

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

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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 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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TABLE OF CONTENTS

Table of Contents

Chapter 1: Introduction

Can Injuries Be Prevented?	17
The Injury Prevention and Evaluation Cycle (IPEC)	18
<i>Step 1: The Burden of Injury</i>	18
<i>Step 2: Identifying Risk Factors and Risk Conditions of Injury</i>	19
<i>Steps 3 and 4</i>	20
<i>Step 5</i>	20
<i>Steps 6 and 7</i>	21
<i>Data: the Hub of the Wheel</i>	21
Purpose of this Report	22
Methodology	22
References	24

Chapter 2: Mortality By Unintentional Injury

Results	27
<i>Injury Mortality by Age and Gender</i>	27
<i>Leading Causes of Injury Mortality</i>	27
<i>Time Trends in Injury Mortality</i>	31
Time Trends in the Age-Standardized Mortality Rates by Gender for	
All Causes of Injury	31
Trends in the Age-Specific Mortality Rates by Leading Causes	
and Gender	31
Age Group 25-34	31
Age Group 35-44	32
Age Group 45-64	33
Age Group 65-74	34
Age Group 75-79	35
Age Group 80+	36
<i>Regional Variations in Injury Mortality</i>	37

Chapter 3: Hospital Separations Due To Unintentional Injuries

Results	45
<i>Injury Hospital Separations by Age and Gender</i>	45
<i>Leading Causes of Injury Hospital Separation</i>	45
<i>Trends in Injury Hospital Separation</i>	49
Trends for All Causes of Unintentional Injury	49
Trends for Leading Causes by Age and Gender	49
Age Group 25-34	49
Age Group 35-44	51
Age Group 45-64	52
Age Group 65-74	53
Age Group 75-79	55
Age Group 80+	56
Patterns of Regional Variations	58
<i>Regional Variations in Injury Hospital Separation</i>	58

Age Group 25-34	58
Age Group 35-44	60
Age Group 45-64	60
Age Group 65-74	62
Age Group 75-79	62
Age Group 80+	64
Nature of Injury	66
<i>Nature of Injury by Gender</i>	66
<i>Nature of Injury by Age Groups and Gender</i>	67
Age Group 25-34	67
Age Group 35-44	68
Age Group 45-64	69
Age Group 65-74	70
Age Group 75-79	71
Age Group 80+	72
Place of Occurrence of Injuries	73
<i>Place of Occurrence for All Causes</i>	73
<i>Place of Occurrence for Hospital Separations by Age and Gender</i>	73

Chapter 4: Opportunities for Action

Overview of Main Results	77
<i>Injury Mortality by Age and Gender</i>	77
<i>Leading Causes of Injury Mortality</i>	77
<i>Time Trends in Injury Mortality</i>	77
<i>Regional Variations in Injury Mortality</i>	77
<i>Injury Hospital Separations by Age and Gender</i>	78
<i>Leading Causes of Injury Hospital Separations</i>	78
<i>Trends in Injury Hospital Separations</i>	78
<i>Regional Variations in Injury Hospital Separations</i>	78
<i>Nature of Injuries</i>	78
<i>Place of Occurrence</i>	78
Prevention and Policy Implications	79
<i>General Principles and Recommendations for Prevention</i>	79
Importance of Data in IPEC	79
<i>Specific Recommendations</i>	81
Age and Gender Differences	81
Leading Causes	82
Motor Vehicle Traffic Injuries	82
Falls	84
Poisoning: An Emerging Priority	85
Regional Variations	85
Conclusion	87
References	88

List of Figures

<i>Figure 1.1: The Injury Prevention and Evaluation Cycle.</i>	17
<i>Figure 1.2: Twelve Leading Causes of Death, 1995, BC.</i>	18
<i>Figure 1.3: Injury Pyramid.</i>	21

Figure 2.1:	Trends for Age-Standardized Mortality Rates, Injuries, 1987-1998, BC, by Gender, Ages 25+.	31
Figure 2.2:	Trends for Annual Age-Specific Mortality Rates, 1987-1998, BC, Males, Ages 25-34.	31
Figure 2.3:	Trends for Annual Age-Specific Mortality Rates, 1987-1998, BC, Females, Ages 25-34.	32
Figure 2.4:	Trends for Annual Age-Specific Mortality Rates, 1987-1998, BC, Males, Ages 35-44.	32
Figure 2.5:	Trends for Annual Age-Specific Mortality Rates, 1987-1998, BC, Females, Ages 35-44.	33
Figure 2.6:	Trends for Annual Age-Specific Mortality Rates, 1987-1998, BC, Males, Ages 45-64.	33
Figure 2.7:	Trends for Annual Age-Specific Mortality Rates, 1987-1998, BC, Females, Ages 45-64.	34
Figure 2.8:	Trends for Annual Age-Specific Mortality Rates, 1987-1998, BC, Males, Ages 65-74.	34
Figure 2.9:	Trends for Annual Age-Specific Mortality Rates, 1987-1998, BC, Females, Ages 65-74.	35
Figure 2.10:	Trends for Annual Age-Specific Mortality Rates, 1987-1998, BC, Males, Ages 75-79.	35
Figure 2.11:	Trends for Annual Age-Specific Mortality Rates, 1987-1998, BC, Females, Ages 75-79.	36
Figure 2.12:	Trends for Annual Age-Specific Mortality Rates, 1987-1998, BC, Males, Ages 80+.	36
Figure 2.13:	Trends for Annual Age-Specific Mortality Rates, 1987-1998, BC, Females, Ages 80+.	36
Figure 2.14:	Standardized Mortality Ratios, by Regions, 1987-1998, BC, Males, Ages 25+.	37
Figure 2.15:	Standardized Mortality Ratios, by Regions, 1987-1998, BC, Females, Ages 25+.	37
Figure 2.16:	Standardized Mortality Ratios, by Regions, 1987-1998, BC, Males, Ages 25-44.	38
Figure 2.17:	Standardized Mortality Ratios, by Regions, 1987-1998, BC, Females, Ages 25-44.	38
Figure 2.18:	Standardized Mortality Ratios, by Regions, 1987-1998, BC, Males, Ages 45-64.	39
Figure 2.19:	Standardized Mortality Ratios, by Regions, 1987-1998, BC, Females, Ages 45-64.	39
Figure 2.20:	Standardized Mortality Ratios, by Regions, 1987-1998, BC, Males, Ages 65-79.	40
Figure 2.21:	Standardized Mortality Ratios, by Regions, 1987-1998, BC, Females, Ages 65-79.	40
Figure 2.22:	Standardized Mortality Ratios, by Regions, 1987-1998, BC, Males, Ages 80+.	41
Figure 2.23:	Standardized Mortality Ratios, by Regions, 1987-1998, BC, Females, Ages 80+.	41
Figure 3.1:	Trends for Age-Standardized Hospital Separation Rates, Injuries, 1987-1998, BC, by Gender, Ages 25+.	49
Figure 3.2a:	Trends for Annual Age-Specific Hospital Separation Rates, 1987-1998, BC, Males, Ages 25-34.	49
Figure 3.2b:	Trends for Annual Age-Specific Hospital Separation Rates, 1987-1998, BC, Males, Ages 25-34.	49
Figure 3.3a:	Trends for Annual Age-Specific Hospital Separation Rates, 1987-1998, BC, Females, Ages 25-34.	50
Figure 3.3b:	Trends for Annual Age-Specific Hospital Separation Rates, 1987-1998, BC, Females, Ages 25-34.	50
Figure 3.4a:	Trends for Annual Age-Specific Hospital Separation Rates, 1987-1998, BC, Males, Ages 35-44.	51
Figure 3.4b:	Trends for Annual Age-Specific Hospital Separation Rates, 1987-1998, BC, Males, Ages 35-44.	51
Figure 3.5a:	Trends for Annual Age-Specific Hospital Separation Rates, 1987-1998, BC, Females, Ages 35-44.	51
Figure 3.5b:	Trends for Annual Age-Specific Hospital Separation Rates, 1987-1998, BC, Females, Ages 35-44.	52
Figure 3.6a:	Trends for Annual Age-Specific Hospital Separation Rates, 1987-1998, BC, Males, Ages 45-64.	52

Figure 3.6b:	Trends for Annual Age-Specific Hospital Separation Rates, 1987-1998, BC, Males, Ages 45-64.	52
Figure 3.7a:	Trends for Annual Age-Specific Hospital Separation Rates, 1987-1998, BC, Females, Ages 45-64.	53
Figure 3.7b:	Trends for Annual Age-Specific Hospital Separation Rates, 1987-1998, BC, Females, Ages 45-64.	53
Figure 3.8a:	Trends for Annual Age-Specific Hospital Separation Rates, 1987-1998, BC, Males, Ages 65-74.	53
Figure 3.8b:	Trends for Annual Age-Specific Hospital Separation Rates, 1987-1998, BC, Males, Ages 65-74.	54
Figure 3.9a:	Trends for Annual Age-Specific Hospital Separation Rates, 1987-1998, BC, Females, Ages 65-74.	54
Figure 3.9b:	Trends for Annual Age-Specific Hospital Separation Rates, 1987-1998, BC, Females, Ages 65-74.	54
Figure 3.10a:	Trends for Annual Age-Specific Hospital Separation Rates, 1987-1998, BC, Males, Ages 75-79.	55
Figure 3.10b:	Trends for Annual Age-Specific Hospital Separation Rates, 1987-1998, BC, Males, Ages 75-79.	55
Figure 3.11a:	Trends for Annual Age-Specific Hospital Separation Rates, 1987-1998, BC, Females, Ages 75-79.	55
Figure 3.11b:	Trends for Annual Age-Specific Hospital Separation Rates, 1987-1998, BC, Females, Ages 75-79.	56
Figure 3.12a:	Trends for Annual Age-Specific Hospital Separation Rates, 1987-1998, BC, Males, Ages 80+.	56
Figure 3.12b:	Trends for Annual Age-Specific Hospital Separation Rates, 1987-1998, BC, Males, Ages 80+.	56
Figure 3.13a:	Trends for Annual Age-Specific Hospital Separation Rates, 1987-1998, BC, Females, Ages 80+.	57
Figure 3.13b:	Trends for Annual Age-Specific Hospital Separation Rates, 1987-1998, BC, Females, Ages 80+.	57
Figure 3.14:	Annual Average Age-Specific Hospital Separation Rate Ratio, 1987-1998, BC, by Health Region, Males, Ages 25-34.	58
Figure 3.15:	Annual Average Age-Specific Hospital Separation Rate Ratio, 1987-1998, BC, by Health Region, Females, Ages 25-34.	59
Figure 3.16:	Annual Average Age-Specific Hospital Separation Rate Ratio, 1987-1998, BC, by Health Region, Males, Ages 35-44.	59
Figure 3.17:	Annual Average Age-Specific Hospital Separation Rate Ratio, 1987-1998, BC, by Health Region, Females, Ages 35-44.	60
Figure 3.18:	Annual Average Age-Specific Hospital Separation Rate Ratio, 1987-1998, BC, by Health Region, Males, Ages 45-64.	61
Figure 3.19:	Annual Average Age-Specific Hospital Separation Rate Ratio, 1987-1998, BC, by Health Region, Females, Ages 45-64.	61
Figure 3.20:	Annual Average Age-Specific Hospital Separation Rate Ratio, 1987-1998, BC, by Health Region, Males, Ages 65-74.	62
Figure 3.21:	Annual Average Age-Specific Hospital Separation Rate Ratio, 1987-1998, BC, by Health Region, Females, Ages 65-74.	63
Figure 3.22:	Annual Average Age-Specific Hospital Separation Rate Ratio, 1987-1998, BC, by Health Region, Males, Ages 75-79.	63
Figure 3.23:	Annual Average Age-Specific Hospital Separation Rate Ratio, 1987-1998, BC, by Health Region, Females, Ages 75-79.	64

Figure 3.24:	Annual Average Age-Specific Hospital Separation Rate Ratio, 1987-1998, BC, by Health Region, Males, Ages 80+.	65
Figure 3.25:	Annual Average Age-Specific Hospital Separation Rate Ratio, 1987-1998, BC, by Health Region, Females, Ages 80+.	65
Figure 3.26:	Annual Average Hospital Separation Rates, 1987-1998, BC, by Nature of Injury and Gender.	66
Figure 3.27:	Annual Average Hospital Separation Rates, 1987-1998, BC, by Nature of Injury and Gender, Ages 25-34.	67
Figure 3.28:	Annual Average Hospital Separation Rates, 1987-1998, BC, by Nature of Injury and Gender, Ages 35-44.	68
Figure 3.29:	Annual Average Hospital Separation Rates, 1987-1998, BC, by Nature of Injury and Gender, Ages 45-64.	69
Figure 3.30:	Annual Average Hospital Separation Rates, 1987-1998, BC, by Nature of Injury and Gender, Ages 65-74.	70
Figure 3.31:	Annual Average Hospital Separation Rates, 1987-1998, BC, by Nature of Injury and Gender, Ages 75-79.	71
Figure 3.32:	Annual Average Hospital Separation Rates, 1987-1998, BC, by Nature of Injury and Gender, Ages 80+.	72
Figure 3.33:	Annual Average Age-Specific Hospital Separation Rates, Males, by Place of Occurrence and Age Group.	74
Figure 3.34:	Annual Average Age-Specific Hospital Separation Rates, Females, by Place of Occurrence and Age Group.	75

List of Tables

Table 1.1:	Haddon Matrix	20
Table 2.1:	Average Annual Age-Specific Mortality Rates, per 100,000, and Number of Deaths, BC, 1987-1998.	27
Table 2.2:	Average Annual Mortality Rates, 1987-1998, BC, per 100,000, by External Cause of Injury and Gender, Ages 25+.	27
Table 2.2a:	Average Annual Age-Specific Mortality Rates, 1987-1998, BC, per 100,000, by External Cause of Injury and Gender, Ages 25-34.	28
Table 2.2b:	Average Annual Age-Specific Mortality Rates, 1987-1998, BC, per 100,000, by External Cause of Injury and Gender, Ages 35-44.	28
Table 2.2c:	Average Annual Age-Specific Mortality Rates, 1987-1998, BC, per 100,000, by External Cause of Injury and Gender, Ages 45-64.	29
Table 2.2d:	Average Annual Age-Specific Mortality Rates, 1987-1998, BC, per 100,000, by External Cause of Injury and Gender, Ages 65-74.	29
Table 2.2e:	Average Annual Age-Specific Mortality Rates, 1987-1998, BC, per 100,000, by External Cause of Injury and Gender, Ages 75-79.	30
Table 2.2f:	Average Annual Age-Specific Mortality Rates, 1987-1998, BC, per 100,000, by External Cause of Injury and Gender, Ages 80+.	30
Table 3.1:	Average Annual Age-Specific Hospital Separation Rates, 1987-1998, BC, per 100,000, and Number of Injuries.	45
Table 3.2a:	Average Annual Hospital Separation Rates, 1987-1998, BC, per 100,000, by External Cause of Injury and Gender, Ages 25-34.	46
Table 3.2b:	Average Annual Hospital Separation Rates, 1987-1998, BC, per 100,000, by External Cause of Injury and Gender, Ages 35-44.	46
Table 3.2c:	Average Annual Hospital Separation Rates, 1987-1998, BC, per 100,000, by External Cause of Injury and Gender, Ages 45-64.	47

Table 3.2d:	Average Annual Hospital Separation Rates, 1987-1998, BC, per 100,000, by External Cause of Injury and Gender, Ages 65-74.	47
Table 3.2e:	Average Annual Hospital Separation Rates, 1987-1998, BC, per 100,000, by External Cause of Injury and Gender, Ages 75-79.	48
Table 3.2f:	Average Annual Hospital Separation Rates, 1987-1998, BC, per 100,000, by External Cause of Injury and Gender, Ages 80+.	48
Table 3.3:	Average Annual Hospital Separation Rates, 1987-1998, BC, per 100,000, Ages 25+, by Place of Occurrence and Gender.	73

Appendices

Appendix A: Mortality By Injury

Appendix A-1:	Local Health Area Groupings by Health Regions, 1995, B.C.	93
Appendix A-2:	Causes of Unintentional Injuries by ICD-9 Code.	95
Appendix A-3:	Average Annual Age-Specific Mortality Rates per 100,000 and 95% Confidence Intervals, 1987-1998, BC, by Gender and Age Group.	96
Appendix A-4a:	Average Annual Age-Specific Mortality Rates per 100,000 and 95% Confidence Intervals, 1987-1998, BC, by Cause of Injury and Gender, Ages 25-34	97
Appendix A-4b:	Average Annual Age-Specific Mortality Rates per 100,000 and 95% Confidence Intervals, 1987-1998, BC, by Cause of Injury and Gender, Ages 35-44	98
Appendix A-4c:	Average Annual Age-Specific Mortality Rates per 100,000 and 95% Confidence Intervals, 1987-1998, BC, by Cause of Injury and Gender, Ages 45-64	99
Appendix A-4d:	Average Annual Age-Specific Mortality Rates per 100,000 and 95% Confidence Intervals, 1987-1998, BC, by Cause of Injury and Gender, Ages 65-74	100
Appendix A-4e:	Average Annual Age-Specific Mortality Rates per 100,000 and 95% Confidence Intervals, 1987-1998, BC, by Cause of Injury and Gender, Ages 75-79	101
Appendix A-4f:	Average Annual Age-Specific Mortality Rates per 100,000 and 95% Confidence Intervals, 1987-1998, BC, by Cause of Injury and Gender, Ages 80+	102
Appendix A-4g:	Average Annual Age-Specific Mortality Rates per 100,000 and 95% Confidence Intervals, 1987-1998, BC, by Cause of Injury and Gender, Ages 25+	103
Appendix A-5:	Age-Standardized Mortality Rates per 100,000 and 95% Confidence Intervals, 1987-1998, BC, by Year and Gender.	104
Appendix A-6a:	Average Annual Age-Specific Mortality Rates per 100,000 and 95% Confidence Intervals, by Gender and Year, Ages 25-34	105
Appendix A-6b:	Average Annual Age-Specific Mortality Rates per 100,000 and 95% Confidence Intervals, by Gender and Year, Ages 35-44	106
Appendix A-6c:	Average Annual Age-Specific Mortality Rates per 100,000 and 95% Confidence Intervals, by Gender and Year, Ages 45-64	107
Appendix A-6d:	Average Annual Age-Specific Mortality Rates per 100,000 and 95% Confidence Intervals, by Gender and Year, Ages 65-74	108
Appendix A-6e:	Average Annual Age-Specific Mortality Rates per 100,000 and 95% Confidence Intervals, by Gender and Year, Ages 75-79	109
Appendix A-6f:	Average Annual Age-Specific Mortality Rates per 100,000 and 95% Confidence Intervals, by Gender and Year, Ages 80+	110
Appendix A-7:	Standardized Mortality Ratios and 95% Confidence Intervals, 1987-1998, BC, by Health Region and Gender, Ages 25+.	111
Appendix A-8a:	Standardized Mortality Ratios and 95% Confidence Intervals, 1987-1998, BC, by Health Region and Gender, Ages 25-44.	112

Appendix A-8b:	Standardized Mortality Ratios and 95% Confidence Intervals, 1987-1998, BC, by Health Region and Gender, Ages 45-64.	113
Appendix A-8c:	Standardized Mortality Ratios and 95% Confidence Intervals, 1987-1998, BC, by Health Region and Gender, Ages 65-79.	114
Appendix A-8d:	Standardized Mortality Ratios and 95% Confidence Intervals, 1987-1998, BC, by Health Region and Gender, Ages 80+.	115

Appendix B: Hospital Separations

Appendix B-1:	Average Annual Age-Specific Hospital Separation Rates per 100,000 and 95% Confidence Intervals, 1987-1998, BC, by Gender and Age Groups.	119
Appendix B-2a:	Average Annual Hospital Separation Rates per 100,000 and 95% Confidence Intervals, 1987-1998, BC, by Cause of Injury and Gender, Ages 25-34	120
Appendix B-2b:	Average Annual Age-Specific Hospital Separation Rates per 100,000 and 95% Confidence Intervals, 1987-1998, BC, by Cause of Injury and Gender, Ages 35-44	121
Appendix B-2c:	Average Annual Age-Specific Hospital Separation Rates per 100,000 and 95% Confidence Intervals, 1987-1998, BC, by Cause of Injury and Gender, Ages 45-64	122
Appendix B-2d:	Average Annual Age-Specific Hospital Separation Rates per 100,000 and 95% Confidence Intervals, 1987-1998, BC, by Cause of Injury and Gender, Ages 65-74	123
Appendix B-2e:	Average Annual Age-Specific Hospital Separation Rates per 100,000 and 95% Confidence Intervals, 1987-1998, BC, by Cause of Injury and Gender, Ages 75-79	124
Appendix B-2f:	Average Annual Age-Specific Hospital Separation Rates per 100,000 and 95% Confidence Intervals, 1987-1998, BC, by Cause of Injury and Gender, Ages 80+	125
Appendix B-3a:	Average Annual Age-Specific Hospital Separation Rates per 100,000 and 95% Confidence Intervals, BC, 1987-1998, by Year and Gender.	126
Appendix B-3b:	Average Annual Age-Specific Hospital Separation Rates , per 100,000 and 95% Confidence Intervals, by Leading Causes of Injury and Year, Ages 25-34, Males.	127
Appendix B-3c:	Average Annual Age-Specific Hospital Separation Rates, per 100,000 and 95% Confidence Intervals, by Leading Causes of Injury and Year, Ages 25-34, Females.	128
Appendix B-3d:	Average Annual Age-Specific Hospital Separation Rates, per 100,000 and 95% Confidence Intervals, by Leading Causes of Injury and Year, Ages 35-44, Males.	129
Appendix B-3e:	Average Annual Age-Specific Hospital Separation Rates, per 100,000 and 95% Confidence Intervals, by Leading Causes of Injury and Year, Ages 35-44, Females.	130
Appendix B-3f:	Average Annual Age-Specific Hospital Separation Rates, per 100,000 and 95% Confidence Intervals, by Leading Causes of Injury and Year, Ages 45-64, Males.	131
Appendix B-3g:	Average Annual Age-Specific Hospital Separation Rates, per 100,000 and 95% Confidence Intervals, by Leading Causes of Injury and Year, Ages 45-64, Females.	132
Appendix B-3h:	Average Annual Age-Specific Hospital Separation Rates, per 100,000 and 95% Confidence Intervals, by Leading Causes of Injury and Year, Ages 65-74, Males.	133
Appendix B-3i:	Average Annual Age-Specific Hospital Separation Rates, per 100,000 and 95% Confidence Intervals, by Leading Causes of Injury and Year, Ages 65-74, Females.	134
Appendix B-3j:	Average Annual Age-Specific Hospital Separation Rates, per 100,000 and 95% Confidence Intervals, by Leading Causes of Injury and Year, Ages 75-79, Males.	135
Appendix B-3k:	Average Annual Age-Specific Hospital Separation Rates, per 100,000 and 95% Confidence Intervals, by Leading Causes of Injury and Year, Ages 75-79, Females.	136
Appendix B-3l:	Average Annual Age-Specific Hospital Separation Rates, per 100,000 and 95% Confidence Intervals, by Leading Causes of Injury and Year, Ages 80+, Males.	137
Appendix B-3m:	Average Annual Age-Specific Hospital Separation Rates, per 100,000 and 95% Confidence Intervals, by Leading Causes of Injury and Year, Ages 80+, Females.	138

<i>Appendix B-4a:</i>	<i>Average Annual Hospital Separation Rate Ratios and 95% Confidence Intervals, 1987-1998, BC, by Health Region, Males, Ages 25-64.</i>	<i>139</i>
<i>Appendix B-4b:</i>	<i>Average Annual Hospital Separation Rate Ratios and 95% Confidence Intervals, 1987-1998, BC, by Health Region, Males, Ages 65+.</i>	<i>140</i>
<i>Appendix B-5a:</i>	<i>Average Annual Hospital Separation Rate Ratios and 95% Confidence Intervals, 1987-1998, BC, by Health Region, Females, Ages 25-64.</i>	<i>141</i>
<i>Appendix B-5b:</i>	<i>Average Annual Hospital Separation Rate Ratios and 95% Confidence Intervals, 1987-1998, BC, by Health Region, Females, Ages 65+.</i>	<i>142</i>
<i>Appendix B-6a:</i>	<i>Average Annual Hospital Separation Rates per 100,000 and 95% Confidence Intervals, 1987-1998, BC, by Nature of Injury and Gender, Ages 25-34.</i>	<i>143</i>
<i>Appendix B-6b:</i>	<i>Average Annual Hospital Separation Rates per 100,000 and 95% Confidence Intervals, 1987-1998, BC, by Nature of Injury and Gender, Ages 35-44.</i>	<i>144</i>
<i>Appendix B-6c:</i>	<i>Average Annual Hospital Separation Rates per 100,000 and 95% Confidence Intervals, 1987-1998, BC, by Nature of Injury and Gender, Ages 45-64.</i>	<i>145</i>
<i>Appendix B-6d:</i>	<i>Average Annual Hospital Separation Rates per 100,000 and 95% Confidence Intervals, 1987-1998, BC, by Nature of Injury and Gender, Ages 65-74.</i>	<i>146</i>
<i>Appendix B-6e:</i>	<i>Average Annual Hospital Separation Rates per 100,000 and 95% Confidence Intervals, 1987-1998, BC, by Nature of Injury and Gender, Ages 75-79.</i>	<i>147</i>
<i>Appendix B-6f:</i>	<i>Average Annual Hospital Separation Rates per 100,000 and 95% Confidence Intervals, 1987-1998, BC, by Nature of Injury and Gender, Ages 80+.</i>	<i>148</i>
<i>Appendix B-7:</i>	<i>Categories of Place of Occurrence of Injuries.</i>	<i>149</i>
<i>Appendix B-8:</i>	<i>Average Annual Hospital Separation Rates per 100,000 and 95% Confidence Intervals, 1987-1998, BC, by Place of Occurrence and Gender.</i>	<i>151</i>
<i>Appendix B-9a:</i>	<i>Average Annual Age-Specific Hospital Separation Rates per 100,000 and 95% Confidence Intervals, 1987-1998, BC, by Place of Occurrence and Age Group, Males.</i>	<i>152</i>
<i>Appendix B-9b:</i>	<i>Average Annual Age-Specific Hospital Separation Rates per 100,000 and 95% Confidence Intervals, 1987-1998, BC, by Place of Occurrence and Age Group, Females.</i>	<i>153</i>
List of Abbreviations		155

INTRODUCTION

Can Injuries be Prevented?

The injury literature shows that patterns of injury can be identified on the basis of age, gender, cause, social characteristics and geographic location (Rivara & Mueller, 1987). These patterns represent opportunities for prevention. For example, injuries have been found to be more common in lower income households, and people living in rural areas are at greater risk than their metropolitan counterparts. These patterns point to the potential for targeting injury prevention to specific groups, and to the need for considering injury as the result of preventable factors and not of chance occurrences.

