

UNINTENTIONAL INJURIES
IN BRITISH COLUMBIA:
TRENDS AND PATTERNS AMONG
ADULTS AND SENIORS 1987-1998,
Executive Summary

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2001

The British Columbia Injury Research and Prevention Unit (BCIRPU) directed by Dr. Parminder Raina, was established by the Minister of Health and the Minister's Injury Prevention Advisory Committee in August 1997. BCIRPU opened its doors in January 1998. It is housed within the Centre for Community Health & Health Evaluation Research (CCHHER) at Children's & Women's Health Centre of British Columbia and supported by the BC Research Institute for Children's & Women's Health. The primary purpose of the unit includes "The reduction of unintentional injuries among children and youth in BC through the support and evaluation of effective prevention measures, and the establishment of ongoing injury surveillance across the province."

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INTRODUCTION

Injuries among adults and seniors are responsible for a high number of deaths and hospitalizations, as well as a reduced quality of life and productivity losses. In 1994, the average potential years of life lost due to injuries was 36.4 years in BC, compared to 10.5 years for those who died of coronary and circulatory diseases, and 12.6 years for those who died of cancer (BC Ministry of Health, 1994). A Canadian study indicates that, in 1994, unintentional injuries alone were responsible for 3,472 deaths among Canadians aged 21 years and over, and that about 66% of these deaths (2,287 deaths) occurred among Canadians over 70 years of age alone (Angus et al., 1998). In 1995, among Canadians aged 25-34 years old, unintentional injuries were responsible for 30% of all deaths among males and 21% among females (Health Canada, 1999). Moreover, death rates due to unintentional injuries increase exponentially with age. In 1995, death rates among Canadians aged 25-64 years old were 24 per 100,000, 39 per 100,000 among the 65-74 year olds, 104 per 100,000 among the 75-84 year olds, and 401 per 100,000 among seniors 85 years and older (Health Canada, 1999). According to a recent literature review, motor vehicle crashes are the second leading contributor to the use of medical and hospital services in Canada (Raina, Torrance and Lindsay, 1997). Falls are responsible for about two-thirds of all injury-related hospitalizations and more than 70% of injury-related days of hospital care (Raina, Torrance and Lindsay, 1997). Among seniors, falls are responsible for more than half of all deaths of Canadians over age 65 (Raina, Torrance and Lindsay, 1997).

From 1987 to 1998, there were a total of 13,767 deaths due to unintentional injuries among adults and seniors in BC.

PURPOSE OF THIS REPORT

This report is a summary of the key findings of our analysis of unintentional injuries occurring among adults and seniors in BC between 1987 and 1998. Based on mortality and hospitalization data, this report will summarize these patterns by age, gender, region, year, and place of occurrence of injury events. A detailed report, which includes a more comprehensive analysis, is available. For further information or to request this document, please complete the order form at the end of this summary report.

INJURY MORTALITY BY AGE AND GENDER

From 1987 to 1998, there were a total of 13,767 deaths due to unintentional injuries among adults and seniors in BC. Mortality due to unintentional injuries showed higher rates among seniors aged 75 years and over than among younger age groups. While this pattern was consistent for both genders, gender differences were observed across age groups. Up to age 74, mortality rates were higher among males than females. Over age 74, there was no difference between males and females.

Up to age 74, mortality rates were higher among males than females. Over age 74, there was no difference by gender.

Average Annual Age-Specific Mortality Rates per 100,000 and Number of Deaths, B.C., 1987-1998

Age group	Male		Female	
	Total # of Deaths 1987-1998	Rate	Total # of Deaths 1987-1998	Rate
25-34	2389	55.50	594	14.20
35-44	2183	54.01	582	14.62
45-64	2150	42.63	736	14.87
65-74	739	45.08	486	25.31
75-79	436	85.19	391	55.10
80+	1259	254.77	1822	209.16
25+	9156	57.10	4611	27.75

LEADING CAUSES OF INJURY MORTALITY

The leading causes of death were different across age groups. Up to age 64, leading causes of injury deaths included Motor Vehicle Traffic and Poisoning. Over age 64, Falls and Motor Vehicle Traffic were the first

leading causes of death by injury. Drowning was a leading cause, especially in younger age groups (up to 74 year olds), while Poisoning was a leading cause of death among adults and seniors up to 79 years old. Suffocation was the third leading cause of death among the 75 year olds and over. Finally, Fire was the fifth leading

Rank of Leading Causes of Injury Mortality Among Adults & Seniors

Categories or External Cause of Injury	25-34	35-44	45-64	65-74	75-79	80+
Motor Vehicle Traffic*	1	2	1	2	2	2
Other/Unspecified Transport	4	5				
Falls	5	4	3	1	1	1
Fire, Flames and Hot Substances			5	5	5	4
Drowning and Submersion	3	3	4	4		
Poisoning	2	1	2	3	4	
Adverse Effects						5
Suffocation					3	3

*Motor Vehicle Traffic includes MV - Occupant, Pedal Cycle Rider, Pedestrian, Motorcyclist

cause of death among those aged 45-79 years.

Up to age 64, leading causes of injury deaths included Motor Vehicle Traffic and Poisoning. Over age 64, Falls and Motor Vehicle Traffic were the first leading causes of death by injury.

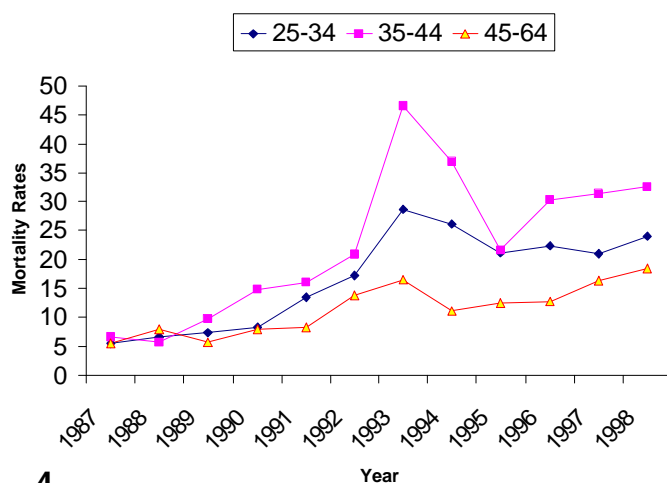
TIME TRENDS IN INJURY MORTALITY

The overall trends in mortality were generally steady across the 12-year period. With the exception of Poisoning, all the leading causes were maintained at approximately the same rates across the years.

