, Description and ICD9 Codes

Sustained Injury	Description	ICD9 Codes
Burns	Burns to face, neck, trunk, limbs, internal organs	940 to 949
Blood Vessel	Injury to blood vessels	900 to 904
Contusion	Bruise and haematoma of face, neck, trunk, limbs, etc.	920 to 924
Crushing	Crushing of face, neck, trunk, limbs, etc.	925 to 929
Dislocation	Dislocation of jaw, elbow, knee, shoulder, etc.	830 to 839
Foreign Object	Effects of foreign bodies entering through orifice (eye, ear, nose, respiratory tract, etc.)	930 to 939
Fractured Limb	Fracture of parts of upper or lower limb	810 to 829
Fractured Skull	Fracture of skull or face bones	800 to 804
Fractured Spine	Fracture of vertebral column, ribs, sternum, pelvis, or other trunk area	805 to 809
Internal	Internal injury to chest, abdomen and pelvis	860 to 869
Late Effects	Late effects of injuries, poisonings or other external causes	905 to 909
Nerves and Spinal Cord	Injury to nerves (optic, cranial, trunk, etc.)	950 to 957
Open Wound	Any open wound to head, neck and trunk of body	870 to 899
Other Cranial	Concussion, cerebral lacerations, haemorrhages	850 to 854
Poison	Poisoning by drugs, medicaments, toxic non-medicinal substances	960 to 989
Sprain	Sprains and strains of shoulders, arms, hips, thighs, etc.	840 to 848
Superficial	Superficial injuries to face, neck, trunk, limbs, etc.	910 to 919
Other Injuries	Other and unspecified effects of external causes and non-injury related primary diagnoses	990 to 995, 958, 959, and all ICD9 less than 800