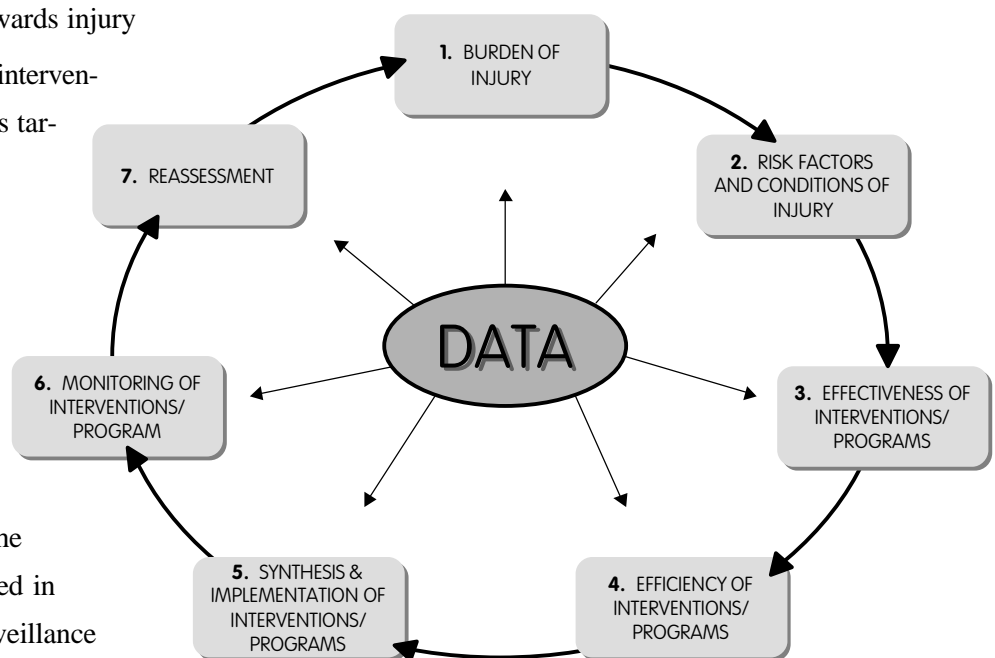
The steps to understanding and preventing injuries can be viewed through the Injury Prevention and Evaluation Cycle (IPEC) (Soubhi, et al., 1999). IPEC includes seven steps [Figure 1.1]:

- Assessing the burden of injury
- Identifying risk factors and conditions of injury
- Evaluating the efficacy of interventions and preventive actions targeted towards injury
- Evaluating the efficiency of interventions and preventive actions targeted towards injury
- Implementing new injury prevention initiatives
- Monitoring injury prevention initiatives
- Reassessing the burden of injury

This cycle is iterative in that the burden of injury may be reduced in small increments, and that surveillance must be maintained in order to sustain continued reduction. This study will focus on the

first step of IPEC, assessing the burden of injury among adults and seniors in BC. This study will also provide the foundation for the second step, identifying risk factors and risk conditions of injury, by looking at the variation in injury events between age groups, gender, geographic locations and other information. Based on mortality and hospitalization data, patterns of fatal and non-fatal injuries among adults and seniors in BC will be described, including leading causes of injury, time trends, and regional variation.

Figure 1.1: The Injury Prevention and Evaluation Cycle.



The Injury Prevention and Evaluation Cycle (IPEC)

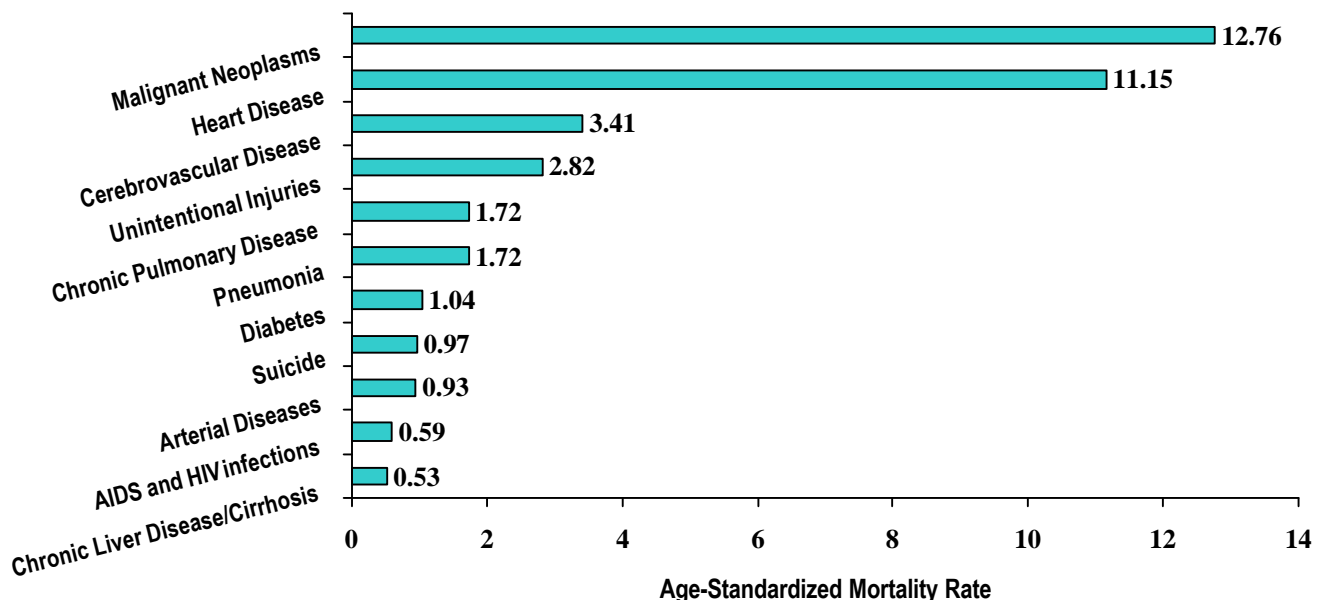
STEP 1: THE BURDEN OF INJURY

The first step in IPEC is the assessment of the burden of injury on the individual, the family, the community and the health care system. This can be measured using mortality rates, morbidity rates, or financial costs.

Injuries among adults and seniors are responsible for a high number of deaths and hospitalizations, as well as 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). In 1995 unintentional injuries were the fourth leading cause of death for all age groups in BC (BC Ministry of Health, 1996) [Figure 1.2]. 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 40%

of these deaths (2,287 deaths) occurred among Canadians over 70 years old 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 review of the literature, 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

Figure 1.2: Twelve Leading Causes of Death, 1995, BC.



for more than half of all deaths for Canadians over the age of 65 (Raina, Torrance and Lindsay, 1997).

Injuries among adults and seniors also have undesirable consequences on their lifestyle and economic productivity. For example, the physical nature of seniors (especially in the older age groups) means that falls often result in more serious fractures and longer periods of recovery (Wilkins, 1989; Raina, Torrance and Lindsay, 1997). Other studies show a notable relationship between the severity of the injury (and its potential impact on long-term disability) and the body part affected by the injury. This suggests that even if total prevention may be difficult to achieve, programs, products, policies and legislation need to be developed to reduce the impact of injuries such as of the spinal cord, the brain/skull, and the lower extremities. Moreover, not all age groups are affected similarly, falls tend to be much more prevalent among preschoolers and elderly women than other age groups, and younger males are much more affected by motor vehicle crashes than other groups in the population (Angus et al., 1998).

We also know that injuries bring high costs to society and to the health care system. In Canada, the total cost¹ of major causes of illness for 1993 was estimated at \$156.9 billion, roughly 22% of the gross domestic product (Health Canada, 1997). The total burden of illness due to injury (both intentional and unintentional) was 11.1%, or \$14.3 billion, ranking as the third largest contributor to the cost of illness among all categories. Only cardiovascular and musculo-skeletal disease exceeded injury in total cost. Costs associated with cancer were smaller than the economic burden of injury. A more recent study estimated the total cost of unin-

tentional injuries in Canada, during the period 1995-1996, to be over \$8.7 billion (Angus et al., 1998). These numbers do not reflect the human and emotional costs for the injured individuals and their families.

STEP 2: IDENTIFYING RISK FACTORS AND RISK CONDITIONS OF INJURY

The second step of IPEC is to identify risk factors and risk conditions of injury. It incorporates theory-based models that drive this identification at the individual and the population levels. Haddon (1972, 1980) proposed a model to elucidate risk factors at the individual level. This model has been used extensively in the injury literature. It examines risk factors of injury according to three phases of the injury event: pre-event, event and post-event (Haddon 1972, 1980). Pre-event factors are associated with the probability of an injury incident occurring. The event factors are associated with the likelihood and severity of the injury, and post-event factors affect the outcome once the injury has occurred. This model elaborates on the classical epidemiological triad, which includes the interaction of a host (e.g. the individual to whom the injury occurs), the agent/vector of the injury (e.g. a car), and the environment (e.g. on the highway).

However, a paradigm shift has been made toward a population health approach that is recommended for health-related research. Risk factors and risk conditions at the population level can be studied using the population health model proposed by Evans and Stoddart (1994). This model "...focuses on the interrelated conditions and factors that have an impact on the health of human populations and sub-populations across the life stages. It encompasses the social, economic and physi-

¹Total costs include direct and indirect costs. Direct costs include costs for drugs, research costs, medical care and hospital costs, as well as costs related to pensions and benefits for disabled individuals. Indirect costs include the value of lost productivity due to illness or disability and the present value of future income lost by people who die prematurely (Wigle, Mao, Wong & Lane, 1991).

cal environments, personal health practices, individual capacity and coping skills, health services, human biology and early childhood development.” (NHRDP Toward 2001, 1997)

The population health model encompasses the ways in which the following eight groupings of risk factors and conditions are interrelated and produce health (e.g. low injury rates) in the population:

- Social environment
- Physical environment
- Individual response (biology and behaviour)
- Genetic endowment
- Economic prosperity
- Health care
- Disease (injury)
- Well-being

STEPS 3 AND 4

The third step in the cycle is the assessment of the effectiveness of intervention programs designed to prevent injuries or reduce the severity of injuries. How successful are we in preventing injuries? How well can we identify preventable injury? Will professionals or communities provide the injury prevention programs? Will individuals comply with injury prevention strategies? Do the injury prevention programs reach those who really need it?

The next step in the cycle looks at the efficiency of the existing intervention (Step 4). Is the injury prevention program being offered in a way that is cost-effective, resulting in the greatest benefit for every dollar spent?

STEP 5

The fifth step in the cycle examines the issues related to the implementation of new injury prevention program initiatives. It examines the applicabil-

Table 1.1 Haddon Matrix

	Pre-Event	Event	Post-Event
Environment			
Agent/Vehicle			
Host			

Source: Haddon, W. Jr. *Advances in the Epidemiology of Injuries as a Basis For Public Policy*. Public Health Reports 95(5), 1980: 411-421.

ity of the initiative, the availability of resources, and the influence of individual care providers or community organizations.

For example Haddon’s model can be used to organize and implement injury prevention programs (Haddon, 1980). By combining the three phases of the injury event with characteristics of the host, agent/vehicle and environment, a comprehensive matrix of categories for **studying injuries is created** [Table 1.1]. Each cell in the matrix can be examined for both its contribution and role in controlling the occurrence of injury and reducing its consequences (Rivara & Mueller, 1987). For example, a motor vehicle accident on the highway may

	Pre-Event	Event	Post-Event
Environment	Winter	Icy patch on road	Distance to emergency services
Agent/Vehicle	Over speed limit	Skidding into a tree	Mangled car
Host	No seat belt	Hits head	Coma

look like this:

Control strategies can help prevent events which might lead to injury (pre-event phase); help protect individuals should an event happen (event-phase); or minimize the outcome and consequences of an event through prompt emergency services, appropriate medical care and rehabilitation when necessary (post-event phase). In this example it may be helpful to consider the environment including the enforcement of legislation for

speed limits, seatbelt use or drinking and driving, the socially accepted attitudes concerning safe driving, or the road conditions, maintenance and visibility. For the agent/vehicle it may be important to consider the type of vehicle and the safety features provided, the speed at which it was travelling, and the conditions of the brakes etc. And looking at the host, what was the driver's physical condition, what safety precautions were taken, what was the driver's skill level and experience?

STEPS 6 AND 7

The final two steps of IPEC evaluate and monitor the injury prevention initiative (Step 6) and reassess the burden of injury (Step 7). Is the program achieving its objectives? Has the burden of injury been reduced?

DATA: THE HUB OF THE WHEEL

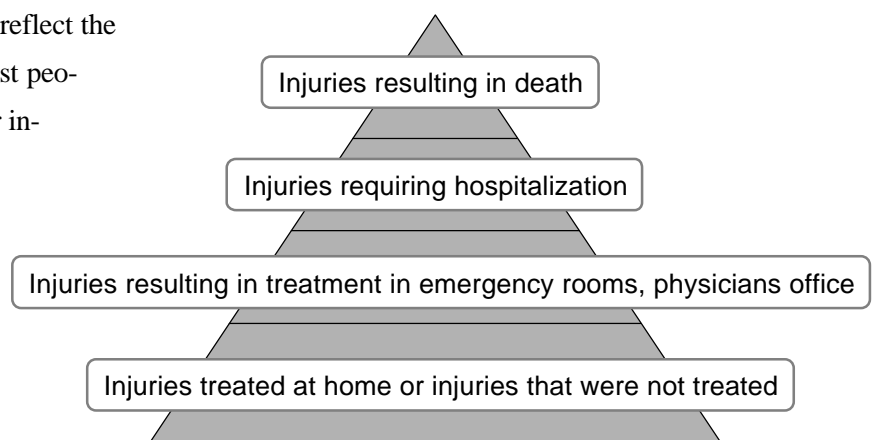
Appropriate data (either preexisting or new) are required to address each step and drive the Injury Prevention and Evaluation Cycle. Therefore data can be viewed as the hub of the wheel. A large number of studies in injury have focused solely on mortality as an important health status indicator because these data are easily obtainable and routinely collected. However, mortality data do not give a complete account of the magnitude of the burden of injuries. As illustrated in *Figure 1.3*, mortality-based data do not reflect the extent of an injury problem because most people who are injured do not die from their injuries (Hader & Seliske, 1993).

A system such as IPEC should therefore not rely on mortality data alone, but also include morbidity data to provide a more complete picture of injury events. This system could include hospital, physician's office, school, com-

munity and emergency department data. Hence a need exists for broadening the scope of injury data collection and analysis to assist in designing better preventive measures targeted to substantially reduce injuries. The objectives of a data collection system focusing on injuries would be:

- 1) To determine the burden of injury in local areas (steps 1 & 7);
- 2) To determine priorities for action on specific injuries (identified by their causes) for specific age groups (step 2);
- 3) To coordinate injury prevention efforts through shared information with different agencies and stakeholders;
- 4) To provide the information necessary to evaluate the impact of new laws, regulations, and programs on community injury rates (steps 3 & 4);
- 5) To implement and monitor the programming to reduce injuries in the community (steps 5 & 6).

Figure 1.3: Injury Pyramid.



adapted from Injuries in Saskatchewan, 1993

Purpose of This Report

The main purpose of this study is to complete the first step of IPEC. This study is designed to develop a population-based profile of fatal and non-fatal unintentional injuries among adults and seniors in BC based on mortality and hospitalization data. This

report will also explore the second step of IPEC, identifying risk factors and risk conditions of injury. This will be accomplished by describing injury variation by age, gender, region, year, and place of occurrence of injury events.

Methodology

Two data sets were used for the purpose of the present study: BC Vital Statistics mortality data, and BC hospital separation data. More detail with respect to analysis for each of the data sets is included below.

Mortality by Unintentional Injuries, BC Vital Statistics Data

Data on numerators as well as population denominators were provided by the BC Vital Statistics Agency. The present report is based on 13,767 deaths by unintentional injuries among adults and seniors (25 and over) that were known residents of BC during the period from 1987 to 1998. The population data contained four variables; year, Local Health Area (LHA), gender, and age (in five-year age groups). A fifth variable was created from the LHA for Health Region (HR) according to the 1995 conversion table established by the BC Ministry of Health (See Appendix A-1). Mortality data were then merged with the population data by matching the files with respect to year, gender, age group and HR.

Analyses

Rates were calculated per 100,000 population for age, gender, year, injury category (Appendix A-8), and HR.

Further analyses were conducted by comparing the age-standardized rates across the leading injury categories. Age-specific rates were used as much as possible. To show differences in age structures across regions, rates were standardized using indirect standardization with the provincial annual average age-specific rates for the study period. Indirect standardization was used to calculate Standardized Mortality Ratios (SMR).

SAS Version 9 for Windows was used to calculate the age-specific and age-standardized rates, and to derive standardized mortality ratios (SMR). For each of these rates and ratios, 95% Confidence Intervals (CIs) were calculated. The SMR is a preferred measure for comparing mortality data that are based on small numbers of cases, or for comparing mortality data by geographical area (Breslow & Day, 1987). The SMR is the ratio of the number of observed to the number of expected deaths based on provincial age-specific mortality rates. The SMR is often expressed as a percentage or as a deviation from the value 1. For example, in our analysis, an SMR of 1.20 means an excess of injury mortality of 20% relative to the province, while an SMR of 0.60 means that, compared to the province, the given area had 40% less injury mortality.

Cautions and Caveats

Accuracy and consistency of mortality data cannot be totally assumed because physicians and other health professionals responsible for diagnosing and coding the cause of death differ in their skills and practices. There may be some variations in death certification and coding practices which are difficult to control for. Confidence Intervals (95%) were calculated for all estimates of injury mortality rates, thereby providing an indication of the stability of these estimates.

Hospital Separations due to Unintentional Injuries

The BC Ministry of Health, Regional Performance Analysis Branch, provided separation data for all injury hospitalizations in the province of BC for the fiscal years 1987 to 1998. The data for this study included external causes of injury based on the International Classification of Diseases (ICD-9) (WHO, 1975) by Local Health Areas (LHA), age (five-year age groups) and gender. E-codes included four-digit sub-categories allowing for a more precise categorization of causes of injury than was possible with the mortality data (Appendix A-2). The categories of causes of injury were derived according to the same coding scheme used for mortality data. An additional scheme of five injury categories was created using the third and fourth numerical digits of the ICD-9 E-codes provided in the database. All the data files were provided on CD-ROM, integrated in the LAN Accident Reporting System (LARS) Version 3.00, designed and revised (03/07/2000) by the Information Management Group, BC Ministry of Health.

Analyses

The analyses were conducted on 405,165 hospital separations due to unintentional injuries among adult males and females (over 25 years old) that were known

residents of BC during the period from 1987 to 1998. The analyses followed a similar approach to the one used for the analysis of mortality data.

Cautions and Caveats

The same cautions and caveats related to the ascertainment of cases can be applied to hospital separations as they applied to mortality data. Furthermore, hospitalization data can vary over time and between areas for factors not related to health, such as accessibility of treatment, medical and administrative decisions that bear on the number and length of hospital stay (Chevalier, Choiniere, Ferland, Pageau, & Sauvageau, 1995; Walsh and Jarvis, 1992).

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MORTALITY BY UNINTENTIONAL INJURY

Results

INJURY MORTALITY BY AGE AND GENDER

The average annual age-specific mortality rates per 100,000 as well as the total number of deaths from 1987 to 1998 are presented in *Table 2.1*. Mortality due to injury was significantly higher among males than among females for age groups 25-74 years ($p < 0.001$). See *Appendix A-3* for the 95% CIs.

Table 2.1: 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 number of deaths and the average annual mortality rates due to injury among different age groups by external causes and gender are displayed in *Table 2.2a-f*. Up to age 64, Motor Vehicle Traffic and Poisoning injuries represented the first two leading causes of death for both genders. Over age 64, the

first two leading causes of death were Falls and Motor Vehicle Traffic injuries for both genders. Drowning/Submersion was the third leading cause of death among males and females in the 25-34 years age group and remained the third to fourth leading cause of death among adults aged 35-64 years. Other and Unspecified

Table 2.2: Average Annual Mortality Rates, 1987-98, BC, per 100,000, by External Cause of Injury and Gender, Ages 25+

Categories of External Cause of Injury	Male			Female			Total		
	Number of Deaths	Rate	Rank	Number of Deaths	Rate	Rank	Number of Deaths	Rate	Rank
Explosives	24	0.15	1	3	0.02	2	27	0.08	1
Electricity	46	0.29		2	0.01		48	0.15	
Other/Unspecified	84	0.52		35	0.21		119	0.36	
Late Effects	86	0.54		54	0.32		140	0.43	
Motor Vehicle Traffic*	2587	16.13		1185	7.13		3772	11.55	
Non - MV Pedal Cycle	13	0.08	5	6	0.04	4	19	0.06	2
Off-Road MV	38	0.24		4	0.02		42	0.13	
Other/Unspecified Transport	316	1.97		54	0.32		370	1.13	
Misadventure	24	0.15		31	0.19		55	0.17	
Falls	1762	10.99		1949	11.73		3711	11.36	
Environmental	170	1.06	4	49	0.29	5	219	0.67	4
Fire, Flames and Hot Substances	234	1.46		135	0.81		369	1.13	
Drowning and Submersion	558	3.48		110	0.66		668	2.05	
Poisoning	2401	14.97		710	4.27		3111	9.53	
Adverse Effects	78	0.49		86	0.52		164	0.50	
Suffocation	254	1.58	2	168	1.01	3	422	1.29	3
Struck by object	231	1.44		13	0.08		244	0.75	
Machinery	202	1.26		10	0.06		212	0.65	
Cutting/Piercing	15	0.09		4	0.02		19	0.06	
Firearms	33	0.21		3	0.02		36	0.11	
Total	9156	57.10		4611	27.75		13767	43.20	

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

Table 2.2a: Average Annual Age-Specific Mortality Rates, 1987-98, BC, per 100,000, by External Cause of Injury and Gender, Ages 25-34

Categories of External Cause of Injury	Male			Female			Total		
	Number of Deaths	Rate	Rank	Number of Deaths	Rate	Rank	Number of Deaths	Rate	Rank
Explosives	5	0.12	1	0	0.00	1	5	0.06	1
Electricity	23	0.53		1	0.02		24	0.28	
Other/Unspecified	13	0.30		3	0.07		16	0.19	
Late Effects	9	0.21		4	0.10		13	0.15	
Motor Vehicle Traffic*	923	21.44		289	6.91		1212	14.28	
Non - MV Pedal Cycle	4	0.09	4	2	0.05	3	6	0.07	4
Off-Road MV	10	0.23		0	0.00		10	0.12	
Other/Unspecified Transport	112	2.60		20	0.48		132	1.55	
Misadventure	0	0.00		1	0.02		1	0.01	
Falls	94	2.18		19	0.45		113	1.33	
Environmental	43	1.00	3	7	0.17	4	50	0.59	5
Fire, Flames and Hot Substances	51	1.18		16	0.38		67	0.79	
Drowning and Submersion	194	4.51		17	0.41		211	2.49	
Poisoning	741	17.22		198	4.73		939	11.06	
Adverse Effects	5	0.12		2	0.05		7	0.08	
Suffocation	35	0.81	2	6	0.14	2	41	0.48	3
Struck by object	52	1.21		2	0.05		54	0.64	
Machinery	56	1.30		4	0.10		60	0.71	
Cutting/Piercing	6	0.14		2	0.05		8	0.09	
Firearms	13	0.30		1	0.02		14	0.16	
Total	2389	55.50		594	14.20		2983	35.14	

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

Table 2.2b: Average Annual Age-Specific Mortality Rates, 1987-98, BC, per 100,000, by External Cause of Injury and Gender, Ages 35-44

Categories of External Cause of Injury	Male			Female			Total		
	Number of Deaths	Rate	Rank	Number of Deaths	Rate	Rank	Number of Deaths	Rate	Rank
Explosives	7	0.17	2	1	0.03	2	8	0.10	2
Electricity	14	0.35		1	0.03		15	0.19	
Other/Unspecified	17	0.42		2	0.05		19	0.24	
Late Effects	21	0.52		5	0.13		26	0.32	
Motor Vehicle Traffic*	574	14.20		203	5.10		777	9.68	
Non - MV Pedal Cycle	3	0.07	5	2	0.05	5	5	0.06	5
Off-Road MV	12	0.30		2	0.05		14	0.17	
Other/Unspecified Transport	86	2.13		16	0.40		102	1.27	
Misadventure	4	0.10		2	0.05		6	0.07	
Falls	105	2.60		25	0.63		130	1.62	
Environmental	34	0.84	4	7	0.18	3	41	0.51	4
Fire, Flames and Hot Substances	27	0.67		22	0.55		49	0.61	
Drowning and Submersion	137	3.39		12	0.30		149	1.86	
Poisoning	966	23.90		258	6.48		1224	15.25	
Adverse Effects	7	0.17		5	0.13		12	0.15	
Suffocation	38	0.94	3	9	0.23	1	47	0.59	3
Struck by object	70	1.73		6	0.15		76	0.95	
Machinery	48	1.19		2	0.05		50	0.62	
Cutting/Piercing	3	0.07		1	0.03		4	0.05	
Firearms	10	0.25		1	0.03		11	0.14	
Total	2183	54.01		582	14.62		2765	34.46	

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

Table 2.2c: Average Annual Age-Specific Mortality Rates, 1987-98, BC, per 100,000, by External Cause of Injury and Gender, Ages 45-64

Categories of External Cause of Injury	Male			Female			Total		
	Number of Deaths	Rate	Rank	Number of Deaths	Rate	Rank	Number of Deaths	Rate	Rank
Explosives	9	0.18	1	0	0.00	1	9	0.09	1
Electricity	6	0.12		0	0.00		6	0.06	
Other/Unspecified	21	0.42		5	0.10		26	0.26	
Late Effects	23	0.46		11	0.22		34	0.34	
Motor Vehicle Traffic*	643	12.75		305	6.16		948	9.49	
Non - MV Pedal Cycle	2	0.04		2	0.04		4	0.04	
Off-Road MV	10	0.20		1	0.02		11	0.11	
Other/Unspecified Transport	85	1.69		9	0.18		94	0.94	
Misadventure	4	0.08		10	0.20		14	0.14	
Falls	207	4.10		78	1.58		285	2.85	
Environmental	56	1.11	3	18	0.36	3	74	0.74	3
Fire, Flames and Hot Substances	73	1.45	4	35	0.71	5	108	1.08	5
Drowning and Submersion	140	2.78		40	0.81	4	180	1.80	4
Poisoning	599	11.88	2	171	3.45	2	770	7.70	2
Adverse Effects	22	0.44	5	21	0.42	2	43	0.43	2
Suffocation	76	1.51		26	0.53		102	1.02	
Struck by object	87	1.72		1	0.02		88	0.88	
Machinery	74	1.47		2	0.04		76	0.76	
Cutting/Piercing	5	0.10		0	0.00		5	0.05	
Firearms	8	0.16		1	0.02		9	0.09	
Total	2150	42.63		736	14.87		2886	28.88	

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

Table 2.2d: Average Annual Age-Specific Mortality Rates, 1987-98, BC, per 100,000, by External Cause of Injury and Gender, Ages 65-74