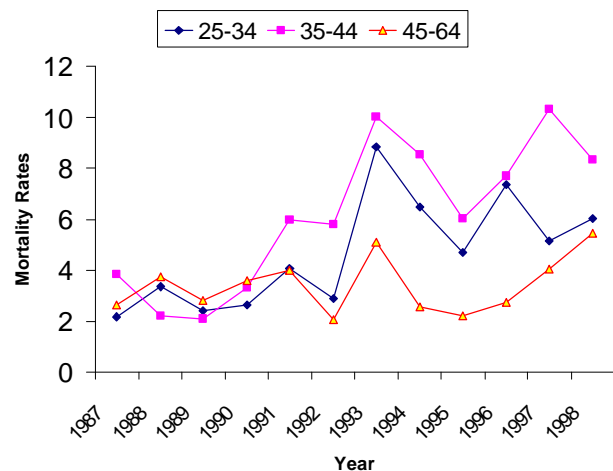
With the exception of Poisoning, all leading causes maintained approximately the same rates across the 12 years.

Up to age 64, increasing trends were observed for Poisoning deaths for both males and females. Rates of Falls as causes of death were steadily maintained at high levels among those aged 75 years and older. Finally, there was no change in the trends of Motor Vehicle Traffic and Suffocation injuries among seniors aged 80 years and older.

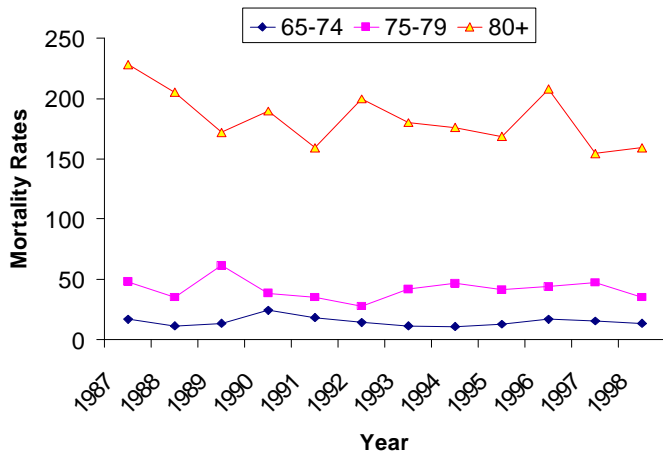
Average Annual Mortality Rates per 100 000, Poisoning, Males



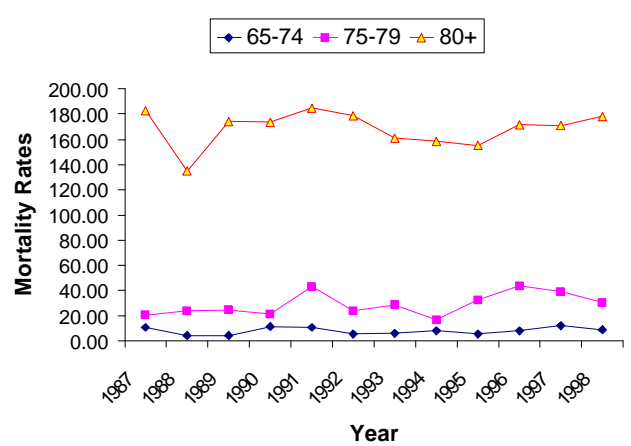
Average Annual Mortality Rates, per 100 000, Poisoning, Females



Average Annual Mortality Rates, per 100 000, Falls, Males



Average Annual Mortality Rates, per 100 000, Falls, Females



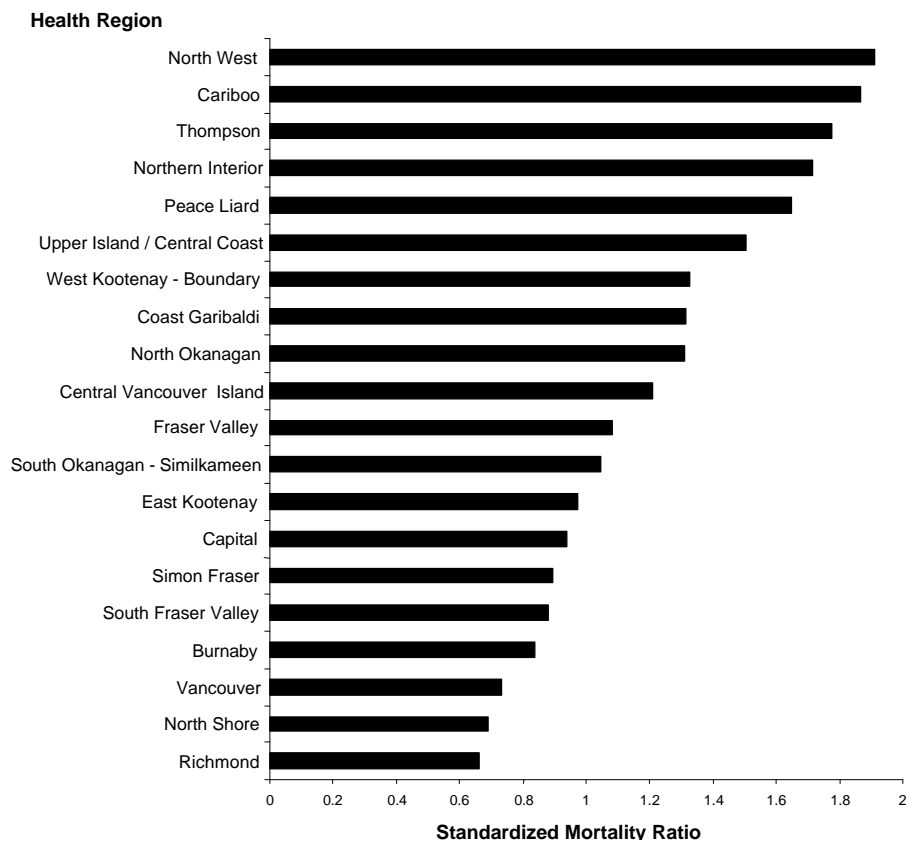
REGIONAL VARIATIONS IN INJURY MORTALITY

Significant variations in all-cause injury mortality rates were found among the health regions of BC. The overall pattern of variations revealed a statistically significant excess in injury mortality rates relative to

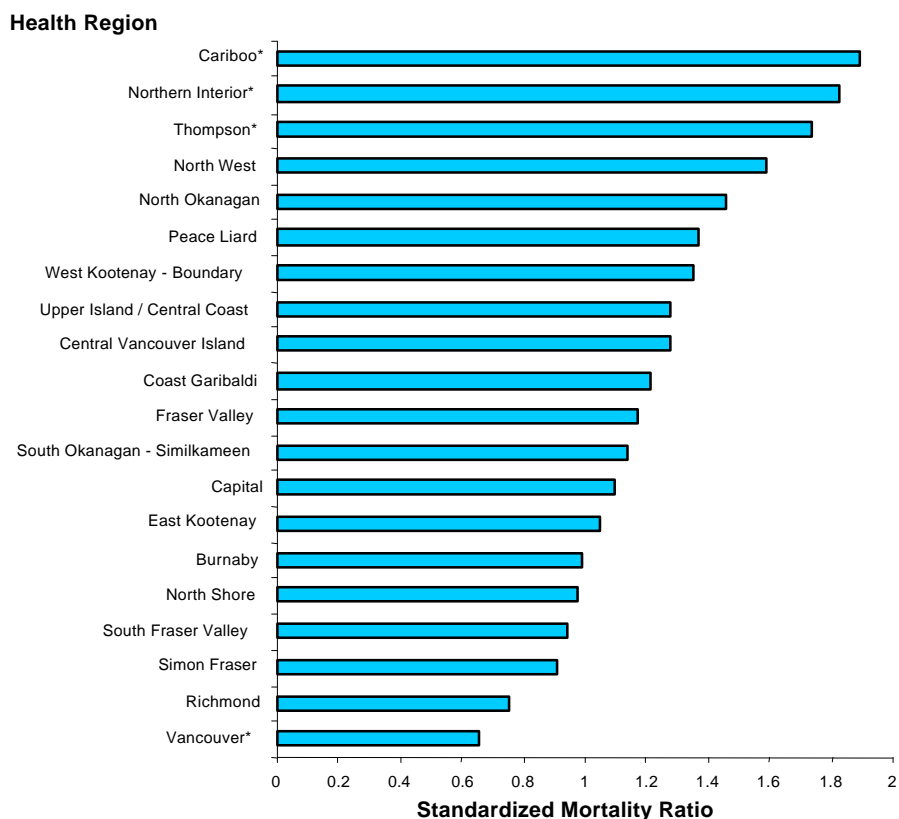
the province among adults and seniors in the northern regions, and significantly lower injury mortality rates in the southern regions.

Significantly higher injury mortality rates were found in northern British Columbia.

Standardized Mortality Ratios by Regions, 1987-1998, B.C., Males, Ages 25+



**Standardized Mortality Ratios by Regions, 1987-1998, B.C.,
Females, Ages 25+**



*indicates significance at $p < 0.05$

INJURY HOSPITAL SEPARATIONS BY AGE AND GENDER

From 1987 to 1998, there were a total of 405,165 hospital separations due to unintentional injuries among adults and seniors. Up to age 64, hospital separation rates were higher among males than females. Over 64 years of age, the pattern was reversed with higher rates of hospital separations among females than among males.

Up to age 64, hospital separation rates were higher among males than females. Over 64 years of age, the pattern was reversed with higher rates of hospital separations among females than among males.

Average Annual Age-Specific Hospital Separation Rates per 100,000 and Number of Injuries, B.C., 1987-1998

Age group	Male		Female	
	Total # of Injuries 1987-1998	Rate	Total # of Injuries 1987-1998	Rate
25-34	47558	1104.90	23322	557.32
35-44	39594	979.57	22335	560.89
45-64	52703	1044.90	41733	843.01
65-74	28147	1716.86	35787	1863.43
75-79	13887	2713.25	23619	3328.56
80+	22868	4627.59	53612	6154.43
25+	204757	1276.90	200408	1205.94

LEADING CAUSES OF INJURY HOSPITAL SEPARATIONS

The first two leading causes of hospitalization included injuries due to Motor Vehicle Traffic and Falls. These were the first and second leading causes among the younger age group of 25-34 years. Falls continued as the first leading cause of injury among those aged 35-44 years and older. In adults 45 years and older, Falls, Adverse

Effects, Motor Vehicle, and Misadventure were the four leading causes of injury. In addition, among the 75 years old and older age group, Poisoning emerged as the fifth leading cause of injury hospitalization.

Falls were the leading causes of injury hospital separations for all ages except 25-34 year olds.

Rank of Leading Causes of Injury Hospital Separations Among Adult and Seniors

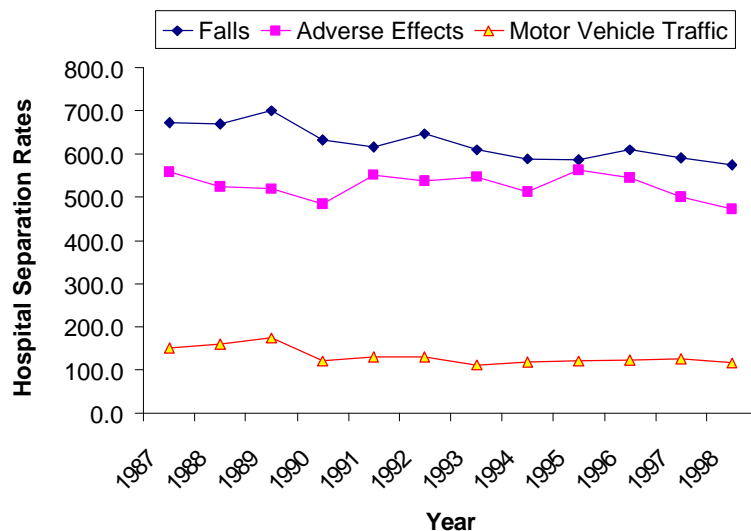
Categories or External Cause of Injury	25-34	35-44	45-64	65-74	75-79	80+
Over-exertion	5					
Late Effects		5	5	5		
Motor Vehicle Traffic	1	2	3	3	3	3
Misadventure			4	4	4	4
Falls	2	1	1	1	1	1
Poisoning					5	5
Adverse Effects	4	3	2	2	2	2
Struck by Object	3	4				