Categories of External Cause of Injury	Male			Female			Total		
	Number of Deaths	Rate	Rank	Number of Deaths	Rate	Rank	Number of Deaths	Rate	Rank
Explosives	2	0.12	2	1	0.05	1	3	0.08	2
Electricity	1	0.06		0	0.00		1	0.03	
Other/Unspecified	8	0.49		3	0.16		11	0.31	
Late Effects	11	0.67		3	0.16		14	0.39	
Motor Vehicle Traffic*	194	11.83		179	9.32		373	10.48	
Non - MV Pedal Cycle	2	0.12		0	0.00		2	0.06	
Off-Road MV	2	0.12		0	0.00		2	0.06	
Other/Unspecified Transport	18	1.10		5	0.26		23	0.65	
Misadventure	5	0.31		5	0.26		10	0.28	
Falls	244	14.88		149	7.76		393	11.04	
Environmental	18	1.10	1	2	0.10	2	20	0.56	1
Fire, Flames and Hot Substances	44	2.68	4	21	1.09	5	65	1.83	5
Drowning and Submersion	57	3.48		21	1.09	5	78	2.19	4
Poisoning	67	4.09	3	52	2.71	3	119	3.34	3
Adverse Effects	14	0.85	5	12	0.62	4	26	0.73	2
Suffocation	33	2.01		29	1.51		62	1.74	
Struck by object	5	0.31		3	0.16		8	0.22	
Machinery	13	0.79		0	0.00		13	0.37	
Cutting/Piercing	0	0.00		1	0.05		1	0.03	
Firearms	1	0.06		0	0.00		1	0.03	
Total	739	45.08		486	25.31		1225	34.41	

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

Table 2.2e: Average Annual Age-Specific Mortality Rates, 1987-98, BC, per 100,000, by External Cause of Injury and Gender, Ages 75-79

Categories of External Cause of Injury	Male			Female			Total		
	Number of Deaths	Rate	Rank	Number of Deaths	Rate	Rank	Number of Deaths	Rate	Rank
Explosives	0	0.00	2	1	0.14	2	1	0.08	2
Electricity	1	0.20		0	0.00		1	0.08	
Other/Unspecified	5	0.98		8	1.13		13	1.06	
Late Effects	10	1.95		4	0.56		14	1.15	
Motor Vehicle Traffic*	96	18.76		89	12.54		185	15.15	
Non - MV Pedal Cycle	1	0.20		0	0.00		1	0.08	
Off-Road MV	1	0.20		0	0.00		1	0.08	
Other/Unspecified Transport	4	0.78	1	0	0.00	1	4	0.33	1
Misadventure	4	0.78		7	0.99		11	0.90	
Falls	214	41.81		208	29.31		422	34.55	
Environmental	5	0.98	4	3	0.42	5	8	0.65	5
Fire, Flames and Hot Substances	15	2.93		14	1.97		29	2.37	
Drowning and Submersion	11	2.15	5	7	0.99	4	18	1.47	4
Poisoning	21	4.10	3	10	1.41		31	2.54	
Adverse Effects	11	2.15	5	16	2.26	3	27	2.21	3
Suffocation	21	4.10	3	21	2.96		42	3.44	
Struck by object	8	1.56	1	1	0.14		9	0.74	1
Machinery	7	1.37		2	0.28		9	0.74	
Cutting/Piercing	0	0.00		0	0.00		0	0.00	
Firearms	1	0.20		0	0.00		1	0.08	
Total	436	85.19		391	55.10		827	67.71	

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

Table 2.2f: Average Annual Age-Specific Mortality Rates, 1987-98, BC, per 100,000, by External Cause of Injury and Gender, Ages 80+

Categories of External Cause of Injury	Male			Female			Total		
	Number of Deaths	Rate	Rank	Number of Deaths	Rate	Rank	Number of Deaths	Rate	Rank
Explosives	1	0.20	2	0	0.00	2	1	0.07	2
Electricity	1	0.20		0	0.00		1	0.07	
Other/Unspecified	20	4.05		14	1.61		34	2.49	
Late Effects	12	2.43		27	3.10		39	2.86	
Motor Vehicle Traffic*	157	31.77		120	13.78		277	20.29	
Non - MV Pedal Cycle	1	0.20		0	0.00		1	0.07	
Off-Road MV	3	0.61		1	0.12		4	0.29	
Other/Unspecified Transport	11	2.23	1	4	0.46	1	15	1.10	1
Misadventure	7	1.42		6	0.69		13	0.95	
Falls	898	181.72		1470	168.75		2368	173.44	
Environmental	14	2.83	4	12	1.38	5	26	1.90	4
Fire, Flames and Hot Substances	24	4.86		27	3.10		51	3.74	
Drowning and Submersion	19	3.85	5	13	1.49	4	32	2.34	5
Poisoning	7	1.42		21	2.41		28	2.05	
Adverse Effects	19	3.85	3	30	3.44	3	49	3.59	3
Suffocation	51	10.32	1	77	8.84		128	9.38	
Struck by object	9	1.82		0	0.00		9	0.66	
Machinery	4	0.81		0	0.00		4	0.29	
Cutting/Piercing	1	0.20		0	0.00		1	0.07	
Firearms	0	0.00	1	0	0.00	1	0	0.00	1
Total	1259	254.77		1822	209.16		3081	225.67	

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

Transport contributed to deaths, as the fourth to fifth leading cause, among younger age groups (25-44), and especially among males. Among 65-79 year olds, Poisoning was the third to fourth leading cause of death,

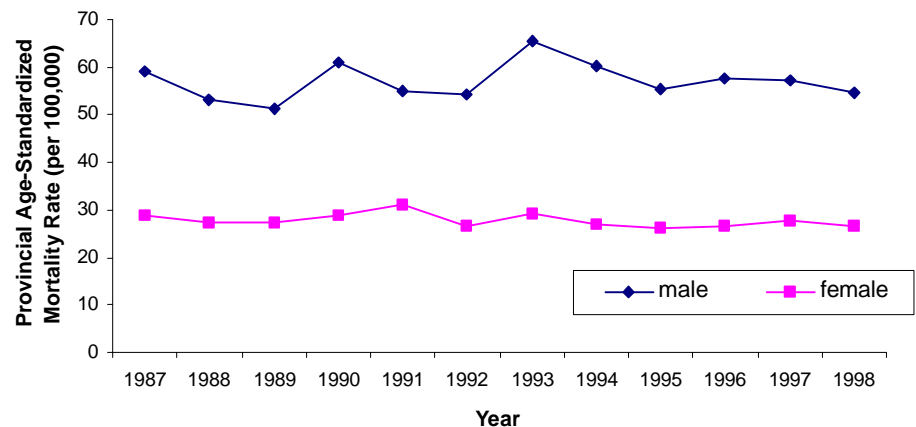
while Suffocation continued to be the third leading cause of death throughout ages 75 years and older. Fire was the fourth to fifth leading cause of death among those aged 75 years and older. [Appendices A-4a to g]

TIME TRENDS IN INJURY MORTALITY

Time Trends in the Age-Standardized Mortality Rates by Gender for All Causes of Injury

The provincial age-standardized mortality rates by year and gender are presented in *Figure 2.1*. Mortality rates were steady across the calendar years. Mortality rates among males were approximately twice as high as the mortality rates among females. [Appendix A-5].

Figure 2.1: Trends for Age Standardized Mortality Rates, Injuries, 1987-1998, BC, by Gender, Ages 25+



Trends in the Age-Specific Mortality Rates by Leading Causes and Gender

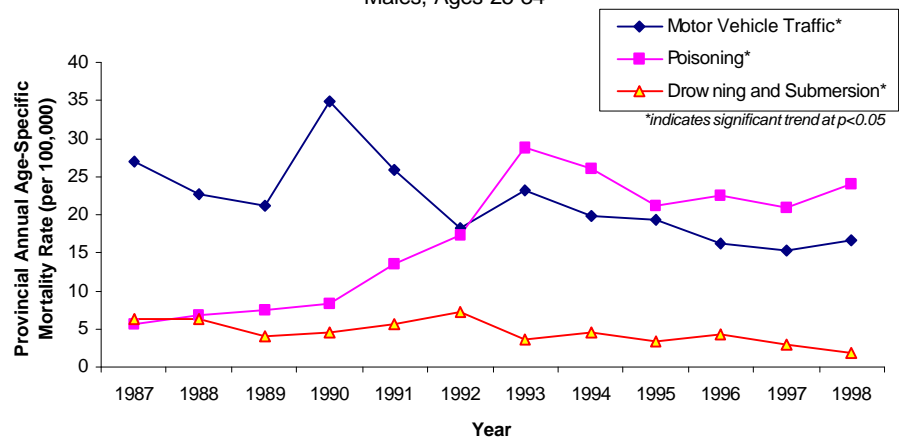
Age group 25-34 years

Males

Trends among males aged 25-34 years, for the three leading causes of death, (Motor Vehicle Traffic, Poisoning, Drowning and Submersion) are shown in *Figure 2.2*. Rates declined significantly during the twelve-year period for Motor Vehicle (MV) Traffic injuries (from 26.93 to 16.54 per 100,000) and, at a lower scale, for Drowning and Submersion (from 6.19 to 1.87 per 100,000). Rates increased significantly for Poisoning (from 5.57 to 24 per 100,000). The rapid increase in mortality due to Poisoning was seen especially between years

1990 and 1993. From 1993 to 1998, Poisoning showed the highest mortality rates among males aged 25-34 years in comparison with other causes of death in this age group. [Appendix A-6a]

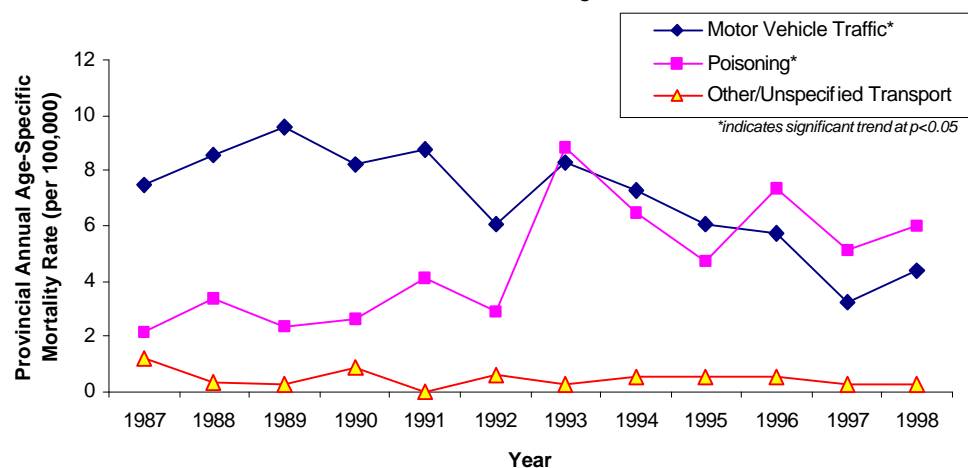
Figure 2.2: Trends for Annual Age-Specific, Mortality Rates, 1987-1998, BC, Males, Ages 25-34



Females

Mortality among 25 to 34-year-old females exhibited a similar pattern as for 25 to 34-year-old males. Downward trends in mortality due to Motor Vehicle Traffic (7.47 to 4.37 per 100,000) and Other/Unspecified Transport (1.25 to 0.27 per 100,000) were in contrast with an upward trend in mortality due to Poisoning (from 2.18 to 6.01 per 100,000). [Figure 2.3, Appendix A-6a]

Figure 2.3: Trends for Annual Age-Specific Mortality Rates, 1987-1998, BC, Females, Ages 25-34

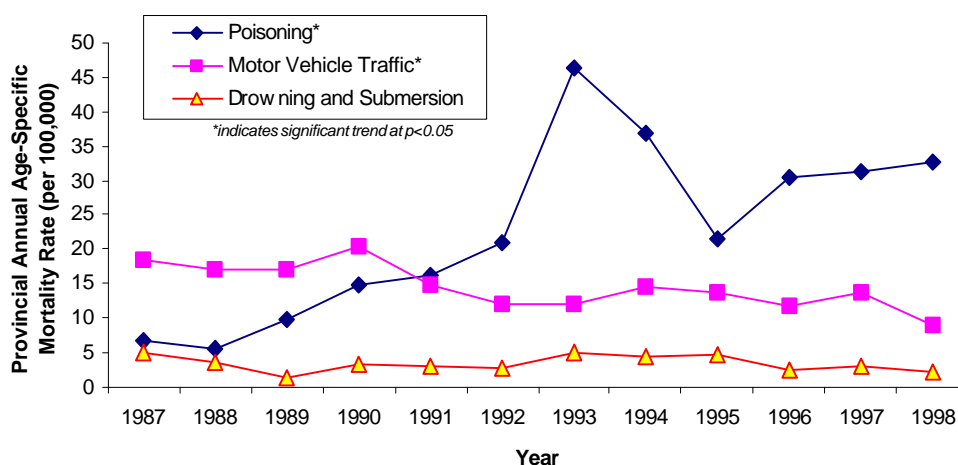


Age group 35-44

Males

The trends for mortality rates due to Poisoning, Motor Vehicle Traffic and Drowning among males aged 35-44 years are presented in Figure 2.4. Trends were similar to those for 25 to 34-year-old males. A significant upward trend for Poisoning was even more prominent (rates rising from 6.64 to 32.62 per 100,000) and Poisoning became the leading cause of death for males in this age group. MV Traffic deaths showed a significant decrease (from 18.44 per 100,000 in 1987 to 9.03 in 1998). Drowning and Submersion deaths remained steady across the years. [Appendix A-6b]

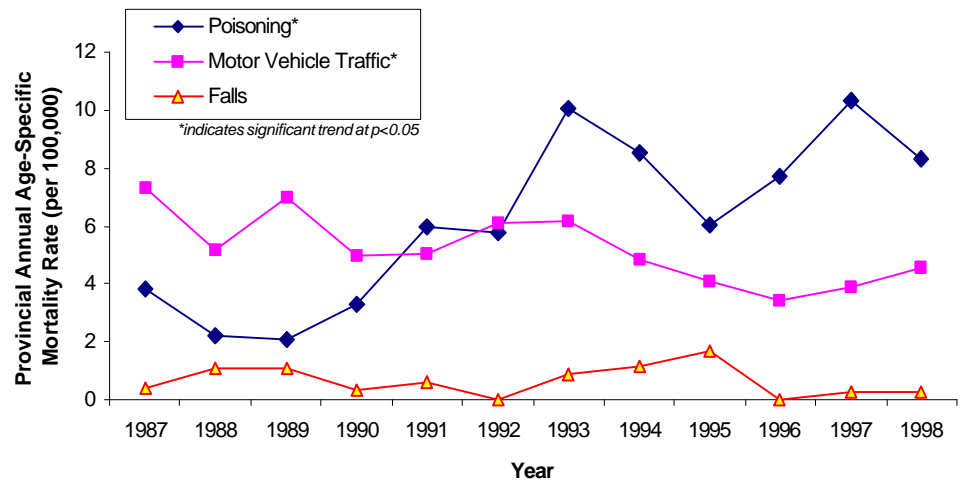
Figure 2.4: Trends for Annual Age-Specific Mortality Rates, 1987-1998, BC, Males, Ages 35-44



Females

Mortality trends for females aged 35-44 years showed a similar pattern as for males (*Figure 2.5*). A significant increase in mortality was seen for Poisoning (from 3.85 to 8.34 per 100,000), making Poisoning the first leading cause of death. MV Traffic deaths decreased significantly from 7.51 to 4.55 per 100,000 during the 12-year period. Falls were the third leading cause of death in this age group. Mortality due to Falls remained steady. [*Appendix A-6b*]

Figure 2.5: Trends for Annual Age-Specific Mortality Rates, 1987-1998, BC, Females, Ages 35-44



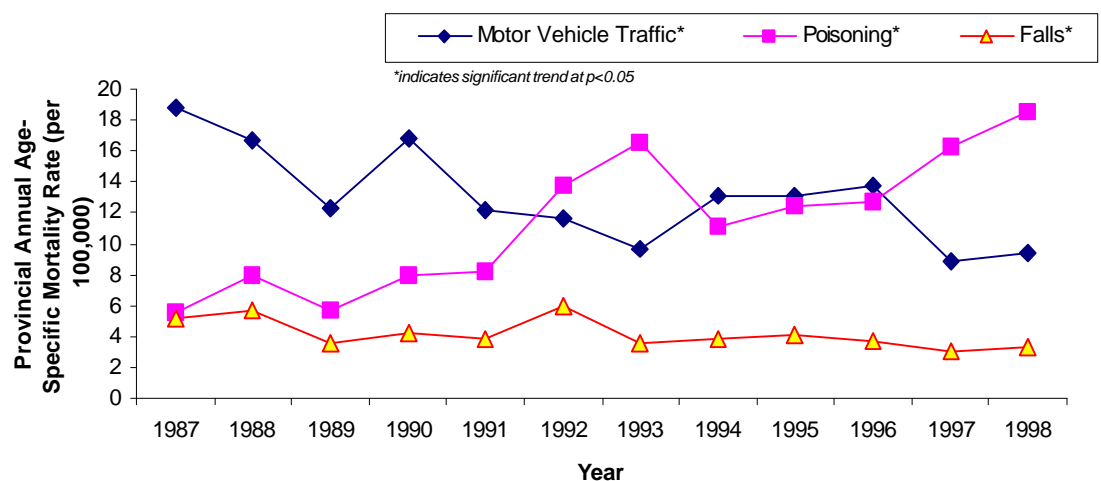
Age Group 45-64

Males

The trend in mortality due to MV Traffic, Poisoning and Falls among males aged 45-64 years is presented in *Figure 2.6*. Poisoning and Motor Vehicle injuries exhibit the same trend as in younger age groups. Mortality rates due to Poisoning increased significantly from 5.5 to 18.48 per 100,000, while mortality due to MV Traffic significantly decreased from 18.82 to 9.34 per 100,000. Although MV Traffic was the leading cause of death, Poisoning showed higher mortality rates in the last

two years 1997 and 1998. The rates were smaller for mortality due to Falls, significantly decreasing from 5.21 to 3.31 per 100,000. [*Appendix A-6c*]

Figure 2.6: Trends for Annual Age-Specific Mortality Rates, 1987-1998, BC, Males, Ages 45-64

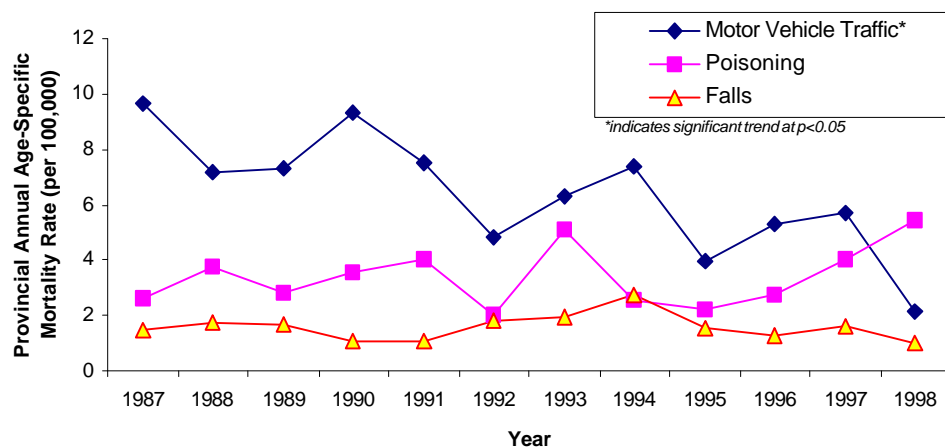


Females

Although rates were smaller, when compared to males, a similar pattern in MV Traffic injuries was seen among females aged 45-64; MV traffic injury rates decreased significantly from 9.67 to 2.15 per 100,000. In contrast, deaths due to Poisoning increased significantly from 2.64 to 5.46 per 100,000. Mortality due to Falls remained steady across the years.

[Figure 2.7, Appendix A-6c]

Figure 2.7: Trends for Annual Age-Specific Mortality Rates, 1987-1998, BC, Females, Ages 45-64



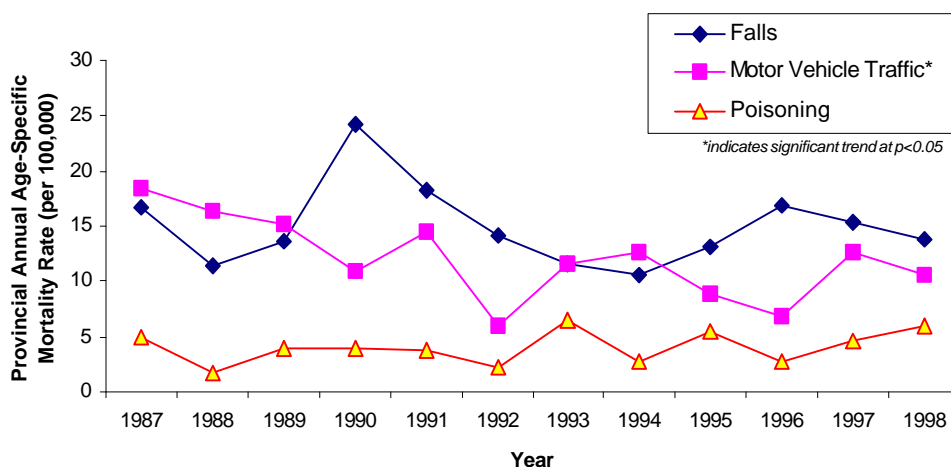
Age Group 65-74

Males

Mortality due to Falls, MV Traffic and Poisoning among males aged 65-74 years is shown in Figure 2.8. Falls emerged as the leading cause of death in this age group, showing a small nonsignificant decrease in mortality from 16.73 to 13.8 per 100,000. MV Traffic mortality followed the same pattern as in the younger age groups, with a significant decrease from 18.41 to 10.51 per 100,000. Steady mortality rates were observed for Poisoning, as it moved to the third place as a cause of death.

[Appendix A-6d]

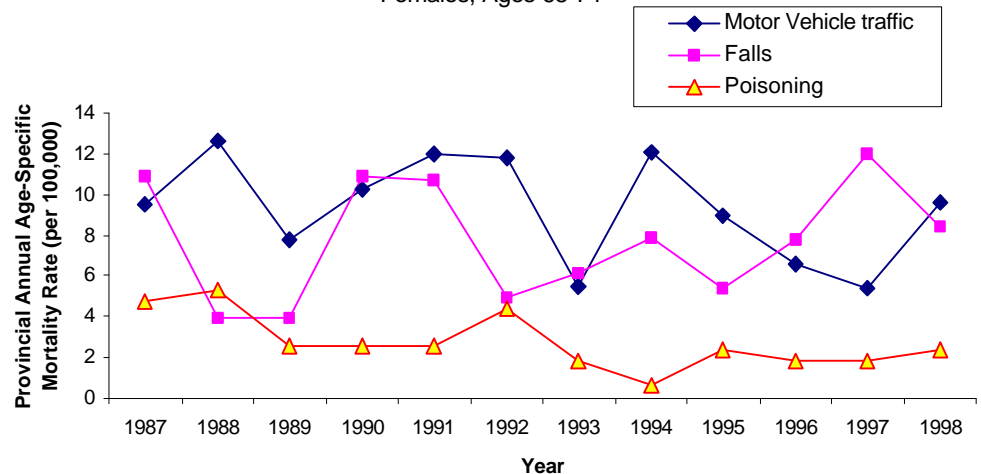
Figure 2.8: Trends for Annual Age-Specific Mortality Rates, 1987-1998, BC, Males, Ages 65-74



Females

Motor Vehicle Traffic injuries were the leading cause of death among females aged 65-74 years, with a fluctuation in mortality around 10 per 100,000. MV Traffic was followed by Falls which exhibited a similar pattern as MV Traffic. Lower rates and a significantly decreasing trend was found for Poisoning, which became the third cause of death among females aged 65-74 years. [Figure 2.9., Appendix A-6d]

Figure 2.9: Trends for Annual Age-Specific Mortality Rates, 1987-1998, BC, Females, Ages 65-74

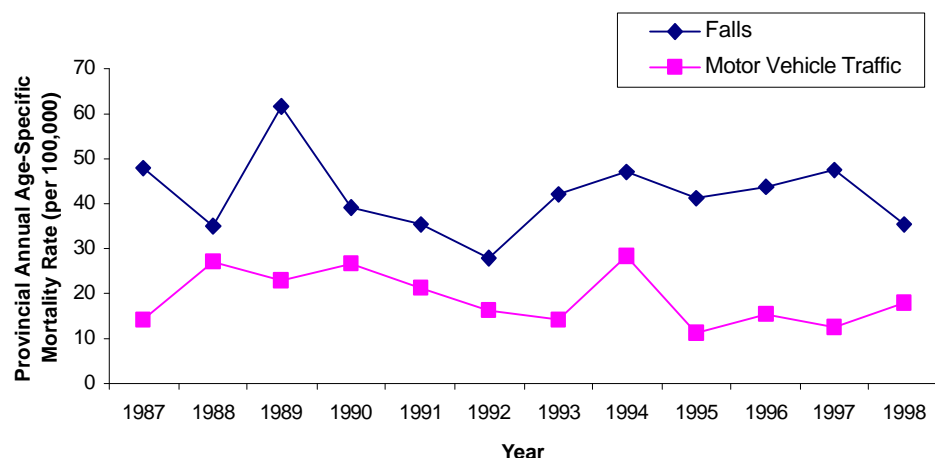


Age Group 75-79

Males

Mortality rates due to Falls and MV Traffic among males aged 75-79 years are shown in Figure 2.10. Mortality remained steady for both causes of death. Falls were the leading cause of death with rates approximately two times higher than rates for the second cause of death, MV Traffic (fluctuating around 35-40 per 100,000 and around 20 per 100,000, respectively). [Appendix A-6e]

Figure 2.10: Trends for Annual Age-Specific Mortality Rates, 1987-1998, BC, Males, Ages 75-79



Females

The first two leading causes of death for females in the 75-79 years age group were the same as for males: Falls and MV Traffic. (Figure 2.11.) Mortality due to Falls was the highest and increased significantly from 20.39 per 100,000 in 1987 to 30.17 per 100,000 in 1998. A significantly decreasing trend was found for mortality due to MV Traffic (a decrease from 12.23 to 10.06 per 100,000). [Appendix A-6e]

Age Group 80+

Males and Females

Mortality rates due to Falls, MV Traffic and Suffocation among seniors aged 80 years and older are shown in Figure 2.12 for males and in Figure 2.13 for females. In general, mortality among males was about twice the mortality among females. Even though the mortality rates for falls declined significantly (from 228.35 to 158.95 per 100,000 in males and from 182.56 to 178.37 per 100,000 in females), mortality due to Falls in the over 80 years age group was approximately ten times higher than mortality in any other age group or cause of death category. Rates of mortality from MV Traffic and Suffocation remained steady or showed a nonsignificant decline over the years. [Appendix A-6f]

Figure 2.11: Trends for Annual Age-Specific Mortality Rates, 1987-1998, BC, Females, Ages 75-79

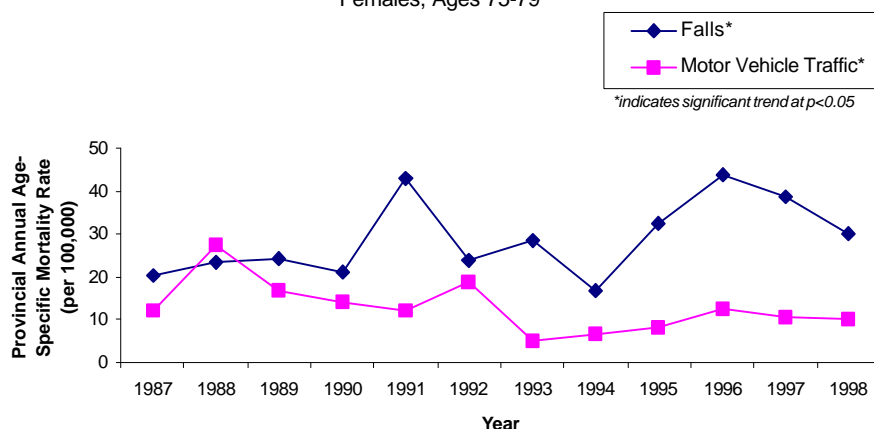


Figure 2.12: Trends for Annual Age-Specific Mortality Rates, 1987-1998, BC, Males, Ages 80+

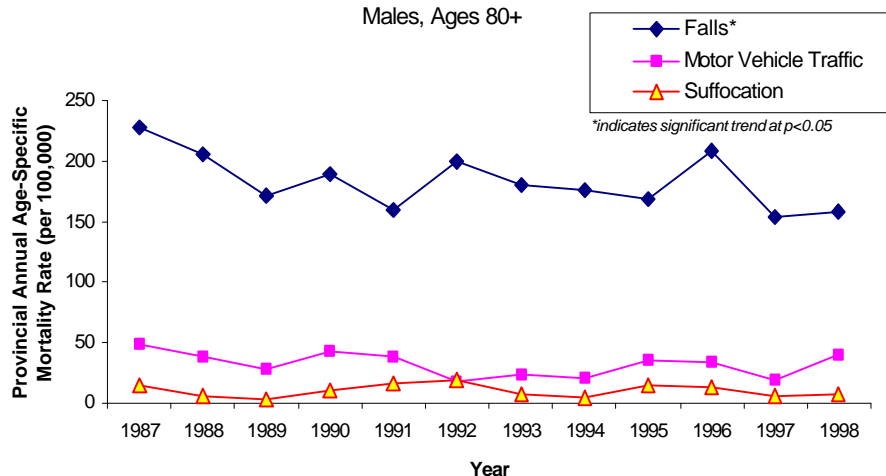
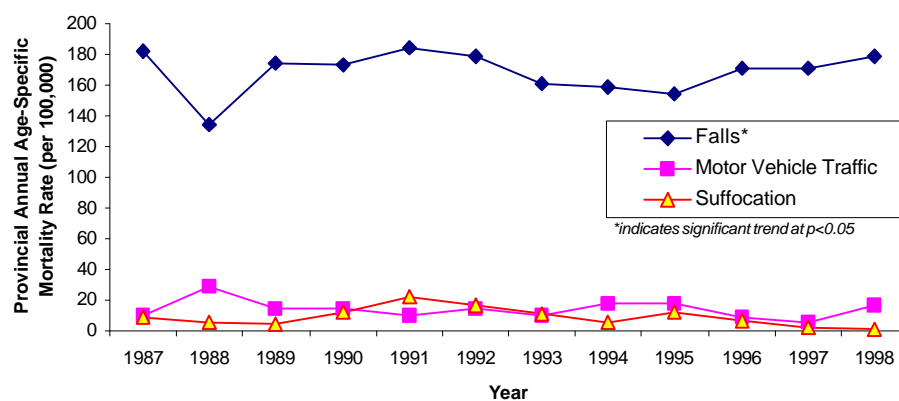


Figure 2.13: Trends for Annual Age-Specific Mortality Rates, 1987-1998, BC, Females, Ages 80+

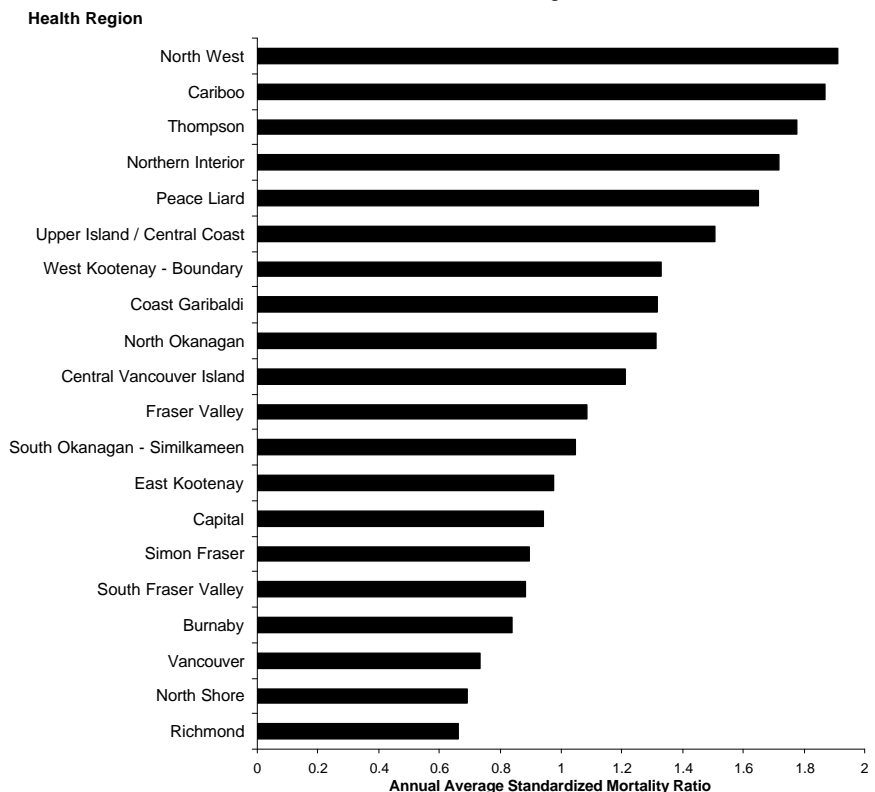


REGIONAL VARIATIONS IN INJURY MORTALITY

Males Ages 25+

The overall pattern of regional variations in standardized mortality ratios (SMRs) for males is shown in *Figure 2.14*. Compared to the provincial rate, higher mortality rates were found in the North West Region (1.91), followed by the Cariboo Region (1.87), Thompson (1.78), Northern Interior (1.72) and the Peace Liard Region (1.65). Those five regions had significantly higher mortality in comparison with the provincial rates. The lowest SMR was found in Richmond (0.66), followed by North Shore (0.84) and Vancouver (0.74). [Appendix A-7]

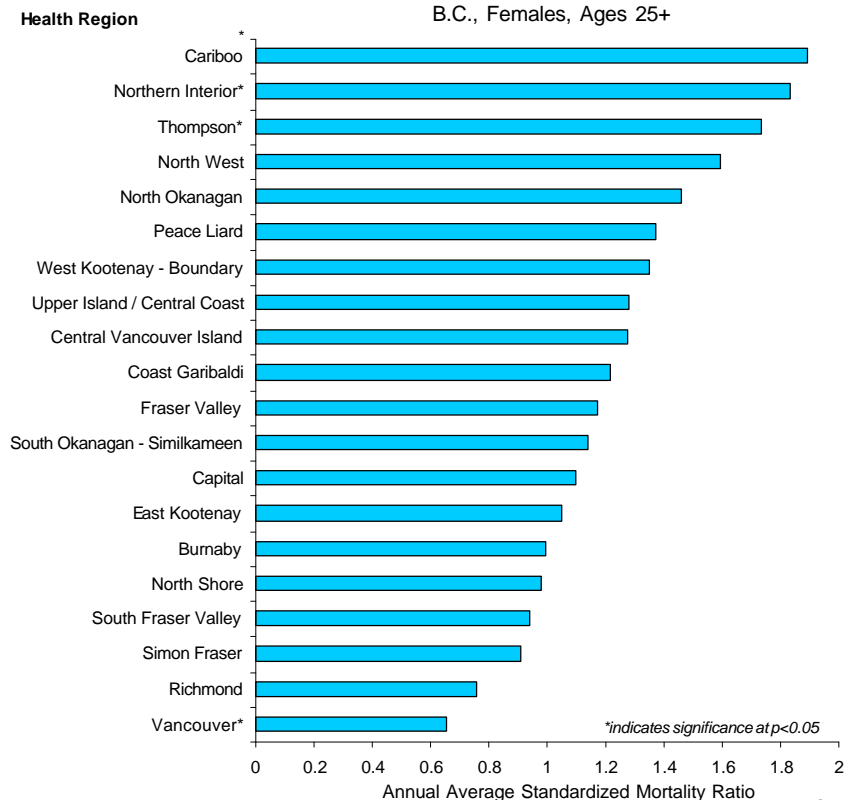
Figure 2.14: Standardized Mortality Ratios by Regions, 1987-1998, B.C., Males, Ages 25+



Females Ages 25+

Among females aged 25 years old and over, statistically significant SMRs were found in the Cariboo Region (1.89), Northern Interior (1.83) and the Thompson Region (1.74). Vancouver (0.66) had the lowest statistically significant SMR. [Figure 2.15, Appendix A-7].

Figure 2.15: Standardized Mortality Ratios by Regions, 1987-1998, B.C., Females, Ages 25+



Males Ages 25-44

The pattern of regional variations for males aged 25-44 years is presented in *Figure 2.16*. Compared to the provincial rate, the highest mortality rates were found in the North West, Thompson, Cariboo, Upper Island/Central Coast and Northern Interior Health Regions with SMRs of 1.9, 1.92, 1.74, 1.71 and 1.58, respectively. SMRs for those regions except Cariboo were significantly higher than 1. The lowest SMRs were found in the North Shore Region (0.55), Richmond (0.56), Vancouver (0.75) and Burnaby (0.8). Vancouver had a significantly lower mortality for males in comparison with the provincial average for males of the same age group. [Appendix A-8a]

Females Ages 25-44

The highest SMR among females in the 25-44 years age group was found in the Cariboo Region (2.37), followed by the Thompson Health Region (1.95) and the Northern Interior (1.83). The lowest SMRs were found in Richmond (0.47), North Shore Region (0.67) and Burnaby (0.70). [Figure 2.17, Appendix A-8a]

Figure 2.16: Standardized Mortality Ratios by Regions, 1987-1998, B.C., Males, Ages 25-44

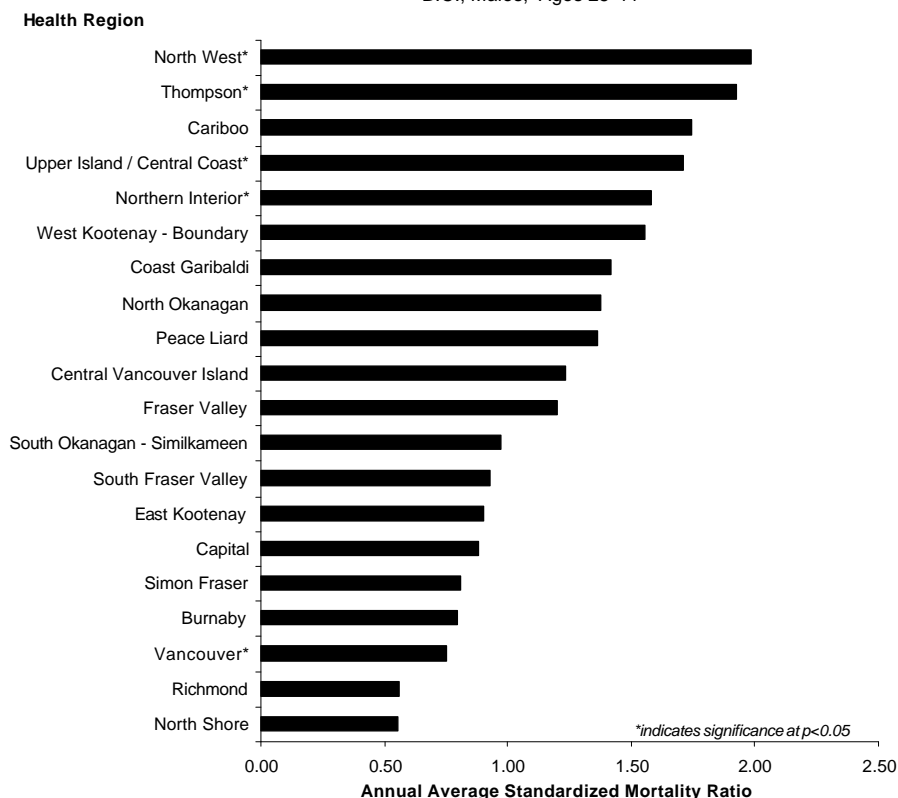
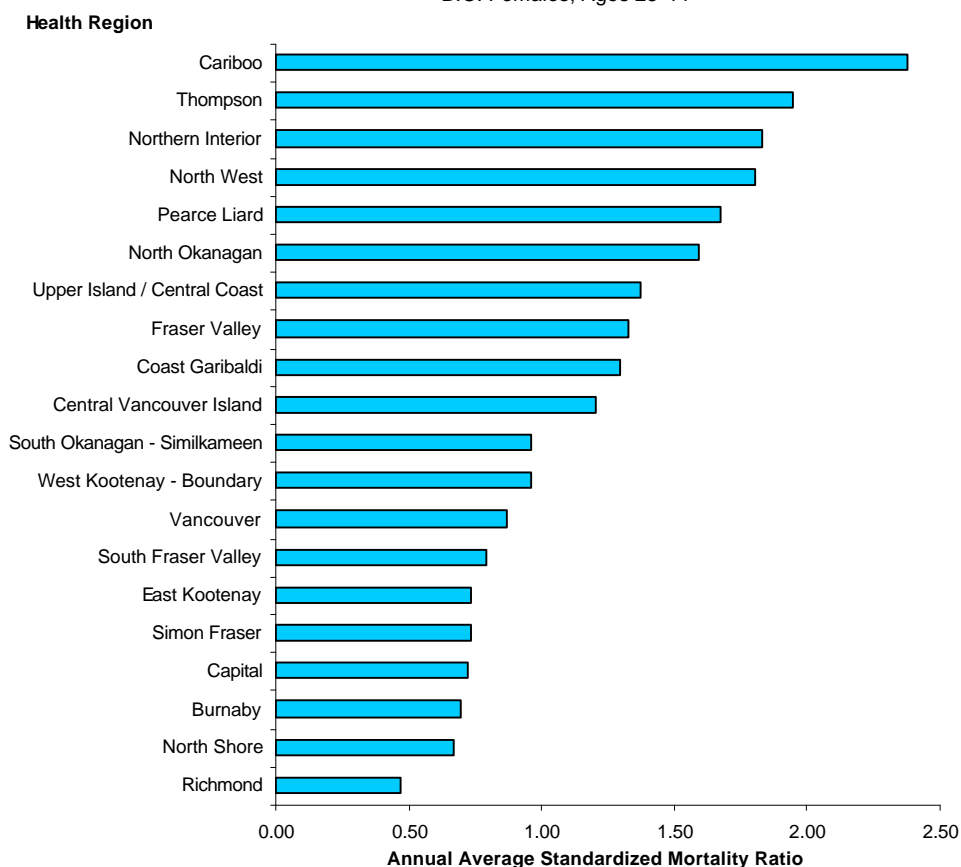
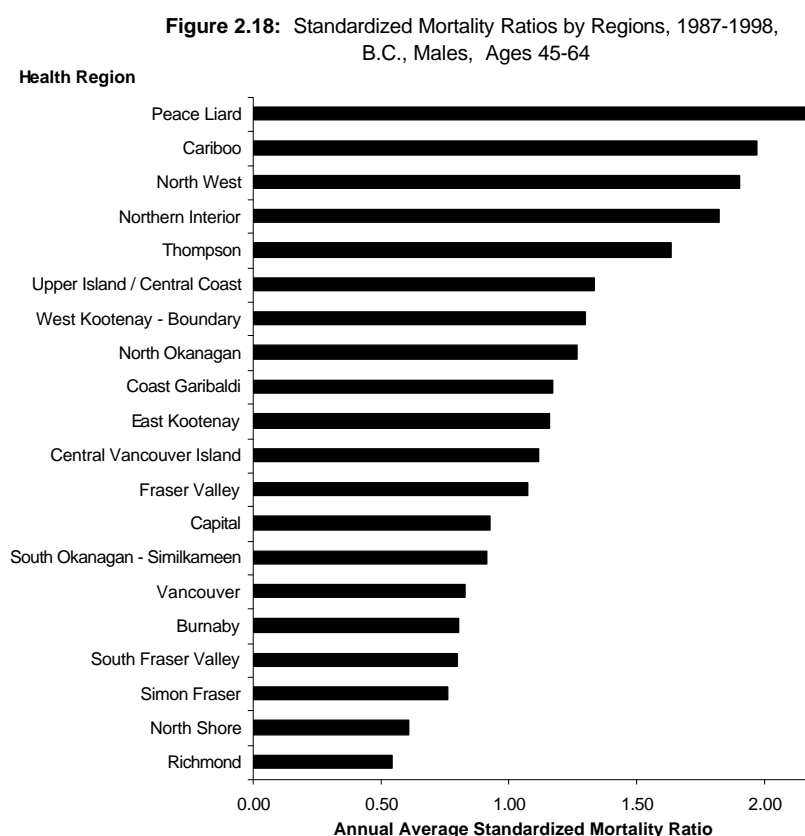


Figure 2.17: Standardized Mortality Ratios by Regions, 1987-1998, B.C. Females, Ages 25-44



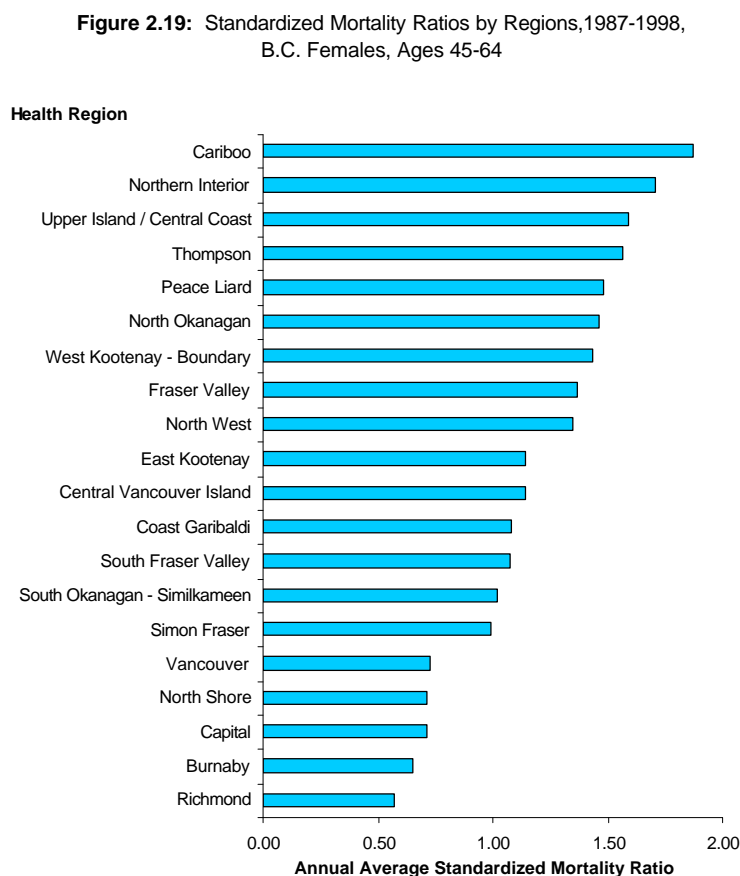
Males Ages 45-64

The regional variations in SMRs for males aged 45-64 are shown in *Figure 2.18*. The highest SMRs were found in the Peace Liard Region (2.21), followed by the Cariboo Health Region (1.97) and the North West Region (1.90). The lowest SMRs were found in Richmond (0.54), North Shore region (0.61) and Simon Fraser (0.76). [Appendix A-8b]



Females Ages 45-64

Among females aged 45-64 the highest SMRs were found in the Cariboo Health Region (1.87), Northern Interior (1.71) and the Upper Island/Central Coast Region (1.59). The lowest SMRs were found in Richmond (0.57), Burnaby (0.65), and the Capital Region (0.72) as well as the North Shore (0.72). [Figure 2.19, Appendix A-8b]



Males Ages 65-79

A similar pattern was found for males in the 65-79 years age group, as for males aged 45-64 years. Compared to the provincial rate, the highest mortality rate was found in the Cariboo, North Interior, Peace Liard and North West Regions. SMRs were 2.59, 1.96, 1.92 and 1.77, respectively. The lowest SMRs were found in Vancouver (0.67), North Shore (0.76), Burnaby (0.76), and Richmond (0.82). [Figure 2.20, Appendix A-8c]

Figure 2.20: Standardized Mortality Ratios by Regions, 1987-1998, B.C., Males, Ages 65-79

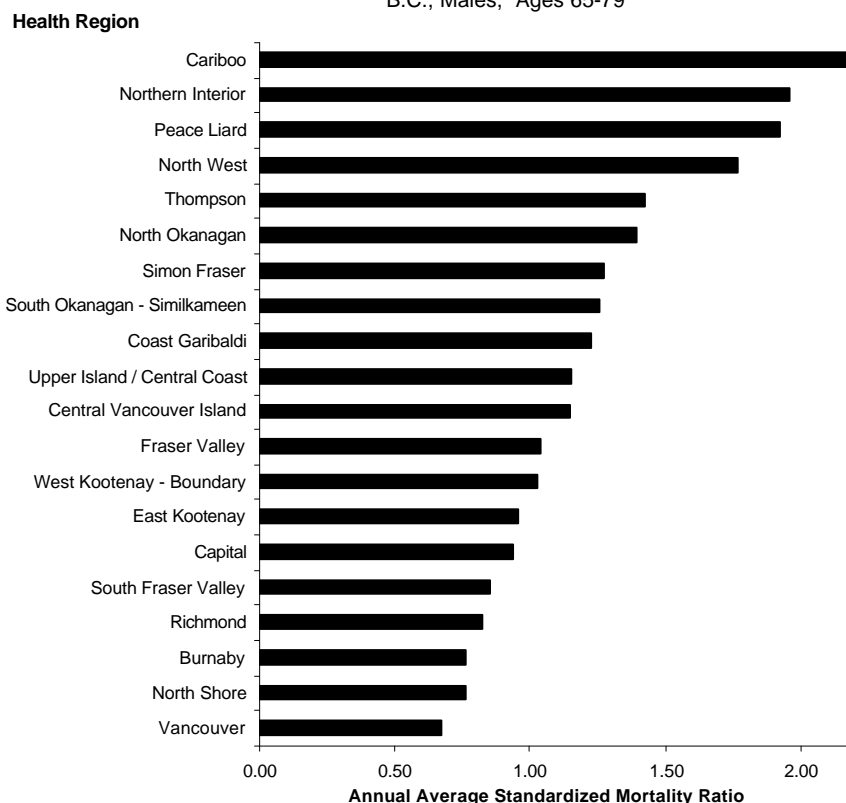
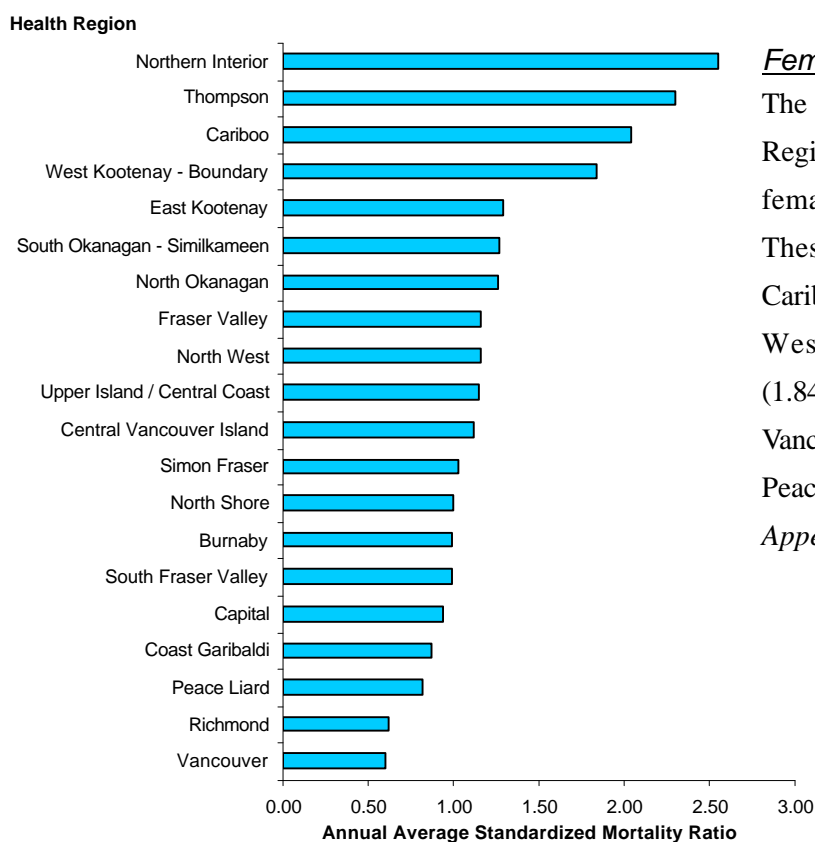


Figure 2.21: Standardized Mortality Ratios by Regions, 1987-1998, B.C. Females, Ages 65-79



Females Ages 65-79

The Northern Interior and Thompson Region had the highest SMRs among females aged 65-79 (2.55 and 2.30). These regions were followed by the Cariboo Health Region (2.04), and the West Kootenay-Boundary Region (1.84). The lowest SMRs were found in Vancouver (0.60), Richmond (0.62), and Peace Liard (0.82). [Figure 2.21, Appendix A-8c]

Males Ages 80+

The pattern of regional variations for males aged 80 years old and over is shown in *Figure 2.22*. Compared to the province, high mortality rates were found in the Northern Interior (2.32), followed by the Peace Liard Region (1.94) and the Thompson Region (1.91). The lowest SMRs were found in Vancouver (0.60), Fraser Valley region (0.81) and South Fraser Valley (0.89) as well as the East Kootenay Region (0.89).