TRENDS IN INJURY HOSPITAL SEPARATIONS

Analysis of time trends revealed an overall downward trend in hospital separations due to injury. For all-cause injury, this downward trend in hospital separation rates was significant for both males and females. However, analysis of the trends by age groups revealed a more specific pattern among seniors 65-74 years; Falls, Adverse Effects and Motor Vehicle Traffic injuries remained at a constant level across the years. Similarly, among the 80 years and older age group, the rates also re-

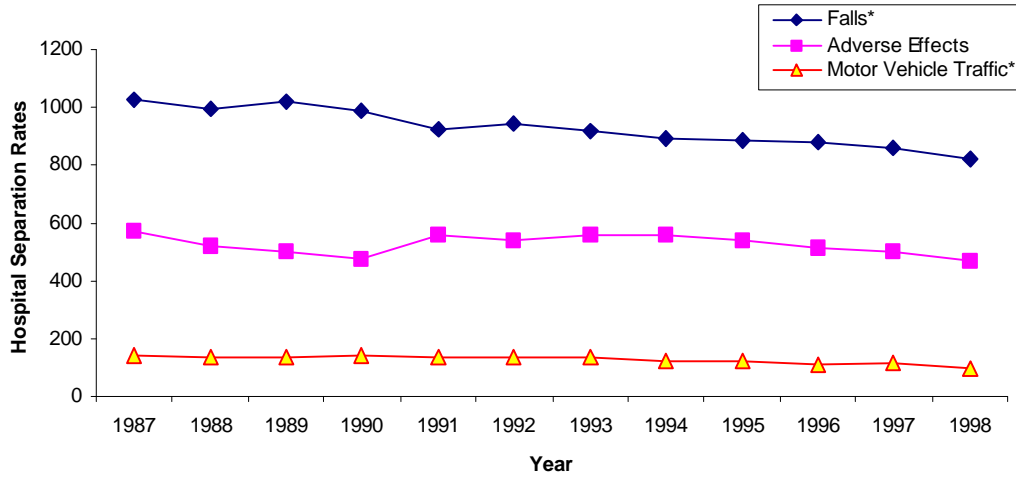
mained constant for Adverse Effects, Falls, Motor Vehicle Traffic, and Poisoning injuries.

Average Annual Hospital Separation Rates, 1987-98, BC, per 100 000, Males, Ages 65-74



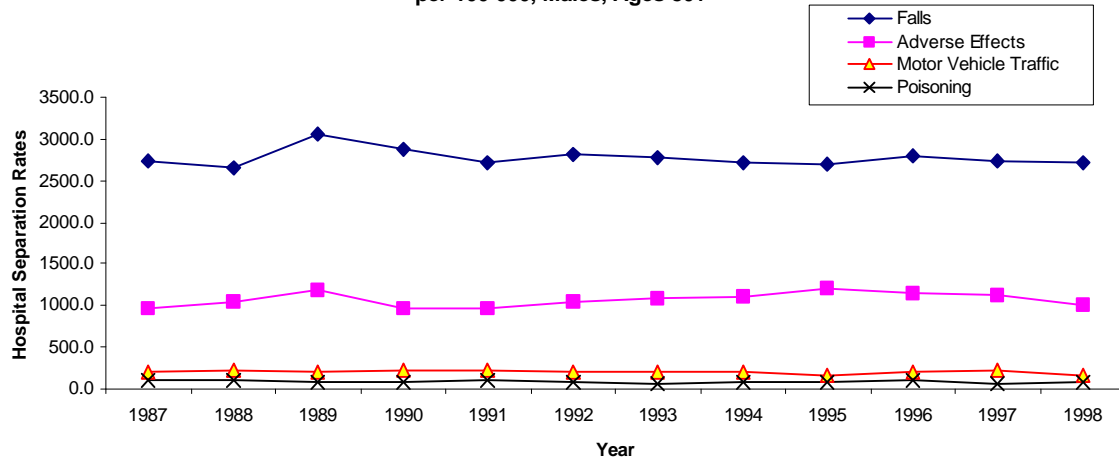
Analysis of time trends revealed an overall downward trend in hospital separations due to injury.

**Average Annual Hospital Separation Rates, 1987-1998, BC,
per 100 000, Females, Ages 65-74**

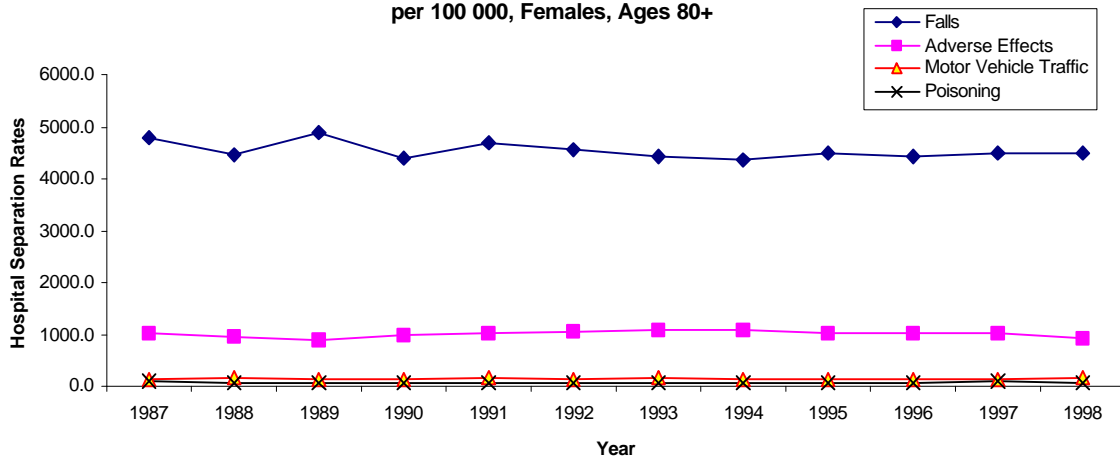


*indicates significant trend at $p < 0.05$

**Average Annual Hospital Separation Rates, 1987-1998, BC,
per 100 000, Males, Ages 80+**



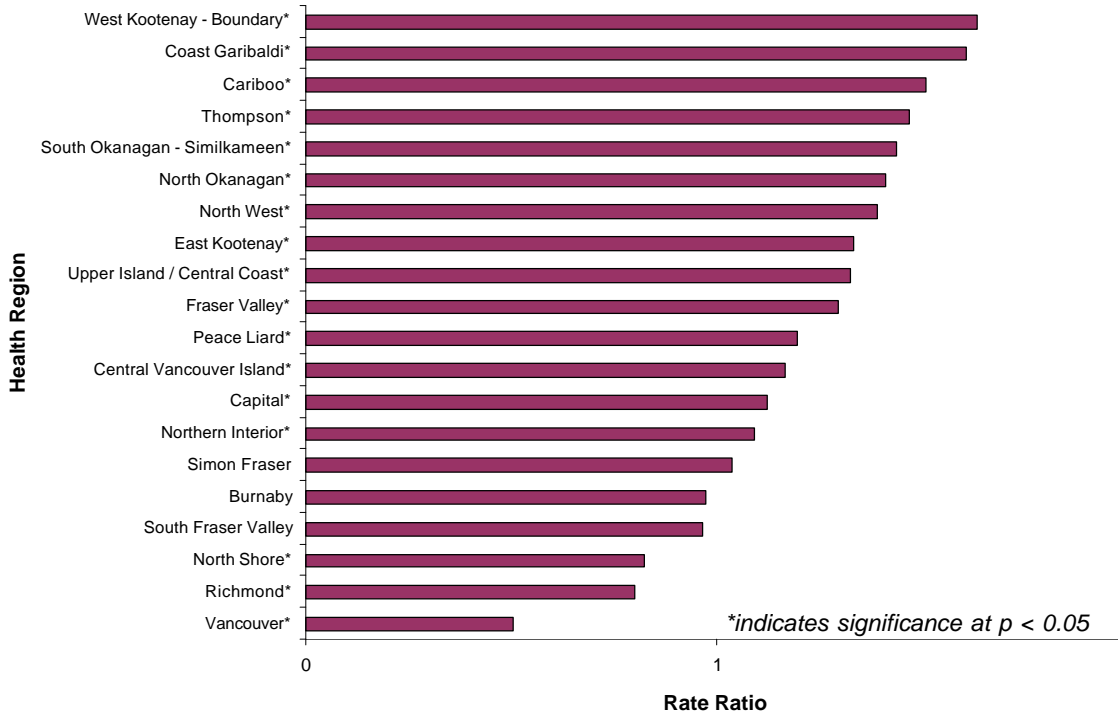
**Average Annual Hospital Separation Rates, 1987-1998, BC,
per 100 000, Females, Ages 80+**



REGIONAL VARIATIONS IN INJURY HOSPITAL SEPARATIONS

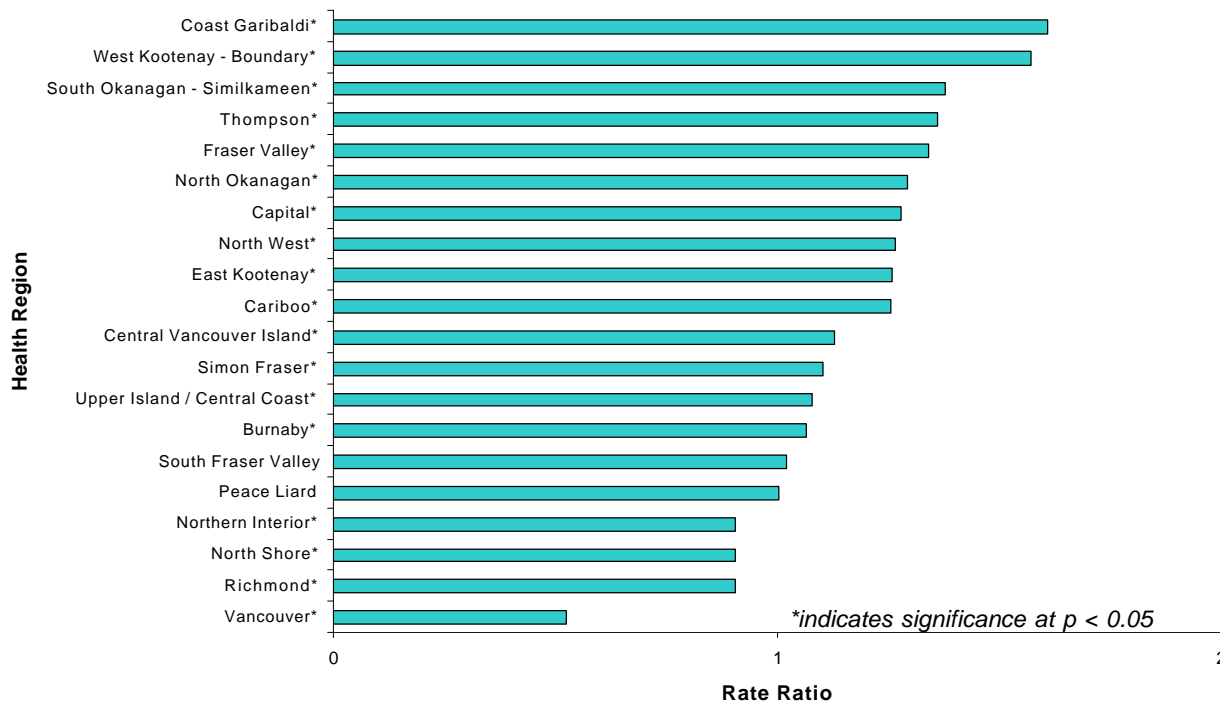
The pattern of regional variations in hospital separations due to injuries was similar to the mortality pattern, with higher injury rates among residents of northern and rural areas of BC as compared to those of southern and more urban areas.