[Appendix A-8d]

Figure 2.22: Standardized Mortality Ratios by Regions, 1987-1998, B.C., Males, Ages 80+

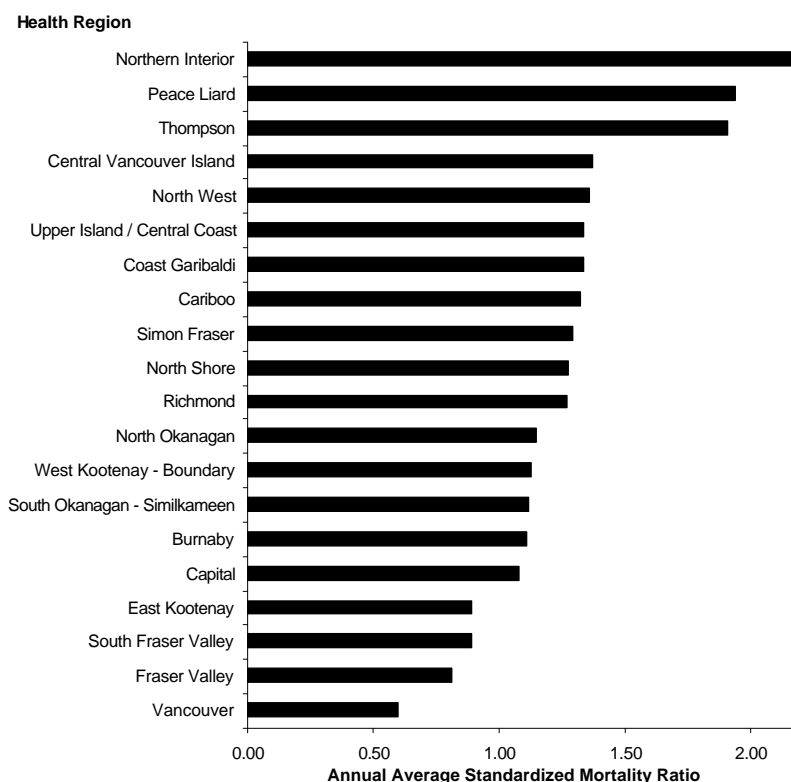
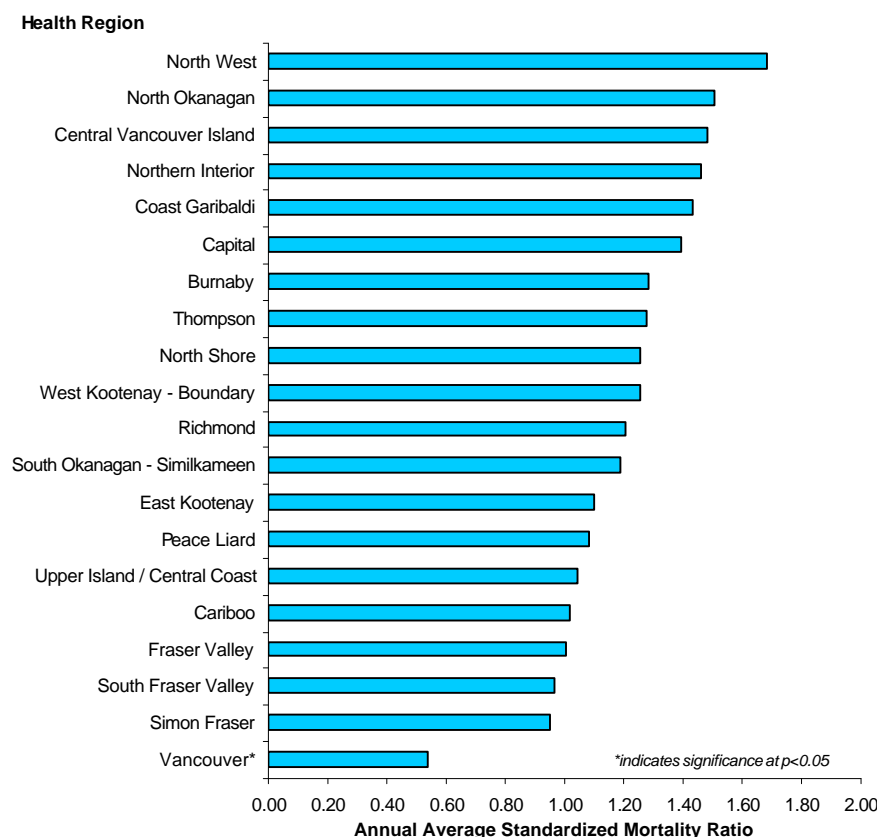


Figure 2.23: Standardized Mortality Ratios by Regions, 1987-1998, B.C. Females, Ages 80+

**Females Ages 80+**

Among females aged 80 years old and over the highest SMRs were found in the North West Region (1.69), North Okanagan (1.50) and the Central Vancouver Island Region (1.49). The lowest SMR was found for Vancouver (0.54). [Figure 2.23, Appendix A-8d]

HOSPITAL SEPARATIONS DUE TO UNINTENTIONAL INJURIES

Results

INJURY HOSPITAL SEPARATIONS BY AGE AND GENDER

The average annual age-specific hospital separation rates per 100,000 as well as the total number of hospital separations from 1987 to 1998 are presented in *Table 3.1*. There was a total of 405,165 hospital separations due to unintentional injuries among adults

Table 3.1: 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

and seniors, aged 25 years and older, (25+) during the 12 year period from 1987 to 1998. Injuries among males were significantly higher than among females in age groups 25-79 ($p < .05$). Hospital separation rates tended

to be higher in females over 80 years old (80+) in comparison with males of the same age. The difference, however, was not significant. See *Appendix B-1* for 95% Confidence Intervals.

LEADING CAUSES OF INJURY HOSPITAL SEPARATION

The average annual age-specific hospital separation rates due to injury by external causes of injury are shown in *Tables 3.2a-f*.

Falls were the first leading cause of hospital separations among males and females aged 35 years and older. Falls were also among the first three leading causes of hospital separations in young adults aged 25-34. Motor Vehicle Traffic injuries were responsible for a heavy toll of hospitalizations. They were the first leading cause of injury among males and females in the 25-34 years age group, and remained the third/fourth leading cause of injury for adults aged 35 years and over.

Adverse Effects played an important role as a cause of hospitalization especially among adults over 45 years of age (the third leading cause of injuries) and among

females aged 25-44 years (being the third to fourth leading cause of injuries). Misadventure was the fourth leading cause of injury among males and females aged 65 years and over. Late Effects appeared among the first five leading causes of injuries among adults aged 25 to 64 years. Poisoning was among the first five leading causes of injury in adults over 75 years of age. Being Struck by an Object was also an important factor in injuries among males aged 25 to 64 years.

Note that the hospital separation rates due to Falls increased dramatically with age. Falls increased two to three times between the age groups 45-64 and 65-74. Hospital separation rates due to Falls further doubled between age group 65-74 and 75-79 and between age groups 75-79 and 80+. [*Appendix B-2a-f*]

Table 3.2a: Average Annual Hospital Separation Rates, 1987-98, BC, per 100,000, by External Cause of Injury and Gender, Ages 25-34

Categories of External Cause of Injury	Male			Female			Total		
	Number of Separations	Rate	Rank	Number of Separations	Rate	Rank	Number of Separations	Rate	Rank
Explosives	297	6.90	4	35	0.84	5	332	3.91	5
Electricity	163	3.79		6	0.14		169	1.99	
Overexertion	3285	76.32		1274	30.44		4559	53.71	
Other/Unspecified	632	14.68		338	8.08		970	11.43	
Late Effects	3156	73.32	5	1350	32.26	1	4506	53.08	1
Motor Vehicle Traffic	10676	248.03	1	4968	118.72		15644	184.29	
Non - MV Pedal Cycle	908	21.10	2	342	8.17		1250	14.73	
Off-Road Vehicle	991	23.02		136	3.25		1127	13.28	
Other/Unspecified Transport	1082	25.14		690	16.49		1772	20.87	2
Misadventure	328	7.62		1706	40.77	4	2034	23.96	
Falls	9574	222.43	2	4837	115.59	2	14411	169.76	2
Environmental	697	16.19		391	9.34		1088	12.82	
Fire, Flames and Hot Substances	931	21.63		273	6.52		1204	14.18	
Machinery	2124	49.35		111	2.65		2235	26.33	
Drowning and Submersion	137	3.18	3	29	0.69	3	166	1.96	4
Poisoning	1236	28.72		897	21.44		2133	25.13	
Adverse Effects	2008	46.65		4052	96.83		6060	71.39	
Suffocation	83	1.93		37	0.88		120	1.41	
Foreign Body	390	9.06	3	136	3.25	3	526	6.20	3
Struck by Object	5762	133.87		988	23.61		6750	79.52	
Cutting/Piercing	2944	68.40		703	16.80		3647	42.96	
Firearms	154	3.58		23	0.55		177	2.09	
Total	47558	1104.9		23322	557.3		70880	835.0	

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

Table 3.2b: Average Annual Hospital Separation Rates, 1987-98, BC, per 100,000, by External Cause of Injury and Gender, Ages 35-44

Categories of External Cause of Injury	Male			Female			Total		
	Number of Separations	Rate	Rank	Number of Separations	Rate	Rank	Number of Separations	Rate	Rank
Explosives	214	5.29	4	26	0.65	5	240	2.99	5
Electricity	123	3.04		4	0.10		127	1.58	
Overexertion	2710	67.05		1172	29.43		3882	48.38	
Other/Unspecified	633	15.66		374	9.39		1007	12.55	
Late Effects	3016	74.62	2	1186	29.78	3	4202	52.37	2
Motor Vehicle Traffic	6814	168.58		3451	86.66		10265	127.93	
Non - MV Pedal Cycle	686	16.97		275	6.91		961	11.98	
Off-Road Vehicle	549	13.58		89	2.24		638	7.95	
Other/Unspecified Transport	973	24.07	1	638	16.02	4	1611	20.08	1
Misadventure	574	14.20		1694	42.54		2268	28.26	
Falls	9703	240.06		5875	147.54		15578	194.14	
Environmental	591	14.62		419	10.52		1010	12.59	
Fire, Flames and Hot Substances	677	16.75	5	254	6.38	2	931	11.60	3
Machinery	1771	43.82		99	2.49		1870	23.30	
Drowning and Submersion	105	2.60		24	0.60		129	1.61	
Poisoning	1181	29.22		948	23.81		2129	26.53	
Adverse Effects	2840	70.26	3	4477	112.43	2	7317	91.19	4
Suffocation	99	2.45		61	1.53		160	1.99	
Foreign Body	371	9.18		156	3.92		527	6.57	
Struck by Object	4074	100.79		598	15.02		4672	58.22	
Cutting/Piercing	1798	44.48	3	500	12.56	3	2298	28.64	3
Firearms	92	2.28		15	0.38		107	1.33	
Total	39594	979.6		22335	560.9		61929	771.8	

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

Table 3.2c: Average Annual Hospital Separation Rates, 1987-98, BC, per 100,000, by External Cause of Injury and Gender, Ages 45-64

Categories of External Cause of Injury	Male			Female			Total		
	Number of Separations	Rate	Rank	Number of Separations	Rate	Rank	Number of Separations	Rate	Rank
Explosives	224	4.44	4	26	0.53	5	250	2.50	5
Electricity	103	2.04		2	0.04		105	1.05	
Overexertion	2342	46.43		1345	27.17		3687	36.89	
Other/Unspecified	873	17.31		598	12.08		1471	14.72	
Late Effects	3157	62.59		1418	28.64		4575	45.78	
Motor Vehicle Traffic	6352	125.94	3	4567	92.25	3	10919	109.25	3
Non - MV Pedal Cycle	515	10.21	1	373	7.53	4	888	8.89	4
Off-Road Vehicle	442	8.76		90	1.82		532	5.32	
Other/Unspecified Transport	1037	20.56		506	10.22		1543	15.44	
Misadventure	2382	47.23		2451	49.51		4833	48.36	
Falls	16145	320.09		16014	323.48		32159	321.77	
Environmental	785	15.56	2	526	10.63	2	1311	13.12	2
Fire, Flames and Hot Substances	800	15.86		356	7.19		1156	11.57	
Machinery	1961	38.88		111	2.24		2072	20.73	
Drowning and Submersion	118	2.34		36	0.73		154	1.54	
Poisoning	1274	25.26		1077	21.76		2351	23.52	
Adverse Effects	8527	169.06	5	10734	216.83	2	19261	192.72	2
Suffocation	260	5.15		174	3.51		434	4.34	
Foreign Body	581	11.52		315	6.36		896	8.97	
Struck by Object	3116	61.78		604	12.20		3720	37.22	
Cutting/Piercing	1646	32.63		401	8.10		2047	20.48	
Firearms	63	1.25	1	9	0.18	1	72	0.72	1
Total	52703	1044.9		41733	843.0		94436	944.9	

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

Table 3.2d: Average Annual Hospital Separation Rates, 1987-98, BC, per 100,000, by External Cause of Injury and Gender, Ages 65-74

Categories of External Cause of Injury	Male			Female			Total		
	Number of Separations	Rate	Rank	Number of Separations	Rate	Rank	Number of Separations	Rate	Rank
Explosives	27	1.65	5	4	0.21	3	31	0.87	5
Electricity	1	0.06		0	0.00		1	0.03	
Overexertion	556	33.91		655	34.11		1211	34.02	
Other/Unspecified	394	24.03		410	21.35		804	22.58	
Late Effects	760	46.36		577	30.04		1337	37.56	
Motor Vehicle Traffic	2134	130.17	3	2410	125.49	3	4544	127.64	3
Non - MV Pedal Cycle	160	9.76	4	104	5.42	4	264	7.42	4
Off-Road Vehicle	93	5.67		21	1.09		114	3.20	
Other/Unspecified Transport	199	12.14		124	6.46		323	9.07	
Misadventure	2103	128.27		1707	88.88		3810	107.02	
Falls	10210	622.77		17803	927.00		28013	786.89	
Environmental	249	15.19	1	188	9.79	1	437	12.28	1
Fire, Flames and Hot Substances	267	16.29		192	10.00		459	12.89	
Machinery	389	23.73		18	0.94		407	11.43	
Drowning and Submersion	46	2.81		19	0.99		65	1.83	
Poisoning	613	37.39		717	37.33		1330	37.36	
Adverse Effects	8624	526.03	2	10083	525.02	2	18707	525.49	2
Suffocation	205	12.50		154	8.02		359	10.08	
Foreign Body	288	17.57		214	11.14		502	14.10	
Struck by Object	455	27.75		259	13.49		714	20.06	
Cutting/Piercing	366	22.32		125	6.51		491	13.79	
Firearms	8	0.49	1	3	0.16	1	11	0.31	1
Total	28147	1716.9		35787	1863.4		63934	1795.9	

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

Table 3.2e: Average Annual Hospital Separation Rates, 1987-98, BC, per 100,000, by External Cause of Injury and Gender, Ages 75-79

Categories of External Cause of Injury	Male			Female			Total		
	Number of Separations	Rate	Rank	Number of Separations	Rate	Rank	Number of Separations	Rate	Rank
Explosives	6	1.17	3	4	0.56	3	10	0.82	3
Electricity	5	0.98		0	0.00		5	0.41	
Overexertion	190	37.12		338	47.63		528	43.23	
Other/Unspecified	223	43.57		254	35.80		477	39.05	
Late Effects	248	48.45		330	46.51		578	47.32	
Motor Vehicle Traffic	908	177.41		1107	156.01		2015	164.97	
Non - MV Pedal Cycle	53	10.36		26	3.66		79	6.47	
Off-Road Vehicle	37	7.23		8	1.13		45	3.68	
Other/Unspecified Transport	53	10.36		51	7.19		104	8.51	
Misadventure	806	157.48	4	788	111.05	4	1594	130.51	4
Falls	5932	1159.00	1	13876	1955.51	1	19808	1621.74	1
Environmental	106	20.71	5	94	13.25	5	200	16.37	5
Fire, Flames and Hot Substances	106	20.71		117	16.49		223	18.26	
Machinery	84	16.41		11	1.55		95	7.78	
Drowning and Submersion	13	2.54		5	0.70		18	1.47	
Poisoning	287	56.07		447	62.99		734	60.09	
Adverse Effects	4375	854.79		5759	811.60		10134	829.70	
Suffocation	110	21.49		88	12.40		198	16.21	
Foreign Body	117	22.86		99	13.95		216	17.68	
Struck by Object	132	25.79		170	23.96		302	24.73	
Cutting/Piercing	88	17.19	2	46	6.48	2	134	10.97	2
Firearms	8	1.56		1	0.14		9	0.74	
Total	13887	2713.2		23619	3328.6		37506	3070.7	

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

Table 3.2f: Average Annual Hospital Separation Rates, 1987-98, BC, per 100,000, by External Cause of Injury and Gender, Ages 80+

Categories of External Cause of Injury	Male			Female			Total		
	Number of Separations	Rate	Rank	Number of Separations	Rate	Rank	Number of Separations	Rate	Rank
Explosives	9	1.82	3	2	0.23	3	11	0.81	3
Electricity	2	0.40		1	0.11		3	0.22	
Overexertion	213	43.10		541	62.10		754	55.23	
Other/Unspecified	254	51.40		467	53.61		721	52.81	
Late Effects	279	56.46		539	61.87		818	59.91	
Motor Vehicle Traffic	985	199.33		1196	137.30		2181	159.75	
Non - MV Pedal Cycle	57	11.53		20	2.30		77	5.64	
Off-Road Vehicle	32	6.48		29	3.33		61	4.47	
Other/Unspecified Transport	46	9.31		74	8.49		120	8.79	
Misadventure	672	135.99	4	748	85.87	4	1420	104.01	4
Falls	13688	2769.91	1	39433	4526.74	1	53121	3890.85	1
Environmental	133	26.91	5	165	18.94	5	298	21.83	5
Fire, Flames and Hot Substances	153	30.96		212	24.34		365	26.73	
Machinery	58	11.74		6	0.69		64	4.69	
Drowning and Submersion	7	1.42		4	0.46		11	0.81	
Poisoning	398	80.54		615	70.60		1013	74.20	
Adverse Effects	5313	1075.14		8762	1005.84		14075	1030.92	
Suffocation	164	33.19		200	22.96		364	26.66	
Foreign Body	172	34.81		200	22.96		372	27.25	
Struck by Object	151	30.56		344	39.49		495	36.26	
Cutting/Piercing	80	16.19	2	54	6.20	2	134	9.81	2
Firearms	2	0.40		0	0.0		2	0.15	
Total	22868	4627.6		53612	6154.4		76480	5601.8	

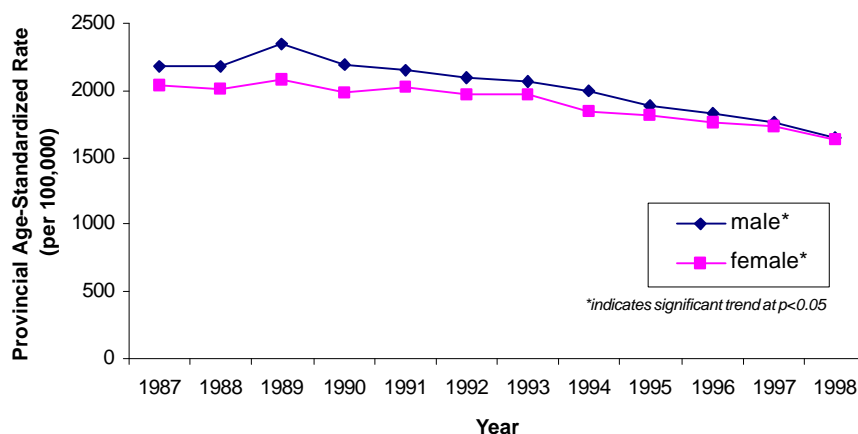
* Motor Vehicle Traffic includes MV - Occupant, Pedal Cycle Rider, Pedestrian, Motorcyclist

TRENDS IN INJURY HOSPITAL SEPARATION

Trends for All Causes of Unintentional Injury

The provincial age-standardized hospital separation rates for each year by gender are presented in *Figure 3.1*. A statistically significant downward trend was found for both males and females ($p < .05$). Among males 25 years old and over, hospital separation rates dropped by 24 percent, from 2177 per 100,000 in 1987 to 1643 per 100,000 in 1998. Rates dropped by 19% among females, with rates slowly decreasing across the years from 2036 to 1640 per 100,000. The downward trend was more pronounced in males so that male injury rates which had a significant

Figure 3.1: Trends for Age Standardized Hospital Separation Rates, Injuries, 1987-1998, BC, by Gender, Ages 25+



difference to female rates in 1987 to 1996 had no significant difference in 1997 and 1998. See *Appendix B-3a* for 95% Confidence Intervals.

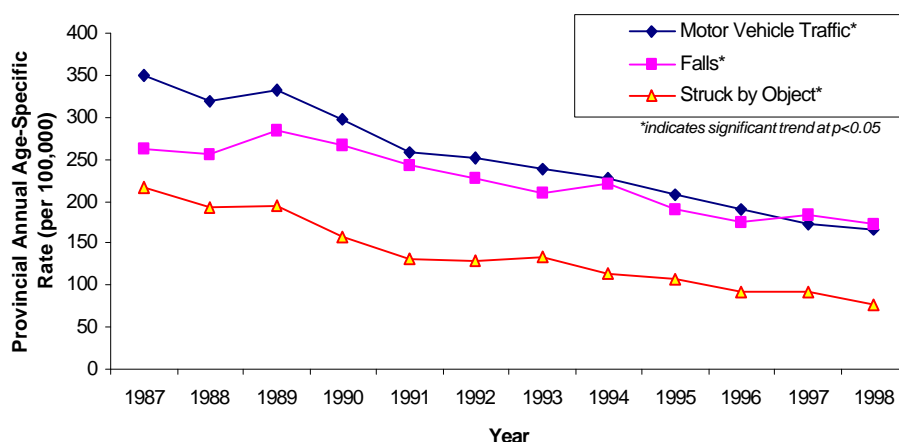
Trends by Leading Causes, Age and Gender

Age Group 25-34

Males

The trends for age-specific hospital separation rates among males in the 25-34 years age group are presented in *Figure 3.2a,b*. Significant downward trends were found for all leading causes of injury ($p < .05$). The highest rates were due to MV Traffic, they decreased from 349 to 167 per 100,000. MV Traffic was followed by Falls with a decreasing rate (from 262 per 100,000 to 172 per 100,000). While in 1987, rates for all three causes were significantly different, by 1995, there was no significant difference between Motor Ve-

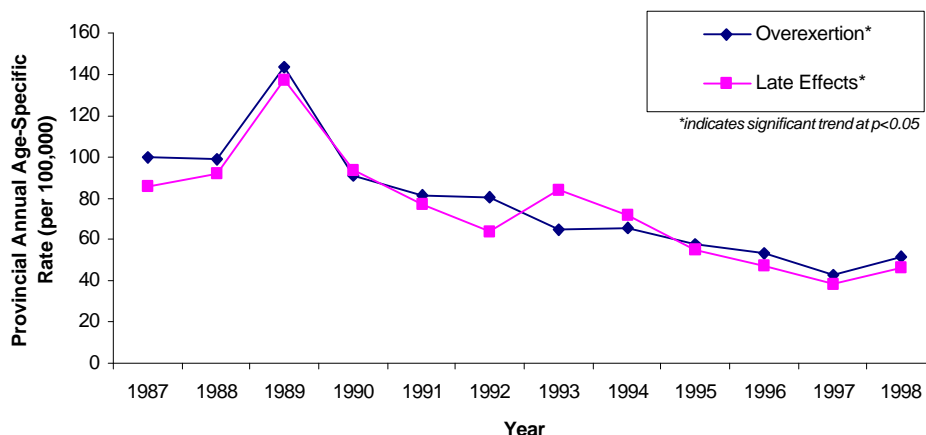
Figure 3.2a: Trends for Annual Age-Specific Hospital Separation Rates, 1987-1998, BC, Males, Ages 25-34



hicle Traffic rates and Falls rates. Being Struck by an Object, Over-Exertion and Late Effects were among the first five leading causes of injuries among males

aged 25-34 years, each showing a significant decline (from 215 to 77 per 100,000; from 100 to 51 per 100,000 and from 85 to 46 per 100,000; respectively).
[Appendix B-3b]

Figure 3.2b: Trends for Annual Age-Specific Hospital Separation Rates, 1987-1998, BC, Males, Ages 25-34



Females

Significant downward trends in hospital separation rates due to Motor Vehicle Traffic, Falls and Adverse Effects were found among females aged 25-34 ($p < .05$) (Figure 3.3a,b). Injury rates due to MV Traffic and Falls declined from 152 and 132 per 100,000 in 1987 to 85 per 100,000 in 1998. An overall significant upward trend was observed in Misadventures from 1987 to 1993 and after 1993 a slight decrease was noticed. Late Effects showed a significant decrease ($p < .05$).

[Appendix B-3c]

Figure 3.3a: Trends for Annual Age-Specific Hospital Separation Rates, 1987-1998, BC, Females, Ages 25-34

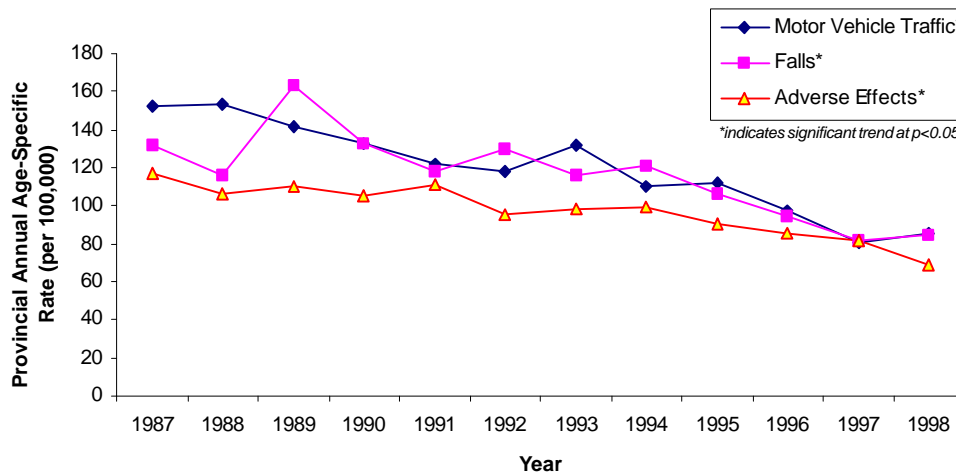
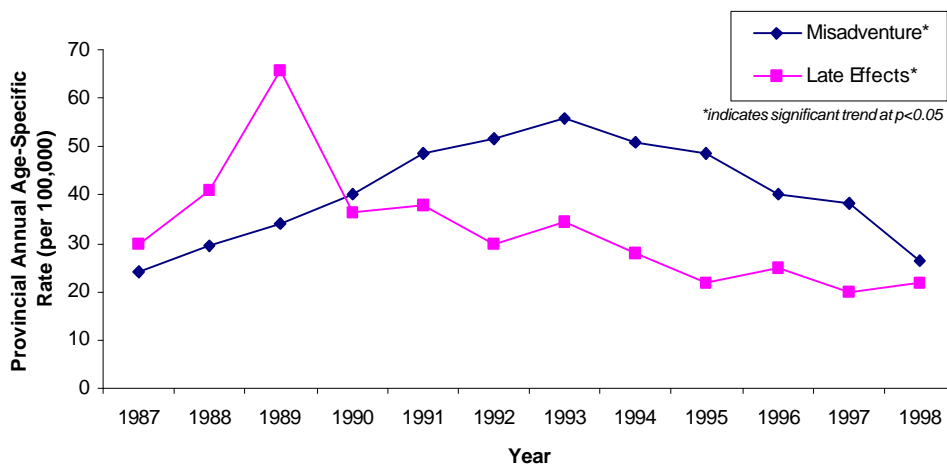


Figure 3.3b: Trends for Annual Age-Specific Hospital Separation Rates, 1987-1998, BC, Females, Ages 25-34



Age Group 35-44**Males**

Rates due to Falls, among males in the 35-44 years age group, showed significant downward trend (decreased from 270 to 189 per 100,000 during the 12-year period). Hospital separation rates due to Motor Vehicle Traffic injuries also showed significant downward trend, decreasing from 206 to 140 per 100,000 over the 12-year period. Struck by an Object, Late Effects and Adverse Effects were among the first five leading causes of hospitalization, each showing a significant downward trend (Figure 3.4 a,b).