Annual Average Standardized Hospital Separation Ratio, 1987-1998, BC, by Health Region, Males, Ages 25+



As with mortality, higher injury-related hospital separation rates were found among residents of northern and rural areas of BC.

Annual Average Standardized Hospital Separation Ratio, 1987-1998, BC, by Health Region, Females, Ages 25+

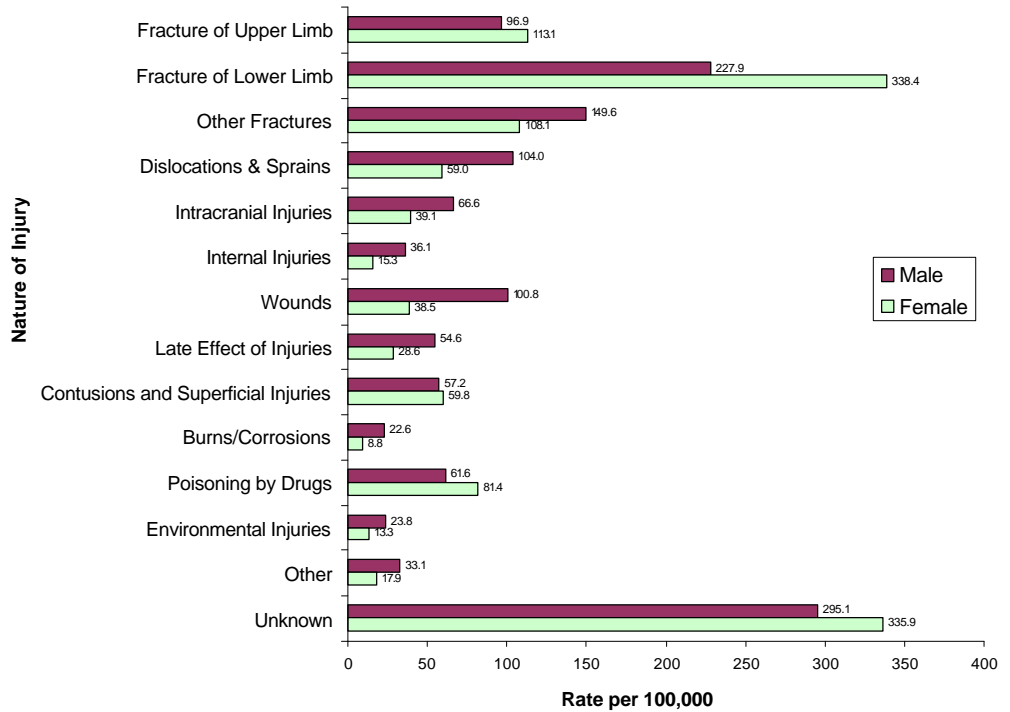


NATURE OF INJURIES

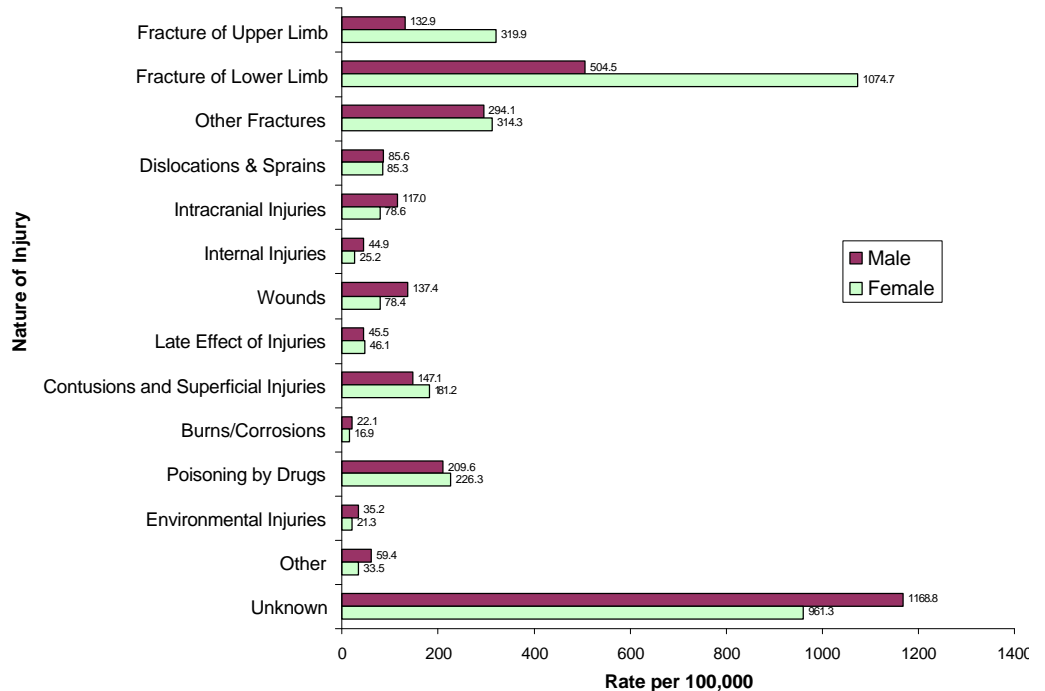
Our analysis of the nature of injuries indicates a high level of severity. Fractures were by far the leading type of injury for all-cause injury hospitalization for both males and females of all ages. Fractures of the Lower Limb among the 75-79 years age group were about two times higher than the rate among the 65-74 years age group. Within this age group, the rates were also noticeably high for Contusions, Superficial injuries, and Poisoning. Among the 80 years and older age group, Fractures (Fractures of the Lower and Upper Limb and Other Fractures) were particularly prevalent.

Fractures were by far the leading injury for all-cause injury hospitalization for both males and females of all ages.

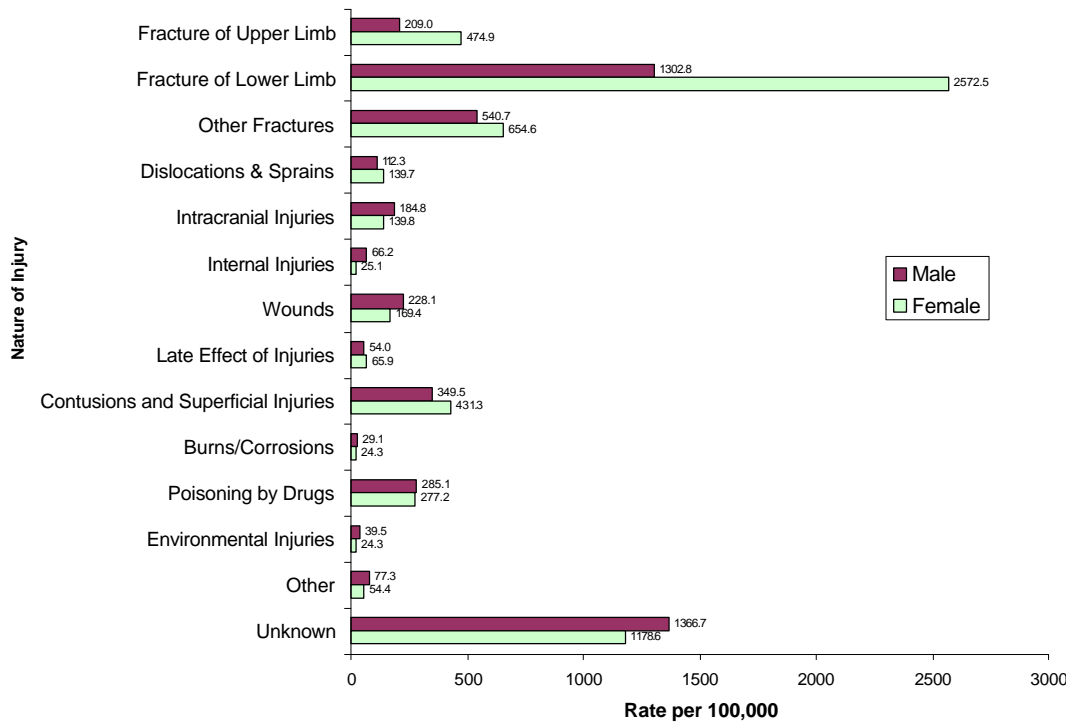
Annual Average Hospital Separation Rates, 1987-1998, BC, by Nature of Injury and Gender, All Ages



Annual Average Hospital Separation Rates, 1987-1998, BC, by Nature of Injury and Gender, Ages 75-79



**Annual Average Hospital Separation Rates, 1987-1998, BC,
by Nature of Injury and Gender, Ages 80+**

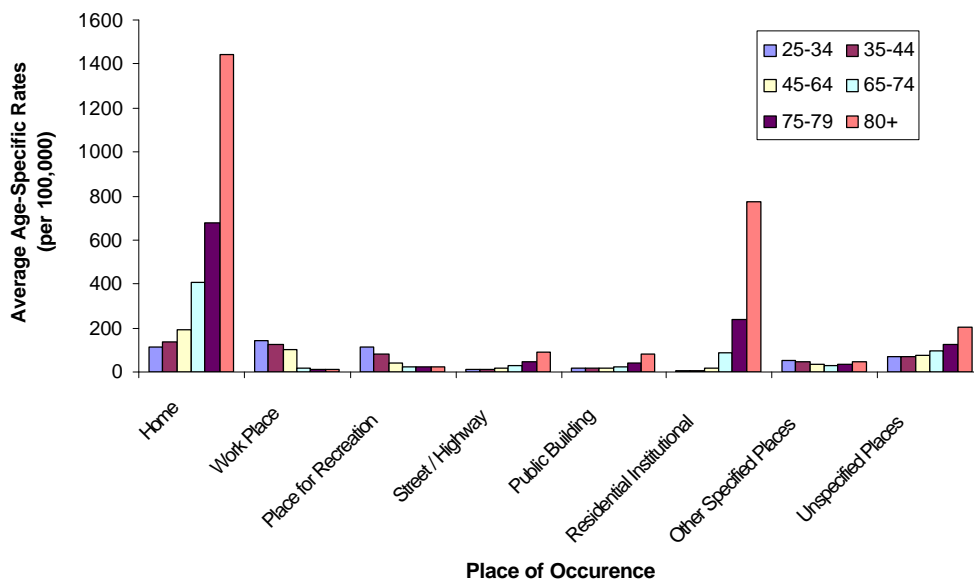


PLACE OF OCCURRENCE

Only 41 percent of injury hospitalizations recorded place of occurrence information. Analysis of the available data revealed that non-fatal injuries are most likely to occur at home for both genders especially among older age groups. Among males,

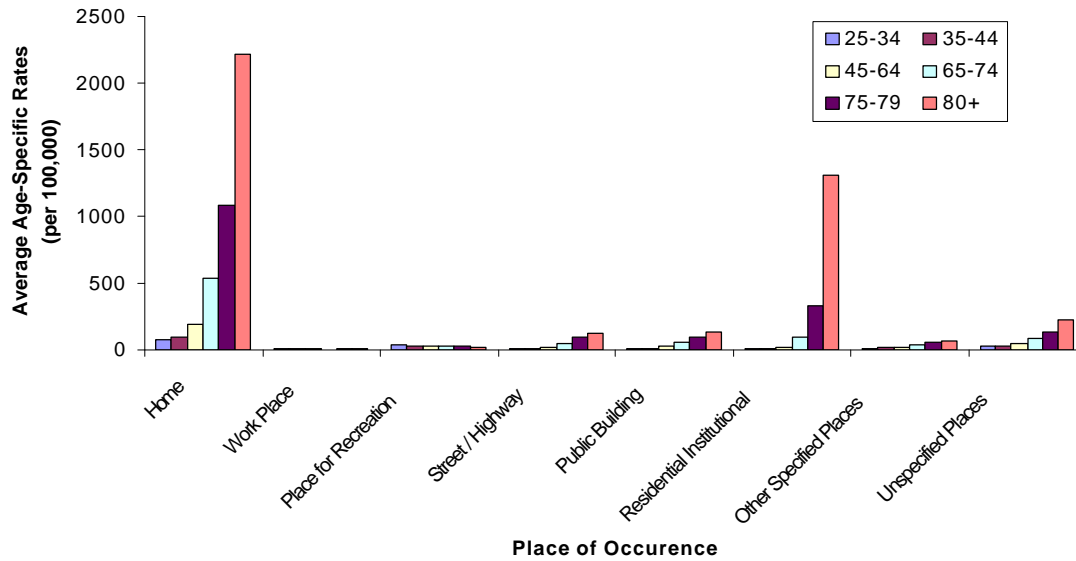
the second place of occurrence of injuries was the Workplace followed by Place for Recreation and Sport. Among both males and females, rates of injuries in Residential/Institutional Place increased noticeably with age.