[Appendix B-3d]

Figure 3.4a: Trends for Annual Age-Specific Hospital Separation Rates, 1987-1998, BC, Males, Ages 35-44

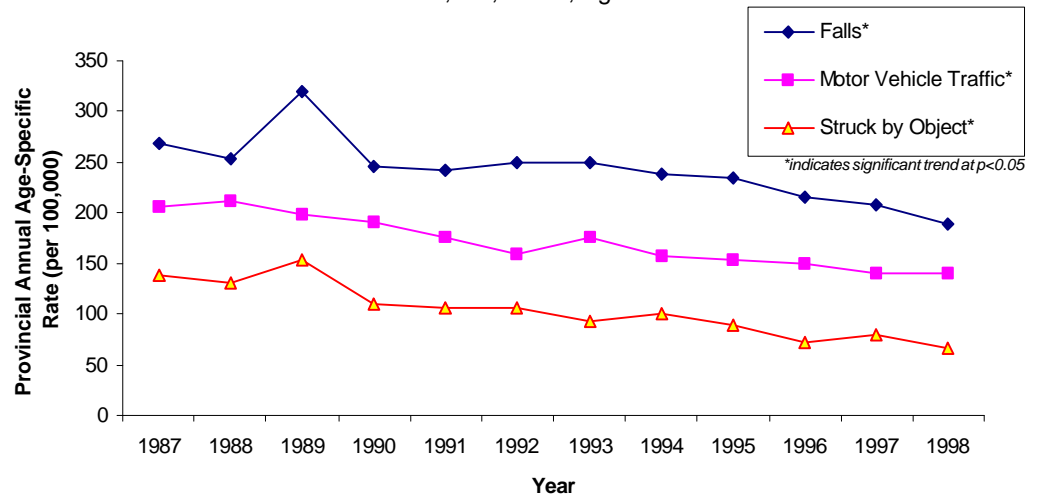
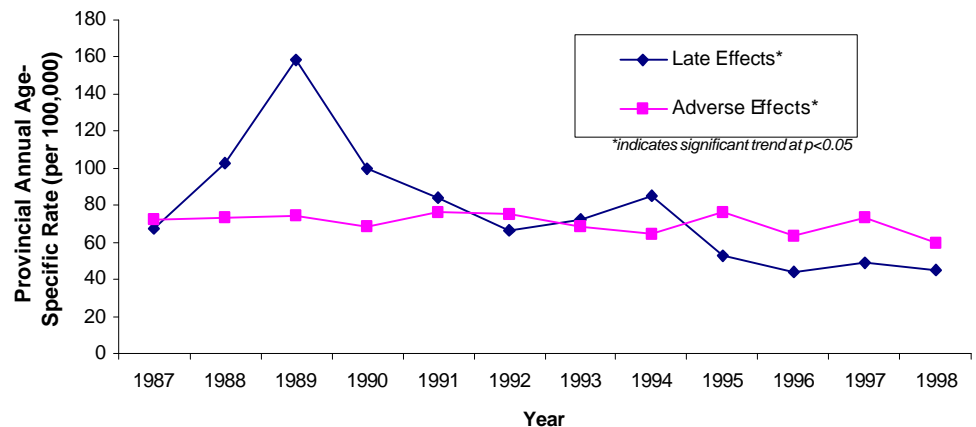
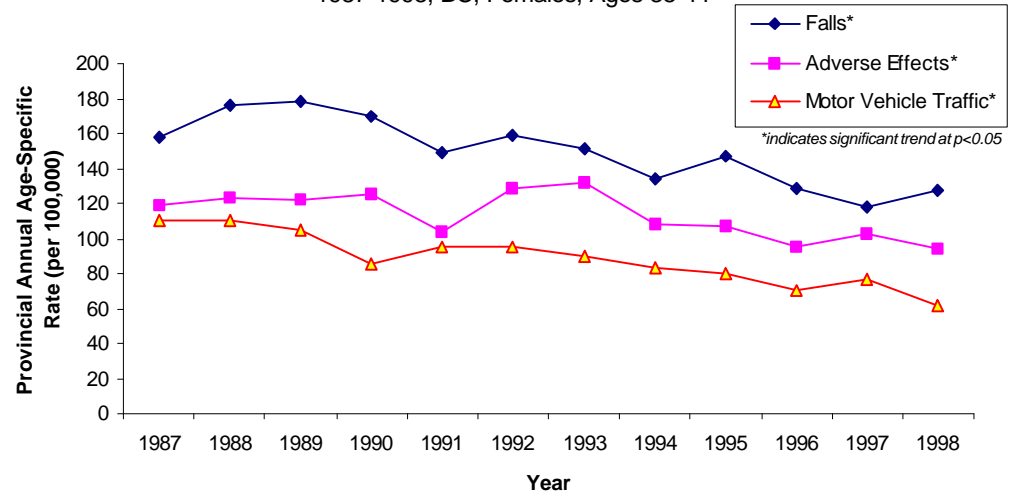


Figure 3.4b: Trends for Annual Age-Specific Hospital Separation Rates, 1987-1998, BC, Males, Ages 35-44

**Females**

Statistically significant downward trends for hospital separation rates due to all first four leading causes were found among females aged 35-44 years ($p < .05$) (Figure 3.5a,b). Hospital separation rates due to Falls and Adverse Effects decreased from 157 to 127 per 100,000 and from 119 to 93 per 100,000, respectively. Hospital separations due to

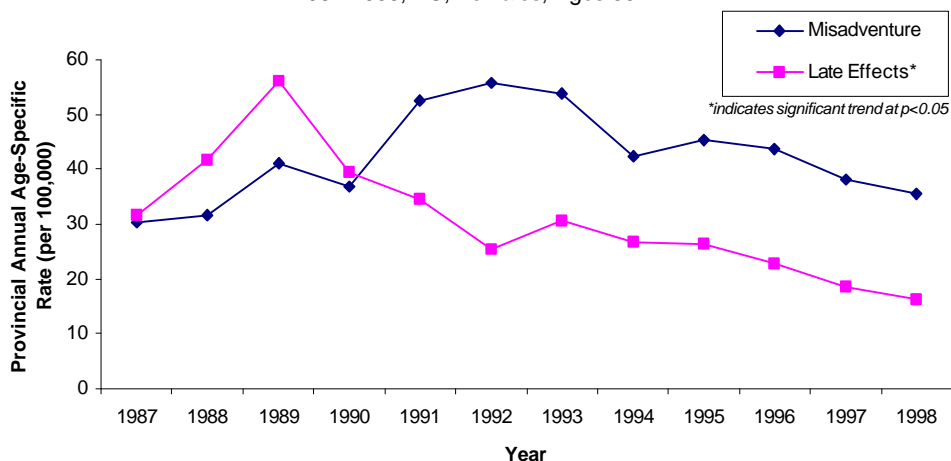
Figure 3.5a: Trends for Annual Age-Specific Hospital Separation Rates, 1987-1998, BC, Females, Ages 35-44



MV Traffic and Late Effect significantly decreased whereas hospitalizations due to Misadventure remained steady through the 12 year period.

[Appendix B-3e]

Figure 3.5b: Trends for Annual Age-Specific Hospital Separation Rates, 1987-1998, BC, Females, Ages 35-44



Age Group 45-64

Males and Females

Hospital separation rates due to the first three leading causes, Falls, Adverse Effects and Motor Vehicle Traffic, were similar among males and females in the 45-64 years age group. (Figure 3.6a, 3.7a). There was a significant downward trend for all three leading causes of injuries. During the 12-year period, Falls dropped from 363 to 269 per 100,000 among males and from 388 to 278 per 100,000 among females. A similar pattern was seen for Adverse Effects. A significant decrease in hospitalization due to MV Traffic, Other Transport and Struck by an Object was observed among males (Figure 3.6b). Among females, a decreasing trend was seen in

Figure 3.6a: Trends for Annual Age-Specific Hospital Separation Rates, 1987-1998, BC, Males, Ages 45-64

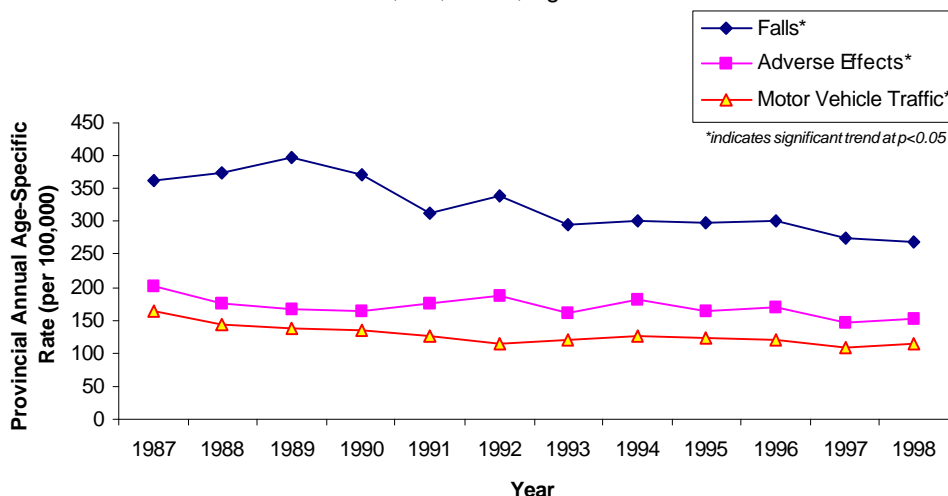
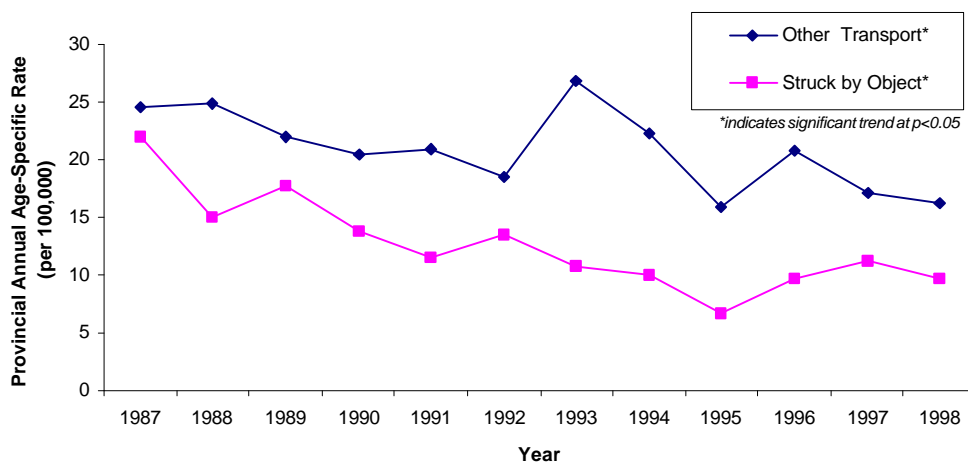


Figure 3.6b: Trends for Annual Age-Specific Hospital Separation Rates, 1987-1998, BC, Males, Ages 45-64



separation rates due to MV Traffic and Adverse Effects, as well as an overall significantly increasing trend in hospitalizations due to Misadventure (Figure 3.7b). [Appendix B-3f,g]

Figure 3.7a: Trends for Annual Age-Specific Hospital Separation Rates, 1987-1998, BC, Females, Ages 45-64

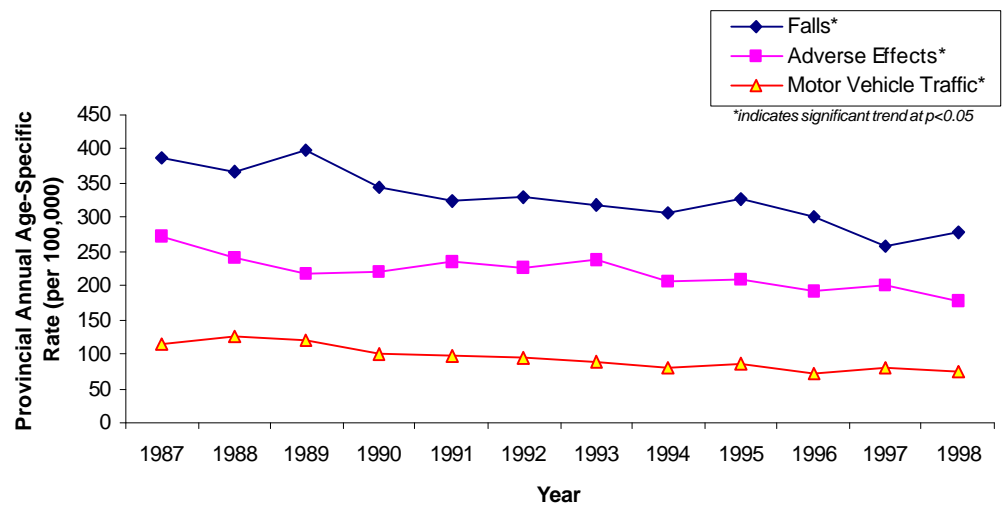
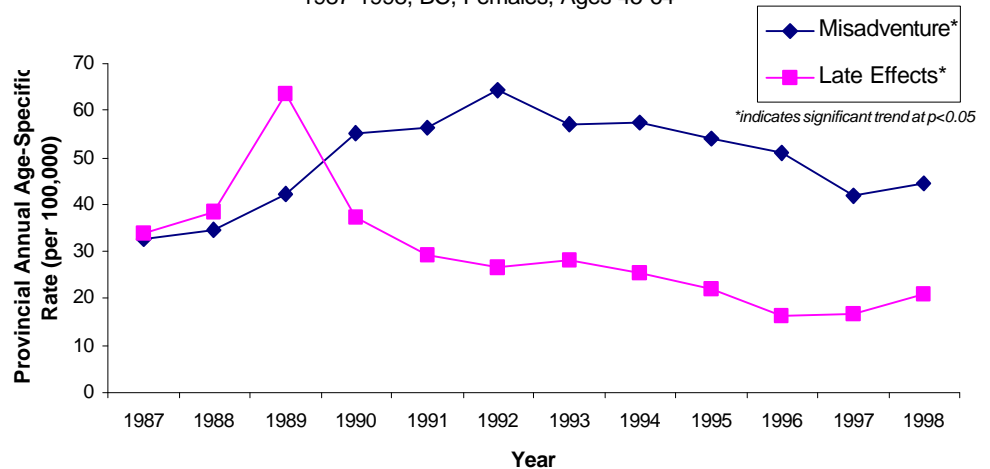


Figure 3.7b: Trends for Annual Age-Specific Hospital Separation Rates, 1987-1998, BC, Females, Ages 45-64

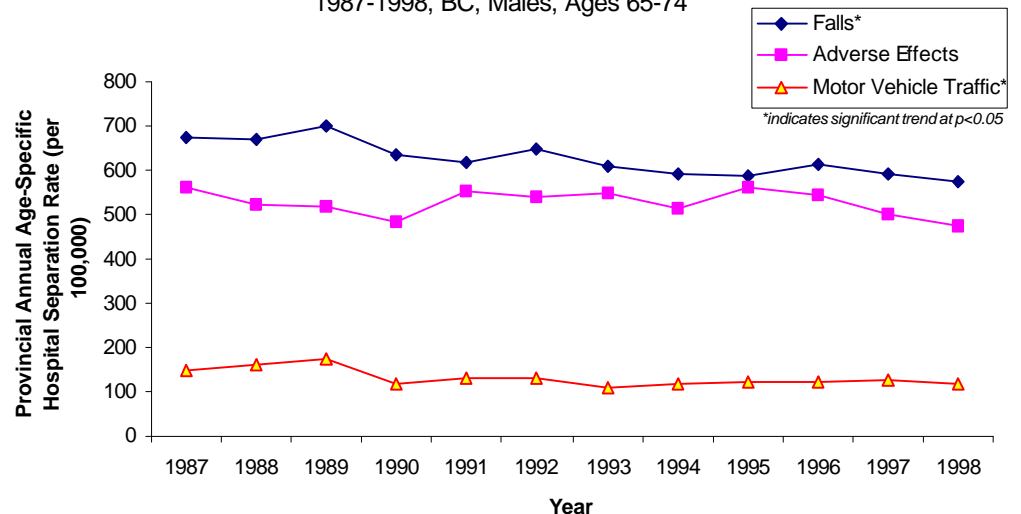


Age Group 65-74

Males

Hospital separation rates due to the first three leading causes among males aged 65-74 years (Figure 3.8a) were about two times higher than rates among younger males (45-64 years old). Significant downward trends were seen in hospital separation rates due to Falls as they de-

Figure 3.8a: Trends for Annual Age-Specific Hospital Separation Rates, 1987-1998, BC, Males, Ages 65-74



creased from 673 to 575 per 100,000. Adverse Effects remained steady during the 12-year period with rates around 500 per 100,000. MV Traffic and, on a much lower scale, Late Effects, showed a significant decrease in hospitalizations. (Figure 3.8b). Misadventure showed a steady increase especially from 1987 to 1992, after which the rates leveled off or decreased slightly from 1993 to 1998. [Appendix B-3h]

Females

A downward trend was noticed in injuries due to Falls (from 1026 to 822 per 100,000) and MV Traffic (from 140 to 96 per 100,000) (Figure 3.9a). Adverse Effects remained steady over the years as well as Poisoning (on a lower scale) (Figure 3.9a,b). Misadventures showed an increase in hospitalizations from 1987 to 1993, after which the rates decreased slightly during the period from 1994 to 1998 (The overall upward trend was significant). [Appendix B-3i]

Figure 3.8b: Trends for Annual Age-Specific Hospital Separation Rates, 1987-1998, BC, Males, Ages 65-74

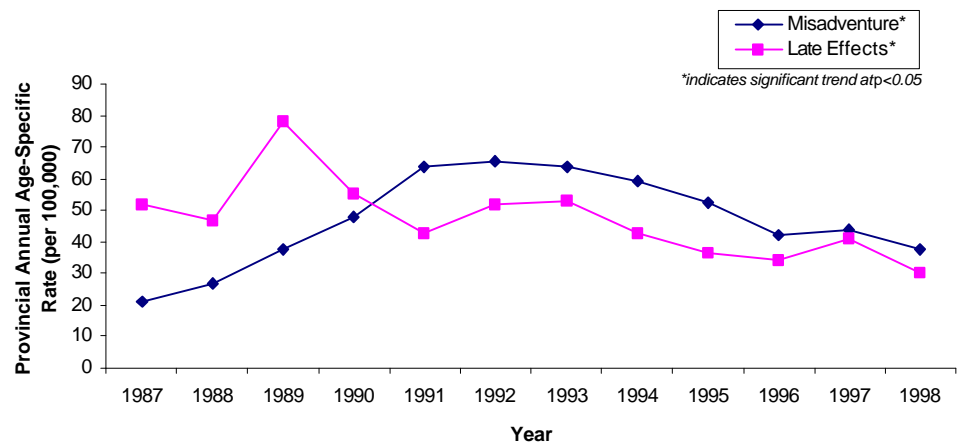


Figure 3.9a: Trends for Annual Age-Specific Hospital Separation Rates, 1987-1998, BC, Females, Ages 65-74

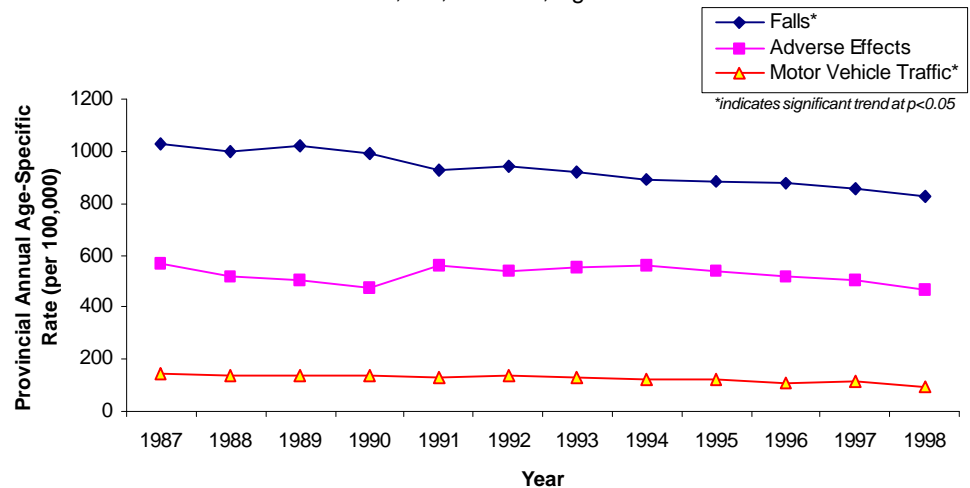
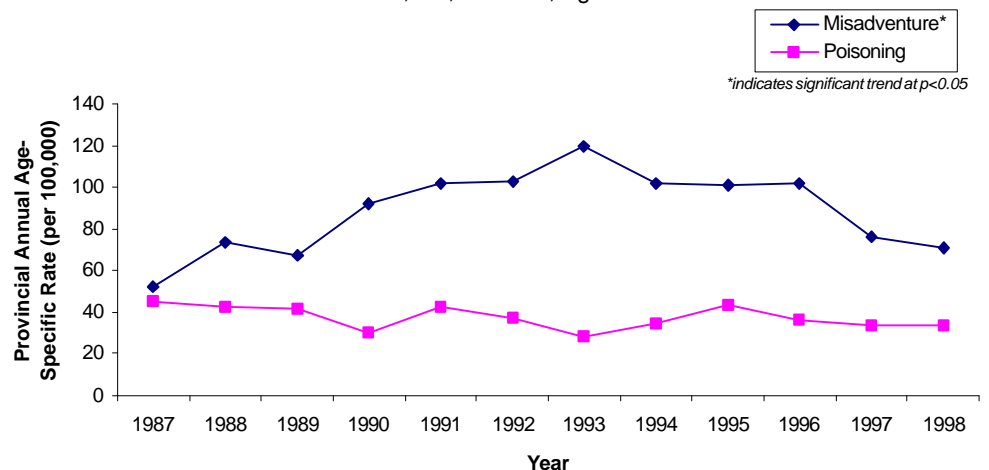


Figure 3.9b: Trends for Annual Age-Specific Hospital Separation Rates, 1987-1998, BC, Females, Ages 65-74



Age Group 75-79**Males**

Hospital separation rates due to Falls, Adverse Effects and MV Traffic among males in the 75-79 years age group are presented in *Figure 3.10a*. Fall injuries decreased significantly from 1372 to 1049 per 100,000 during 12-year period. Adverse Effects separations remained steady. Hospitalizations due to MV Traffic, Misadventure and Poisoning were on a much lower scale (*Figures 3.10a-b*). MV Traffic hospitalizations significantly decreased, while Poisoning remained stable. Misadventure showed an overall significantly increasing trend. [Appendix B-3j]

Females

The highest hospital separation rates among females aged 75-79 years were due to Falls despite the significant downward trend (rates dropped from 2079 to 1807 per 100,000) (*Figure 3.11a*). Hospital Separation rates due to Adverse Effects remained steady over the years. On a much lower scale, Motor Vehicle Traffic injuries decreased significantly (*Figure 3.11b*). Hospitalizations due to Misadventure showed an

Figure 3.10a: Trends for Annual Age-Specific Hospital Separation Rates, 1987-1998, BC, Males, Ages 75-79

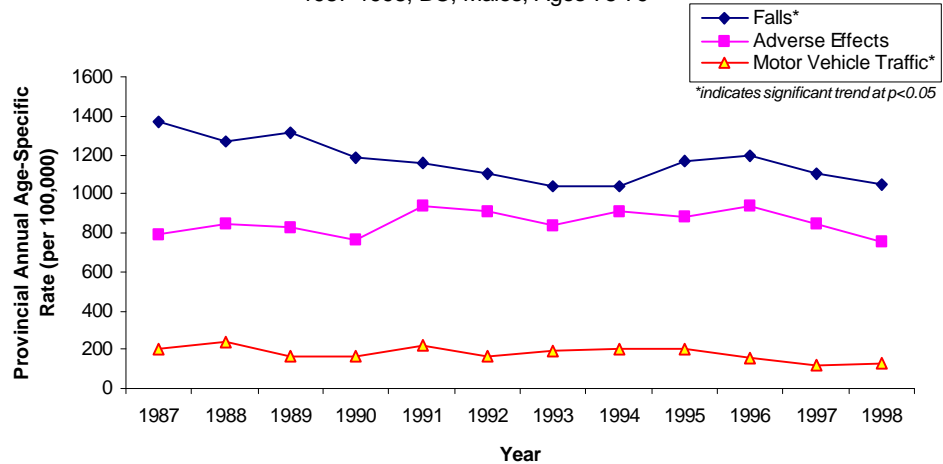


Figure 3.10b: Trends for Annual Age-Specific Hospital Separation Rates, 1987-1998, BC, Males, Ages 75-79

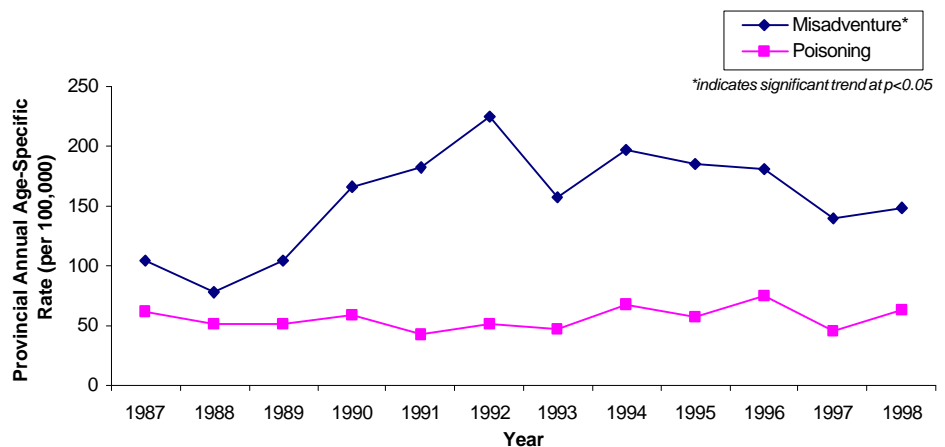
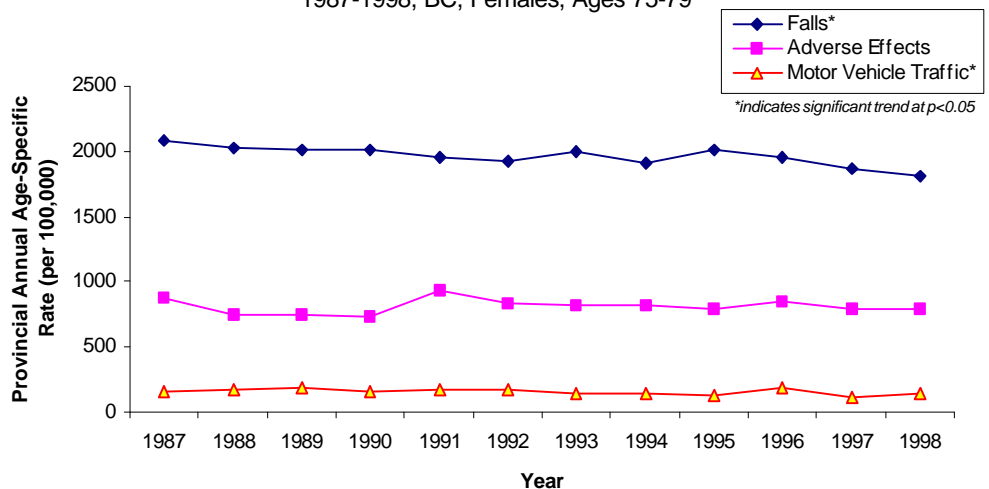
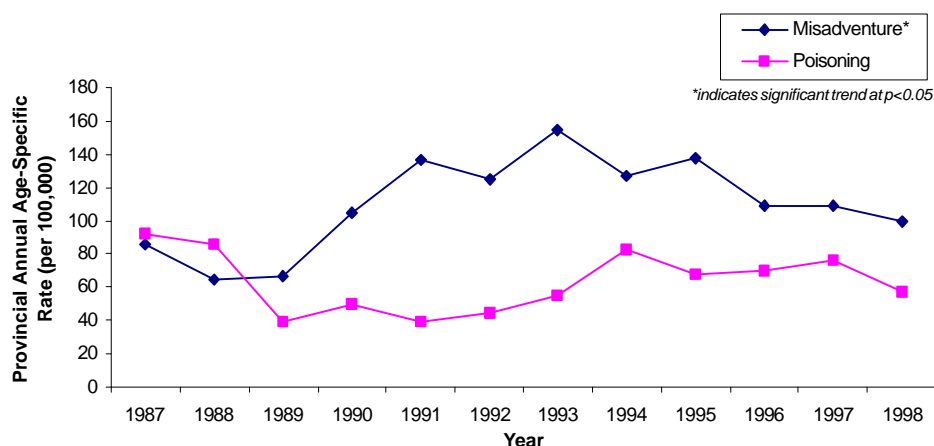


Figure 3.11a: Trends for Annual Age-Specific Hospital Separation Rates, 1987-1998, BC, Females, Ages 75-79



overall significant increase, most apparent between 1988 and 1993. From 1994 to 1998, Misadventure decreased while poisoning remained steady. [Appendix B-3k]

Figure 3.11b: Trends for Annual Age-Specific Hospital Separation Rates, 1987-1998, BC, Females, Ages 75-79



Age Group 80+

Males

Among males in the over 80 years age group, hospital separation rates due to Falls were the highest (Figure 3.12a). Injuries due to Adverse Effects remained steady with values approximately 2.5 times lower than Falls. MV Traffic, Misadventure and Poisoning had much lower rates (Figure 3.12a,b), and none of them showed a significant trend. Injury rates due to Misadventure increased four times between 1988 to 1992, then dropped and remained stable from 1993 to 1998.