**Annual Average Age-Specific Hospital Separation Rates, Males,
by Place of Occurrence and Age Group**



Analysis of the available data revealed that non-fatal injuries are most likely to occur at home for both genders especially among older age groups.

**Annual Average Age-Specific Hospital Separation Rates, Females,
by Place of Occurrence and Age Group**



OPPORTUNITIES FOR ACTION

The provincial and regional profile of unintentional injuries among adults and seniors developed in this study clearly supports the need for continued efforts in the area of injury prevention and control. The profile reveals, at the aggregate level, some emerging priorities toward which injury prevention efforts should be directed.

This report indicates two priority areas for action to improve research and prevention: Motor Vehicle Traffic and Falls injuries, especially among seniors and the elderly. Moreover, this report highlights an emerging priority in the area of Poisoning.

Motor Vehicle Traffic Injuries

The most promising areas of intervention reported in the literature address both equipment and environmental factors (Barss, Smith, Baker, & Mohan, 1998). Equipment factors consider the stability of vehicles, their

maximum speed capabilities and the energy-absorption capability of vehicles. Environmental factors address the quality of road design, identification of high-risk segments of highways, and the installation of protective barriers and breakaway features for fixed roadside obstacles.

In general, there is a need to sustain a well-organized public lobbying of governments regarding safety of motor vehicle occupants and pedestrians. In urban areas, engineering measures to control traffic flow (e.g., al-

This report indicates two priority areas for action to improve research and prevention: Motor Vehicle Traffic and Falls injuries, especially among seniors and the elderly. Moreover, this report highlights an emerging priority in the area of Poisoning.

tering traffic flow away from residential areas) and to reinforce low speeds have shown reduced injuries to all vulnerable road users including cyclists (Barss, Smith, Baker, & Mohan, 1998).

Studies also indicate that a dominant factor in the occurrence of Motor Vehicle Traffic injuries is alcohol. Among adults, alcohol is known as a substance associated with most types of injuries. Alcohol related interventions would protect most high-risk categories of injury and not only motor vehicle injuries.

Falls

This report indicates that falls contribute significantly to the total burden of injuries in BC, especially among seniors and the elderly. Falls are clearly a necessary priority for prevention and control given the aging population of BC. There is a need for increased focus and coordination of efforts in this area (Scott & Gallagher, 1999). Similar to other categories of injury, there is also a need for collecting information related to the risk and occurrence of falls in a manner that facilitates and promotes evidence-based practice. Currently available data come mostly from mortality and hospital separations and do not provide enough specificity to support planning strategies for the prevention of falls (Scott & Gallagher, 1999).

Poisoning: An Emerging Priority

In this report, analyses of the trends of mortality and hospitalizations during the last 12 years indicate that the area of Poisoning requires careful attention. Indeed, increasing trends were observed for Poisoning deaths for both males and females up to age 64. A similar result was found in previous analyses of BC mortality and hospital data for children and youth aged 15-24 (Soubhi et al., 1999). Thus, there is a need for a detailed documentation of the specific causes and nature of the poisoning involved as well as an improved un-

derstanding of the socioeconomic and regional variations in this emerging priority in BC.

Regional Variations

The pattern of regional differences identified in this study is similar to those reported in other studies conducted in developed countries (Barss, Smith, Baker, & Mohan, 1998). Regional variations in injury may be indicative of socioeconomic variations across the province. Numerous studies have shown that the socioeconomic differentials in mortality rates are large and the major source of this differential risk is traumatic deaths (Mare, 1982). Specific countermeasures should therefore move beyond the action on behavioral determinants of injury (e.g., law enforcement). They should include the influence of broader determinants, such as social and economic conditions, the physical environment, health care capacity, legislation and public health policies, in order to make a substantial and long lasting impact on the burden of injuries. A regional, community-based approach that builds on identified local needs and resources would be the most efficient in this regard. From this study, a need for more detailed data concerning the environment (physical and social) has been identified for evaluating the burden of injuries and their risk factors and conditions. There is also a need for coordinated regional policies in the area of unintentional injuries.

OVERALL CONCLUSIONS

Successful prevention programs are multifaceted and use a combination of approaches. The problem of unintentional injuries is too large and too diverse for any one group to address alone. There is a need for collaborative efforts among a broad range of disciplines, agencies and organizations to contribute to injury prevention, education and policy development. Reducing injury requires a systematic approach.

Based on two data sets, the results presented in this report provide a provincial profile of fatal and non-fatal unintentional injuries. This study identifies a number of high-risk issues, especially in the areas of motor vehicle traffic, falls and poisoning injuries, as well as in regional variations. We expect these results to serve as baseline data for assessing the impact of future changes in injury control and prevention in BC.

Injury control efforts need to have a system for establishing priorities and a systematic knowledge of policies and programs that are effective. Learning How, When, Where and Who is injured helps influence the setting of priorities. Understanding which approaches are most effective or ineffective helps rationalize the policy making process. Preferred interventions will include those for which there is strong scientific evidence of effectiveness, efficiency and efficacy. Ultimately, the critical indicators of successful implementation of an injury prevention program include legislative activities, surveillance, monitoring, evaluation, community involvement, and the ability to sustain the program.

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