[Appendix B-3l]

Figure 3.12a: Trends for Annual Age-Specific Hospital Separation Rates, 1987-1998, BC, Males, Ages 80+

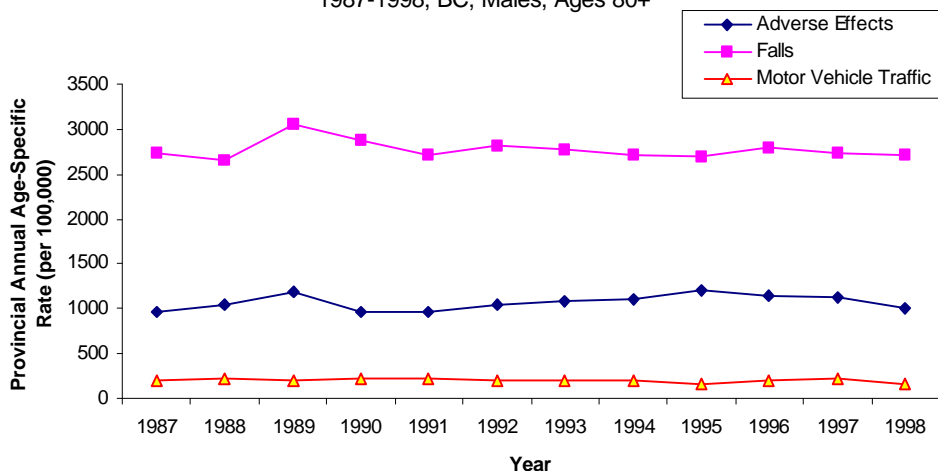
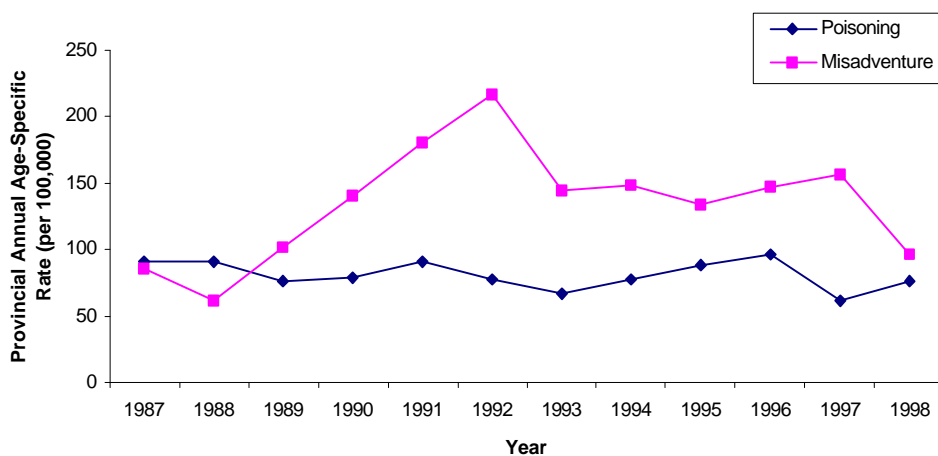


Figure 3.12b: Trends for Annual Age-Specific Hospital Separation Rates, 1987-1998, BC, Males, Ages 80+



Females

Hospital separation rates due to Falls among females aged 80 years and older were the highest in comparison with any other male or female age group. In comparison with the second leading cause of injuries for females over the 80 years age group, Falls had two to three times higher rates even though a significant decreasing trend was observed (rates dropped from 4799 per 100,000 in 1987 to 4492 per 100,000 in 1998). (Figure 3.13a,b). Adverse Effects rates remained steady. Hospital separation rates were much lower for MV Traffic, Misadventure and Poisoning (Figures 3.13a,b). Similarly to males, none of these causes showed significant trends, however, there was a noticeable increase in separations due to Misadventure between 1988 and 1991.

[Appendix B-3m]

Figure 3.13a: Trends for Annual Age-Specific Hospital Separation Rates, 1987-1998, BC, Females, Ages 80+

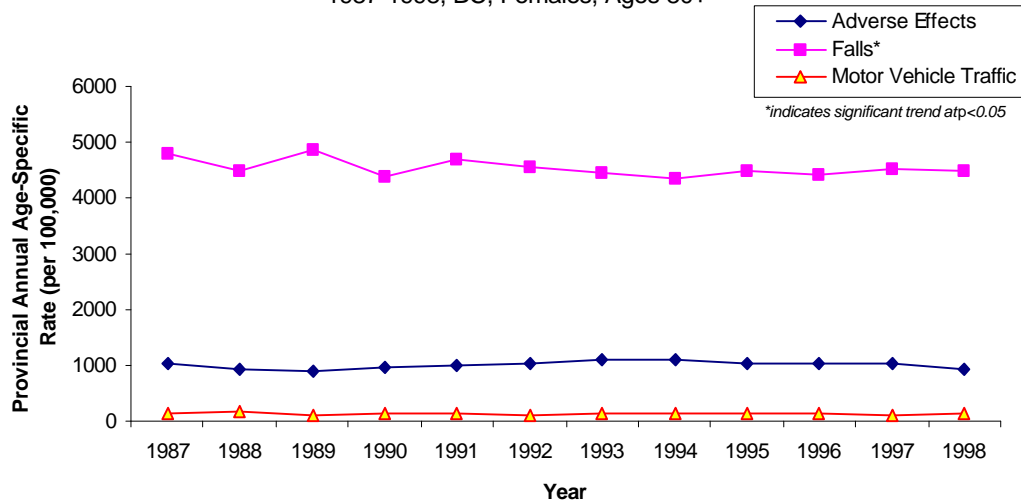
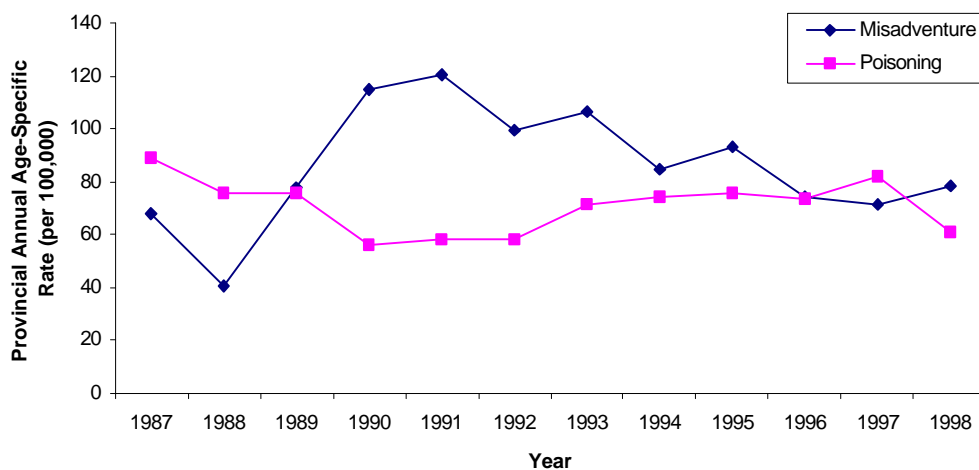


Figure 3.13b: Trends for Annual Age-Specific Hospital Separation Rates, 1987-1998, BC, Females, Ages 80+



Patterns of Regional Variations

REGIONAL VARIATIONS IN INJURY HOSPITAL SEPARATION BY AGE AND GENDER

Males [Aged 25-34]

The regional variation of the hospital separation rates among males aged 25-34 is depicted in *Figure 3.14*. Compared to the province, Cariboo and Coast Garibaldi Health Regions had the highest separation rates, 2.4 and 2.3 times higher than the BC average rate ($p < 0.05$). West Kootenay - Boundary, North West, Upper Island / Central Coast and Thompson Health Regions had two times higher hospital separation rates than the provincial average ($p < 0.05$). Burnaby, Richmond and Vancouver showed significantly lower rates than the provincial average. In Vancouver, hospital separation rates due to injuries were less than half in comparison with the provincial average. [Appendix B-4a]

Females [Aged 25-34]

The North West Health Region had the highest separation rate, two times higher than the BC average for females aged 25-34 years ($p < 0.05$). Other regions with high separation rates were: Coast Garibaldi, Cariboo, West Kootenay and Thompson Health Regions (rates 80-90% above the BC average, $p < 0.05$). Health Regions with separation rates exceeding provincial average by 50-65% were: Peace Liard, Upper Island / Central Coast, Northern Interior and North Okanagan. Richmond had a significantly lower rate than the BC average rate, while Vancouver had the lowest separation rates, about 60% below the provincial average. [Figure 3.15, Appendix B-5a]

Figure 3.14: Annual Average Age-Specific Hospital Separation Rate Ratio, 1987-1998, BC, by Health Region, Males, Ages 25-34

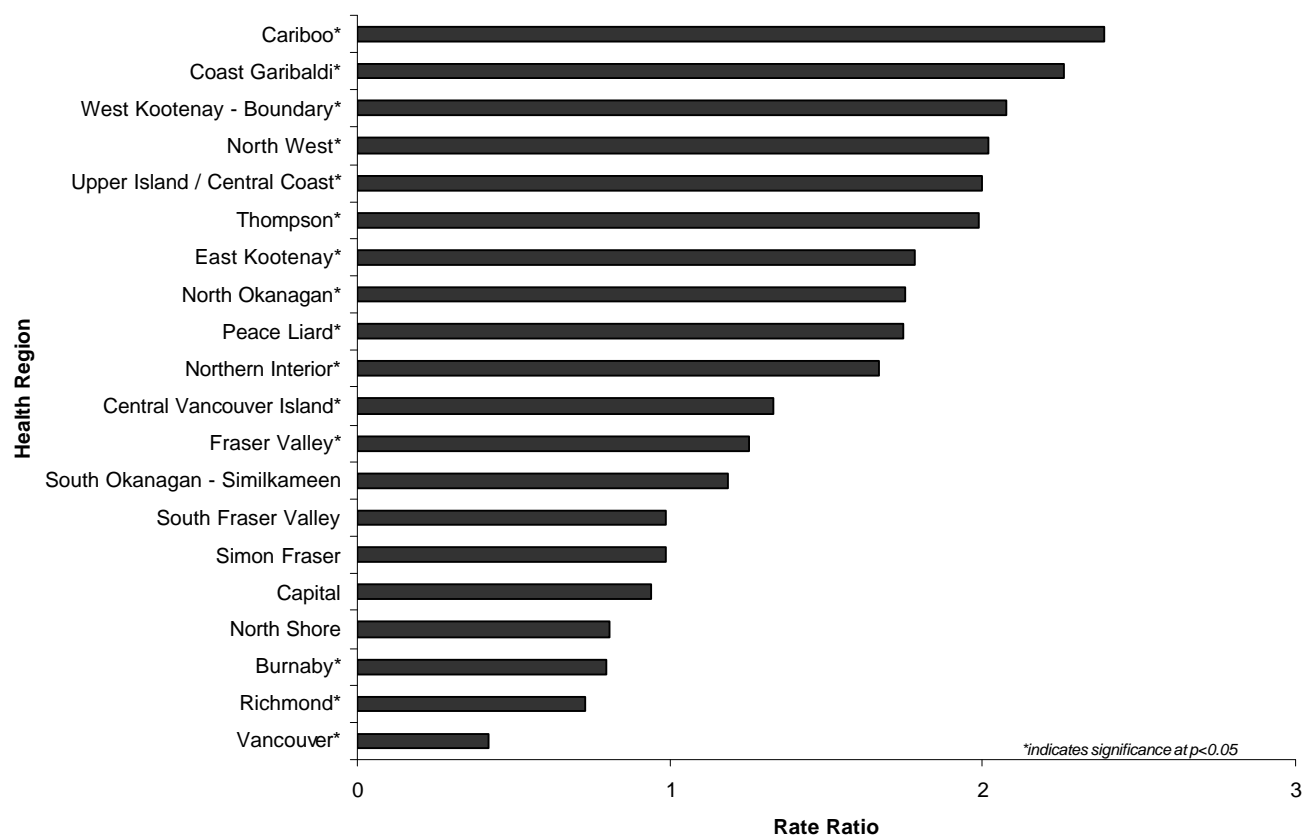
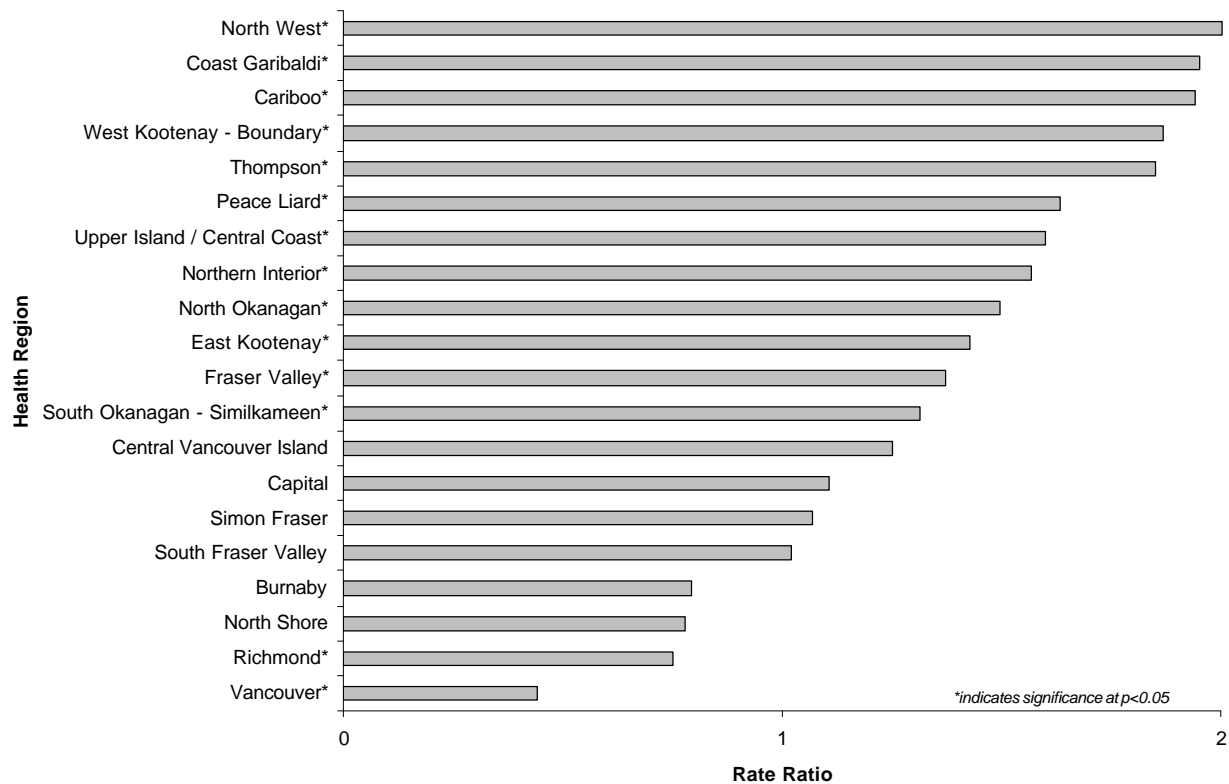
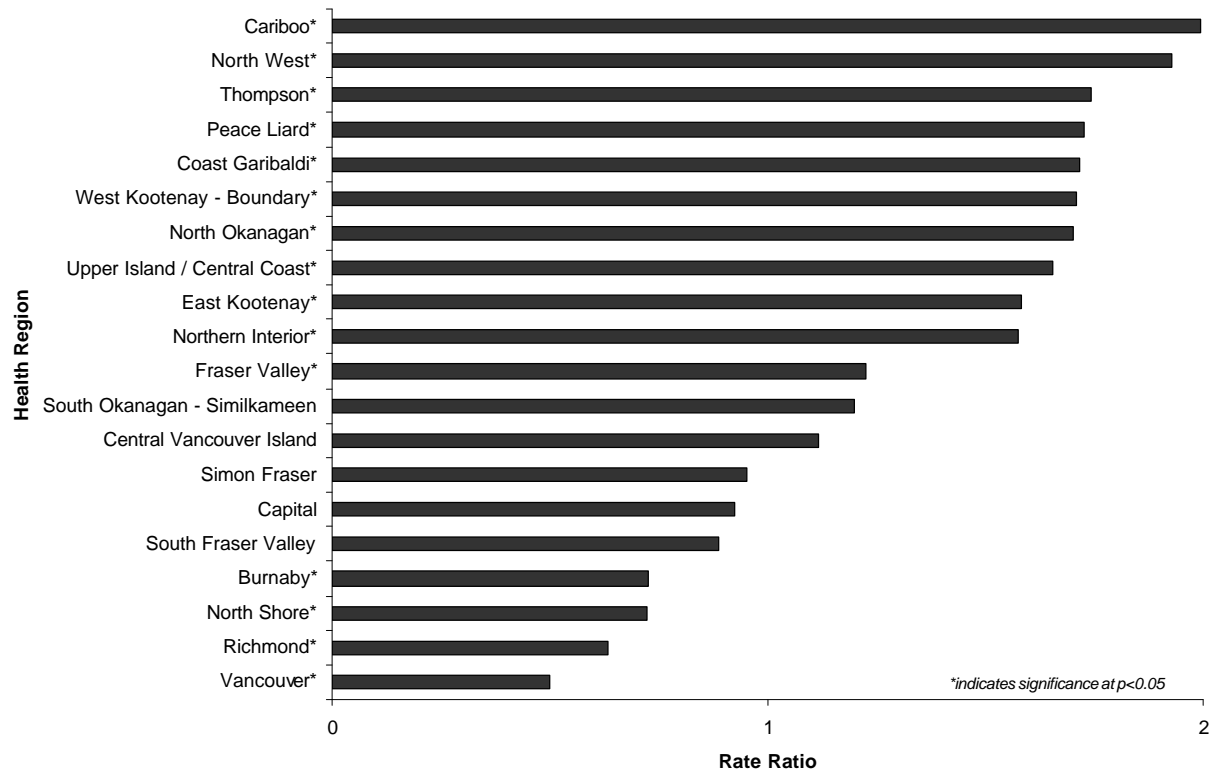


Figure 3.15: Annual Average Age-Specific Hospital Separation Rate Ratio, 1987-1998, BC, by Health Region, Females, Ages 25-34**Figure 3.16:** Annual Average Age-Specific Hospital Separation Rate Ratio, 1987-1998, BC, by Health Region, Males, Ages 35-44

Males [Aged 35-44]

The highest hospital separation rate among 35 to 44-year-old males was in the Cariboo and North West Health Regions (99 and 93% above the BC average for 35-44 year old males, $p<0.05$) (Figure 3.16). High rates were also found in Thompson, Peace Liard, Coast Garibaldi, West Kootenay and North Okanagan Health Regions (70-75% above the provincial average, $p<0.05$). Vancouver, Richmond, North Shore and Burnaby had significantly lower rates in comparison with the provincial average (The rates in Vancouver were 50% below the average). [Appendix B-4a]

Females [Aged 35-44]

The highest hospital separation rate for females in the 35-44 years age group was also in the North West and Cariboo Health Regions (86 and 85% above the BC average; $p<0.05$). Next were Coast Garibaldi, Peace

Liard, Thompson, West Kootenay, Northern Interior and Fraser Valley Health Regions (with separation rates from 40 to 76% above the provincial average; $p<0.05$) (Figure 3.17). The lowest rates were in Vancouver and North Shore (54 and 22% below the BC average; $p<0.05$). [Appendix B-5a]

Males [Aged 45-64]

The highest hospital separation rates by health region among males aged 45-64 years were in North West and Cariboo (85 and 72% above the BC average rate; $p<0.05$) (Figure 3.18). Rates 50-60% higher than average were found in Peace Liard, Thompson, Coast Garibaldi and West Kootenay. As with the younger males, Vancouver, North Shore and Richmond had the lowest separation rates (51, 25 and 19% below BC average). [Appendix B-4a]

Figure 3.17: Annual Average Age-Specific Hospital Separation Rate Ratio, 1987-1998, BC, by Health Region, Females, Ages 35-44

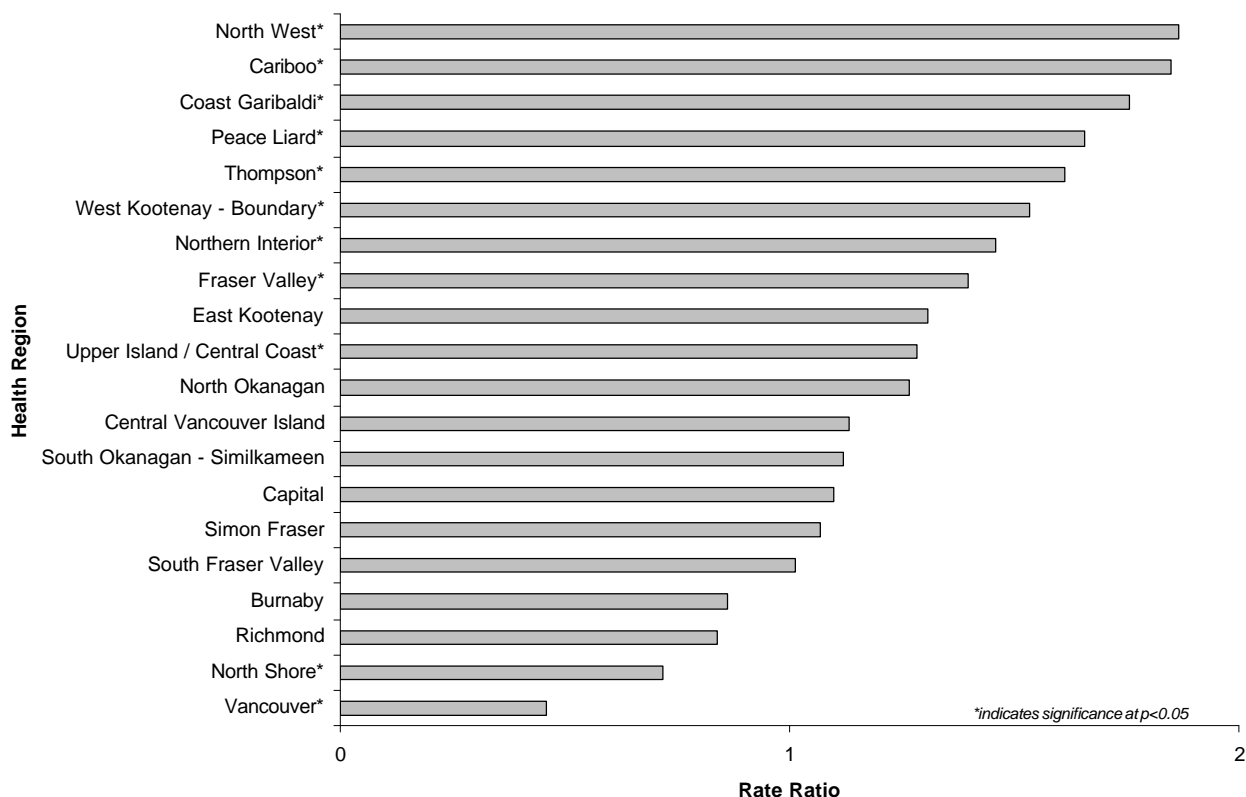


Figure 3.18: Annual Average Age-Specific Hospital Separation Rates, 1987-1998, BC, by Health Region, Males, Ages 45-64

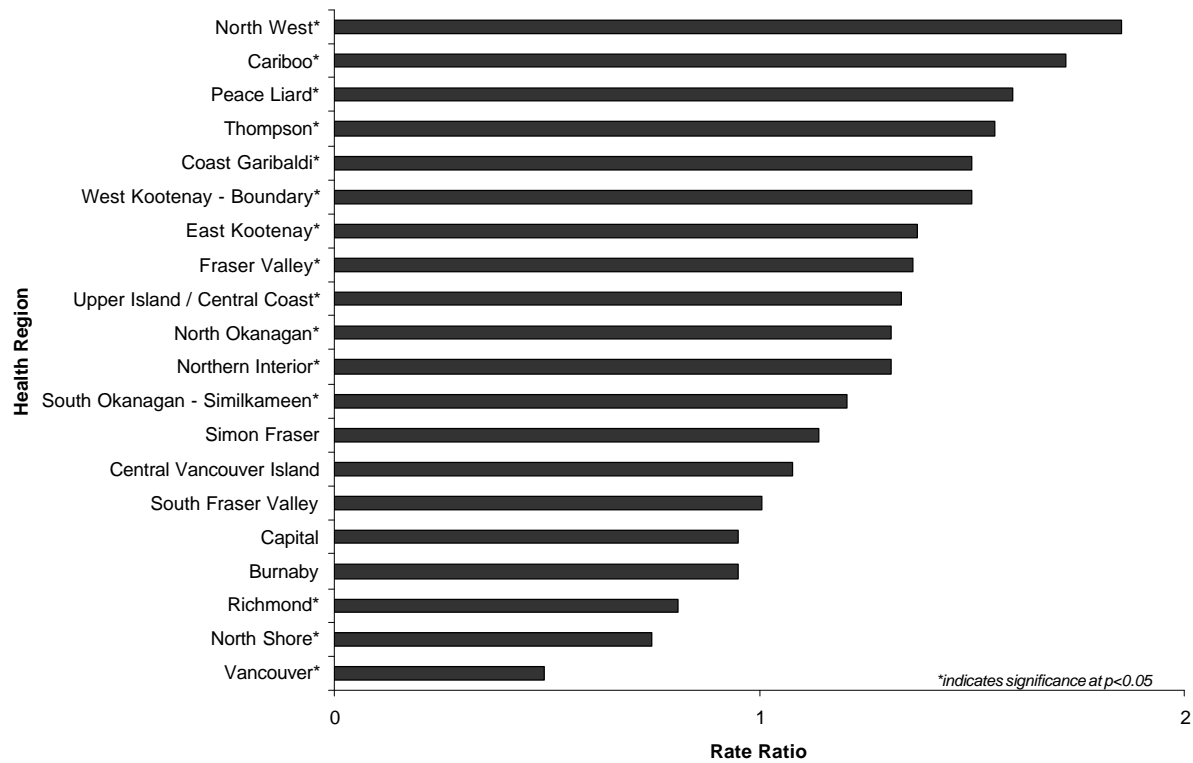
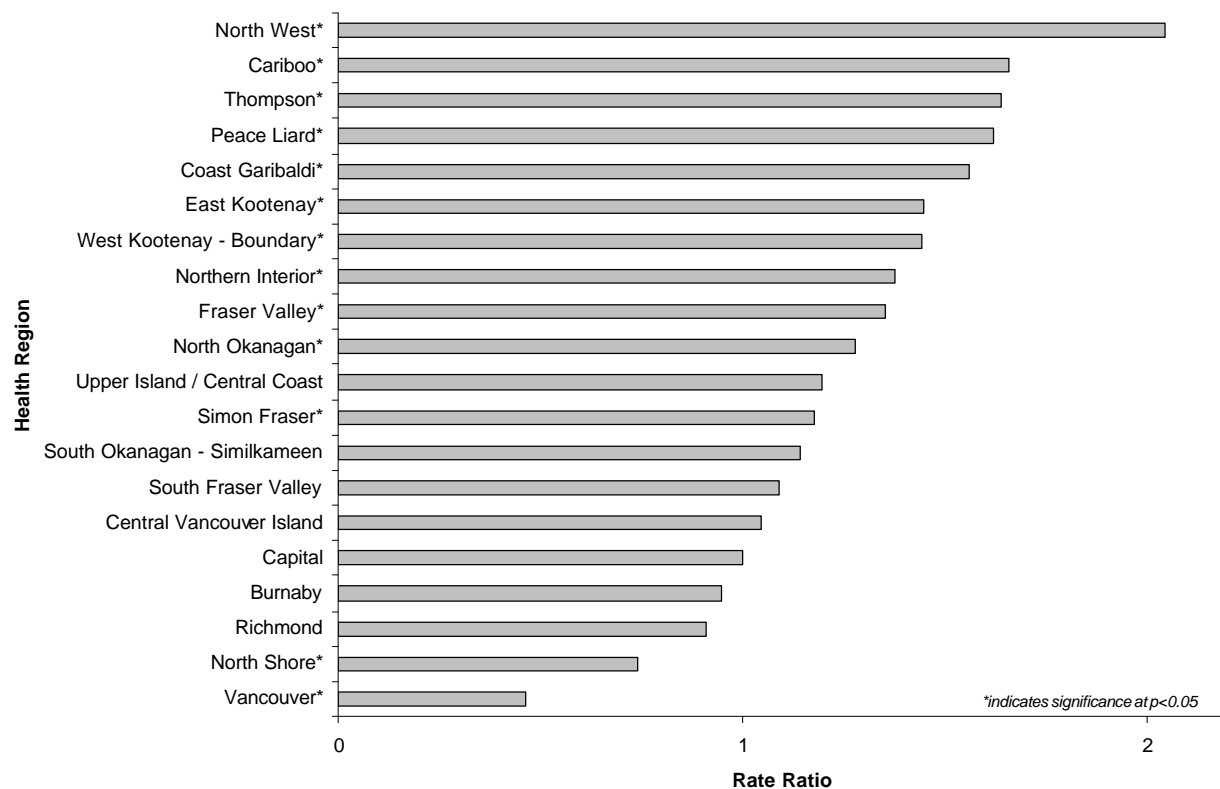


Figure 3.19: Annual Average Age-Specific Hospital Separation Rate Ratio, 1987-1998, BC, by Health Region, Females, Ages 45-64



Females [Aged 45-64]

Adult females aged 45-64 years old in the North West had the highest separation rate (100% above the BC average). (Figure 3.19). The next highest rates were in Cariboo, Thompson and Peace Liard (66-62% above the average), followed by Coast Garibaldi (56% above the average). North Shore and Vancouver had the lowest separation rates (54 and 26% below the BC average). [Appendix B-5a]

Males [Aged 65-74]

North West Health Region had the highest separation rate, 63% higher than the BC average among males aged 65-74 years ($p<0.05$) (Figure 3.20). Next were Cariboo, Simon Fraser, Coast Garibaldi and Thompson Health Regions (with separation rates 37-41% higher than the provincial average; $p<0.05$). Vancouver showed significantly lower rates. In Vancouver, hospital separation rates due to injuries were 51% less than the provincial average. [Appendix B-4b]

Females [Aged 65-74]

The North West Health Region had the highest separation rate, 89% higher than the BC average. Females in Cariboo, Thompson and Coast Garibaldi Health Regions experienced hospitalization rates 53-57% higher than the BC average ($p<0.05$). The only region with separation rate significantly less than the provincial average was Vancouver (rate lower than average by 52%). [Figure 3.21, Appendix B-5b]

Males [Aged 75-79]

The highest hospital separation rate among males in the 75-79 years age group was in the North West Health Region (82% above the BC average rate; $p<0.05$) (Figure 3.22). High rates were also found in Simon Fraser and Thompson Health regions (50 and 44% above the provincial average). Vancouver had the lowest rate (51% below the average). [Appendix B-4b]

Figure 3.20: Annual Average Age-Specific Hospital Separation Rate Ratio, 1987-1998, BC, by Health Region, Males, Ages 65-74

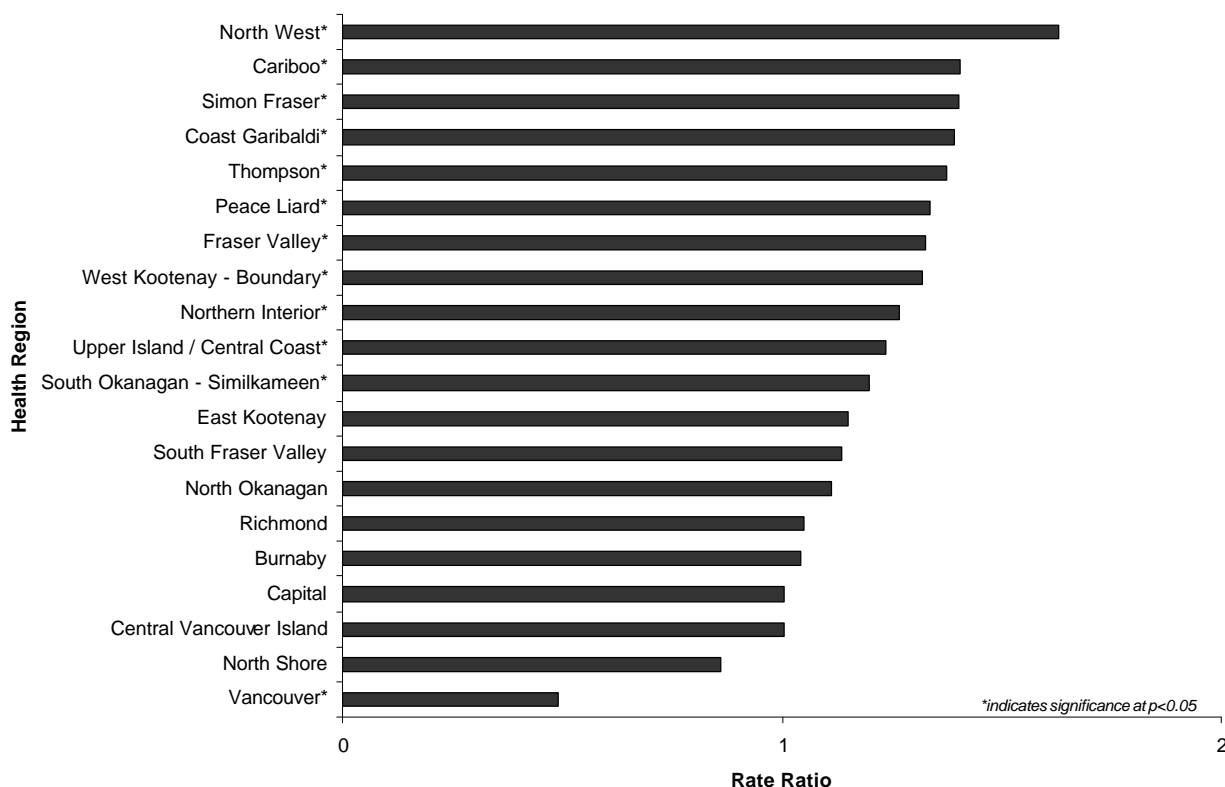
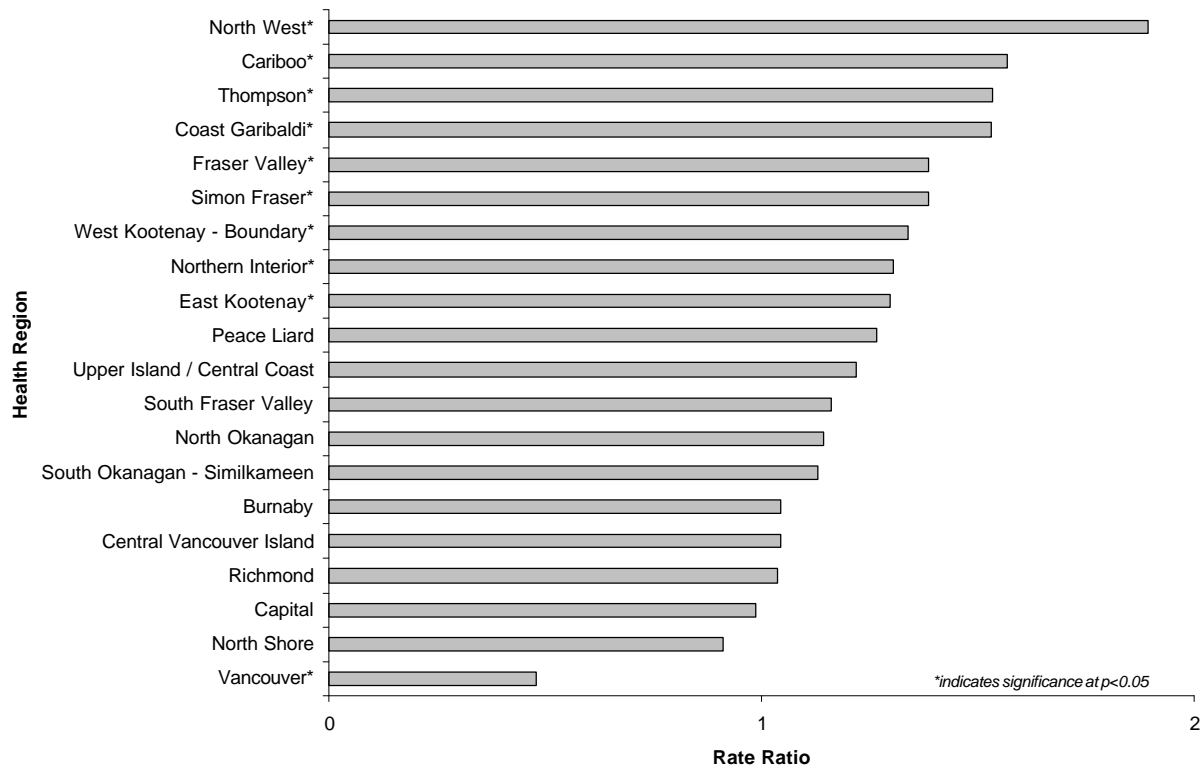
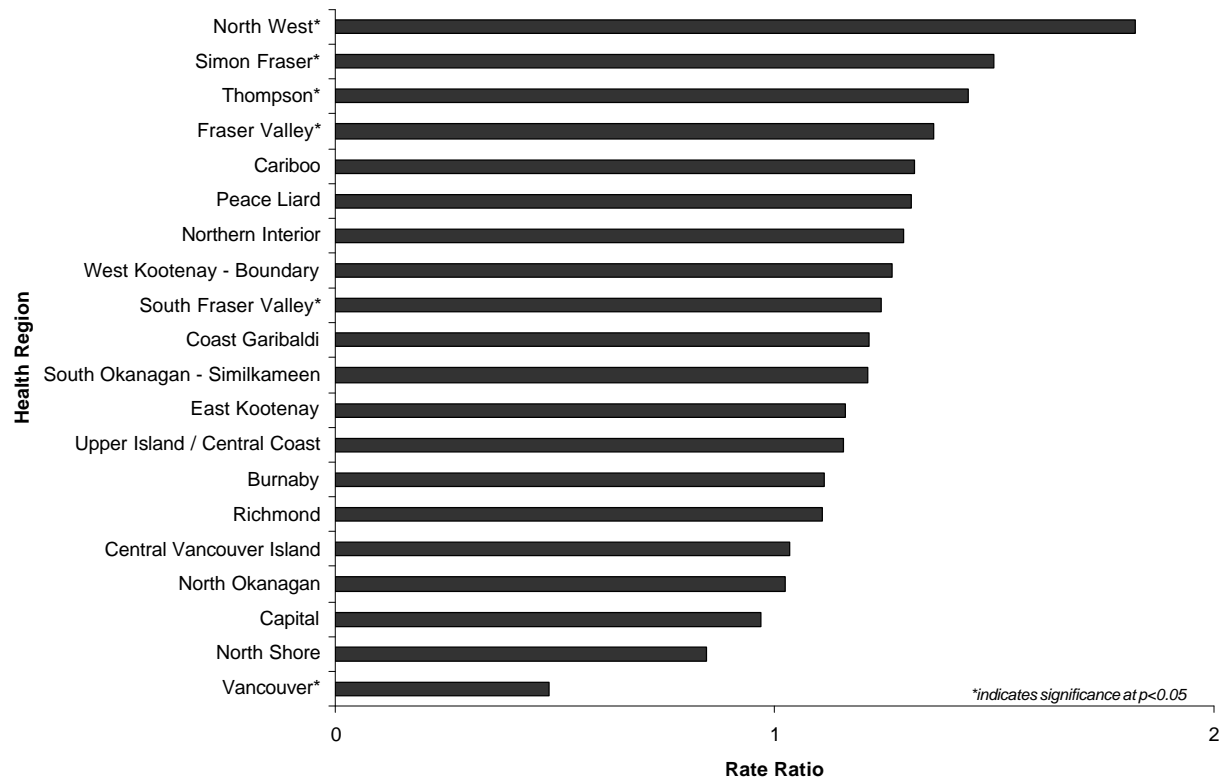


Figure 3.21: Annual Average Age-Specific Hospital Separation Rate Ratio, 1987-1998, BC, by Health Region, Females, Ages 65-74**Figure 3.22:** Annual Average Age-Specific Hospital Separation Rate Ratio, 1987-1998, BC, by Health Region, Males, Ages 75-79

Females [Aged 75-79]

Similarly to males, the highest hospital separation rate for females aged 75-79 years was in the North West Health Region (two times higher than the BC average; $p<0.05$). North West was followed by Cariboo and Coast Garibaldi with separation rates 76 and 75% above the provincial average; $p<0.05$. (Figure 3.23). The lowest rate was in Vancouver (51% below the average; $p<0.05$). [Appendix B-5b]

Males & Females [Aged 80+]

Males and females aged 80 years and older in North West and Coast Garibaldi Health Regions had higher hospitalization rates due to injuries than the provincial average (68 and 64% higher for males and 106 and 94% higher rates for females) (Figure 3.24, 3.25). Among males, high separation rates were found also in Thompson and Northern Interior Health Regions (52 and 48% above the BC average rate). Among females, high separation rates were in Cariboo and West Kootenay Health Regions (62 and 55% above the BC average rate). Vancouver separation rates were significantly lower than the BC average by 52% for males and by 48% for females. [Appendix B-4b,B-5b]

Figure 3.23: Annual Average Age-Specific Hospital Separation Rate Ratio, 1987-1998, BC, by Health Region, Females, Ages 75-79

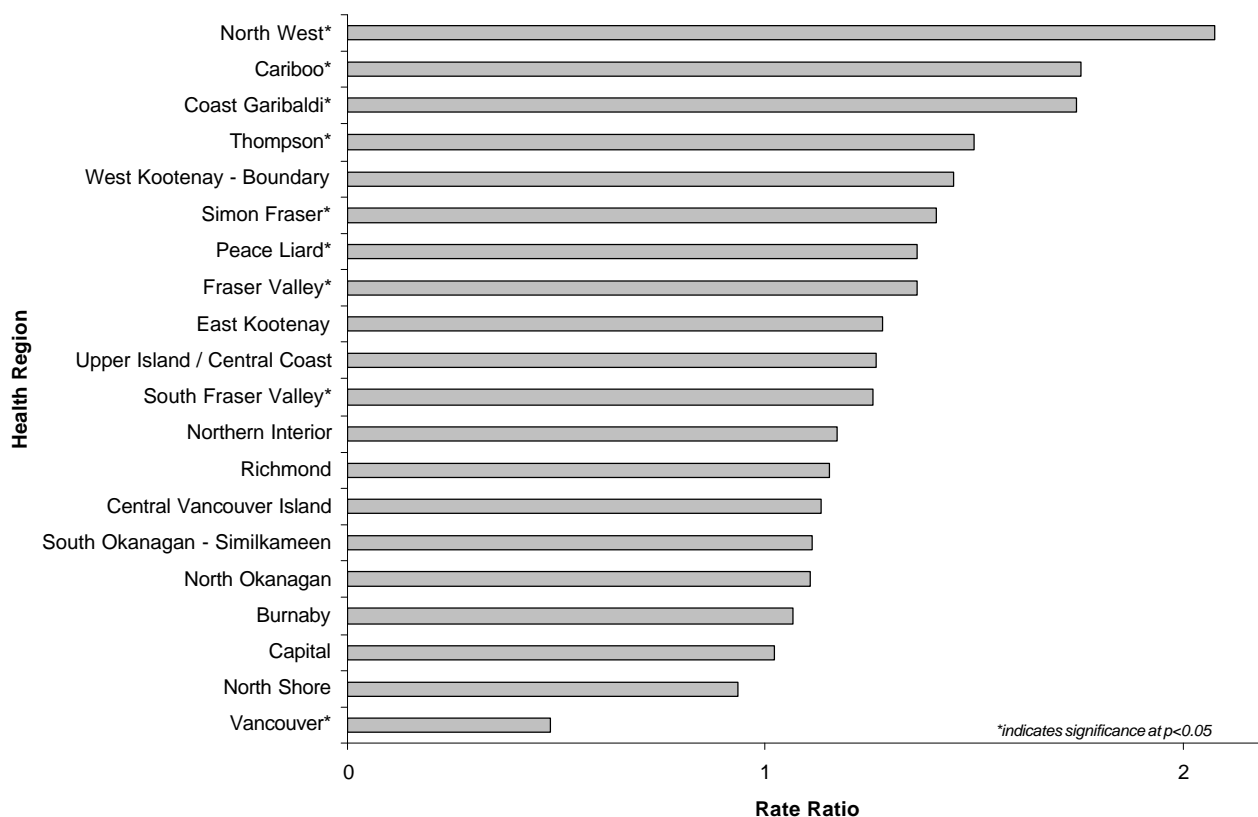
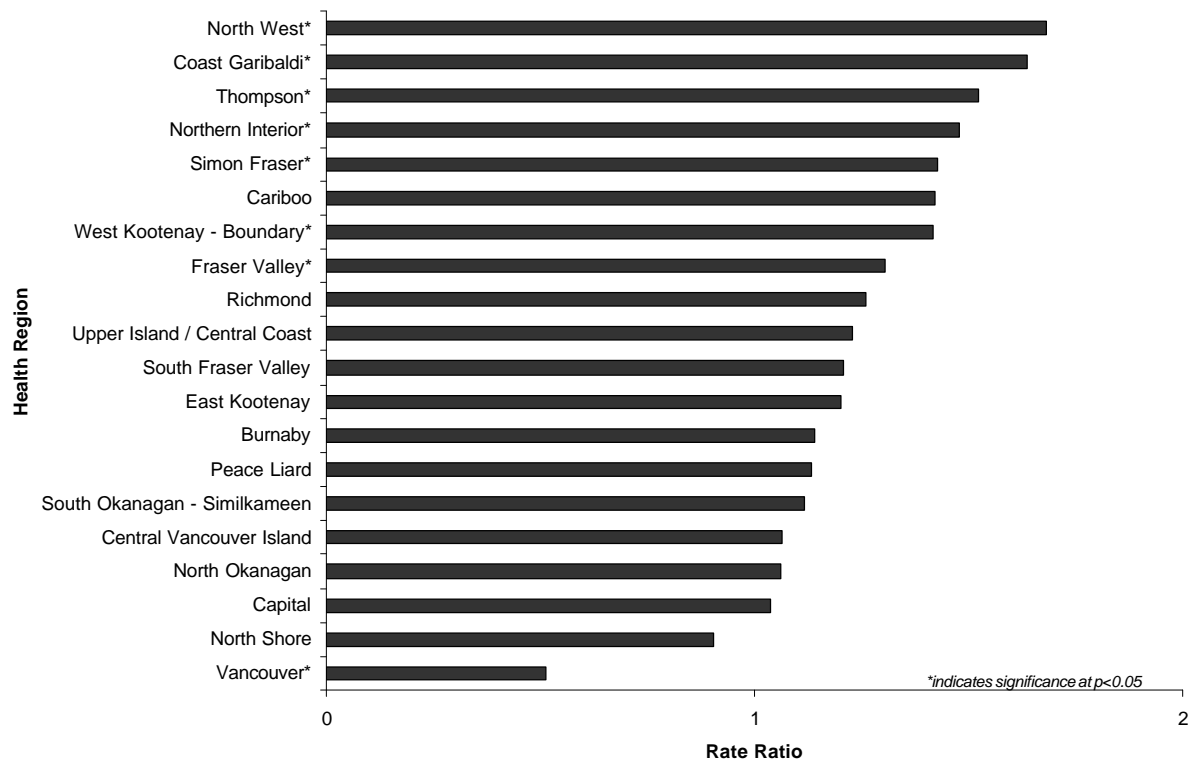
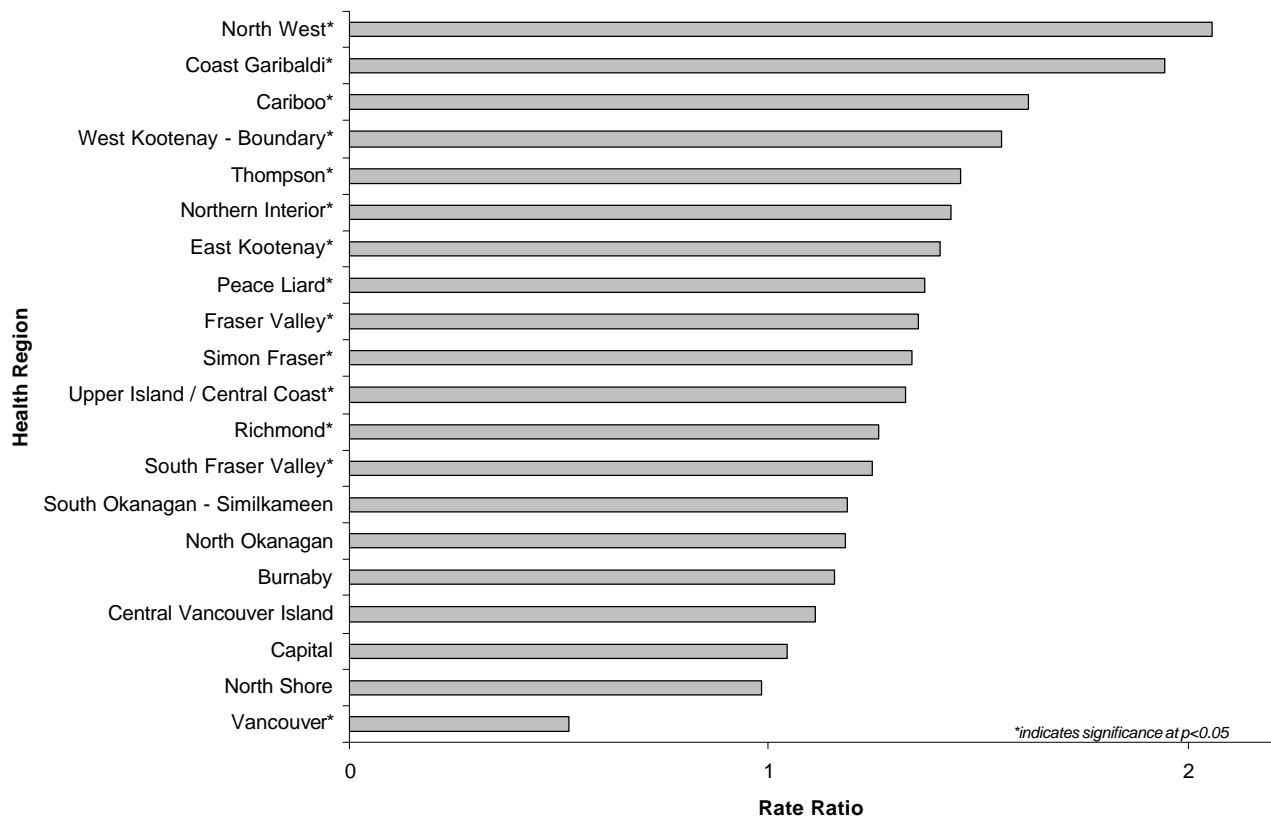


Figure 3.24: Annual Average Age-Specific Hospital Separation Rate Ratio, 1987-1998, BC, by Health Region, Males, Ages 80+**Figure 3.25:** Annual Average Age-Specific Hospital Separation Rate Ratio, 1987-1998, BC, by Health Region, Females, Ages 80+

Nature of Injury

NATURE OF INJURY BY GENDER

The average annual age-standardized hospital separation rates due to injury by nature of injury and gender are presented in Figure 3.26. The nature of injury was not specified in approximately sixteen per cent of the cases. Fractures of the Lower and Upper Limb as well as Poisoning were more common among females than among males. See Appendix B-6a for 95% Confidence Intervals.

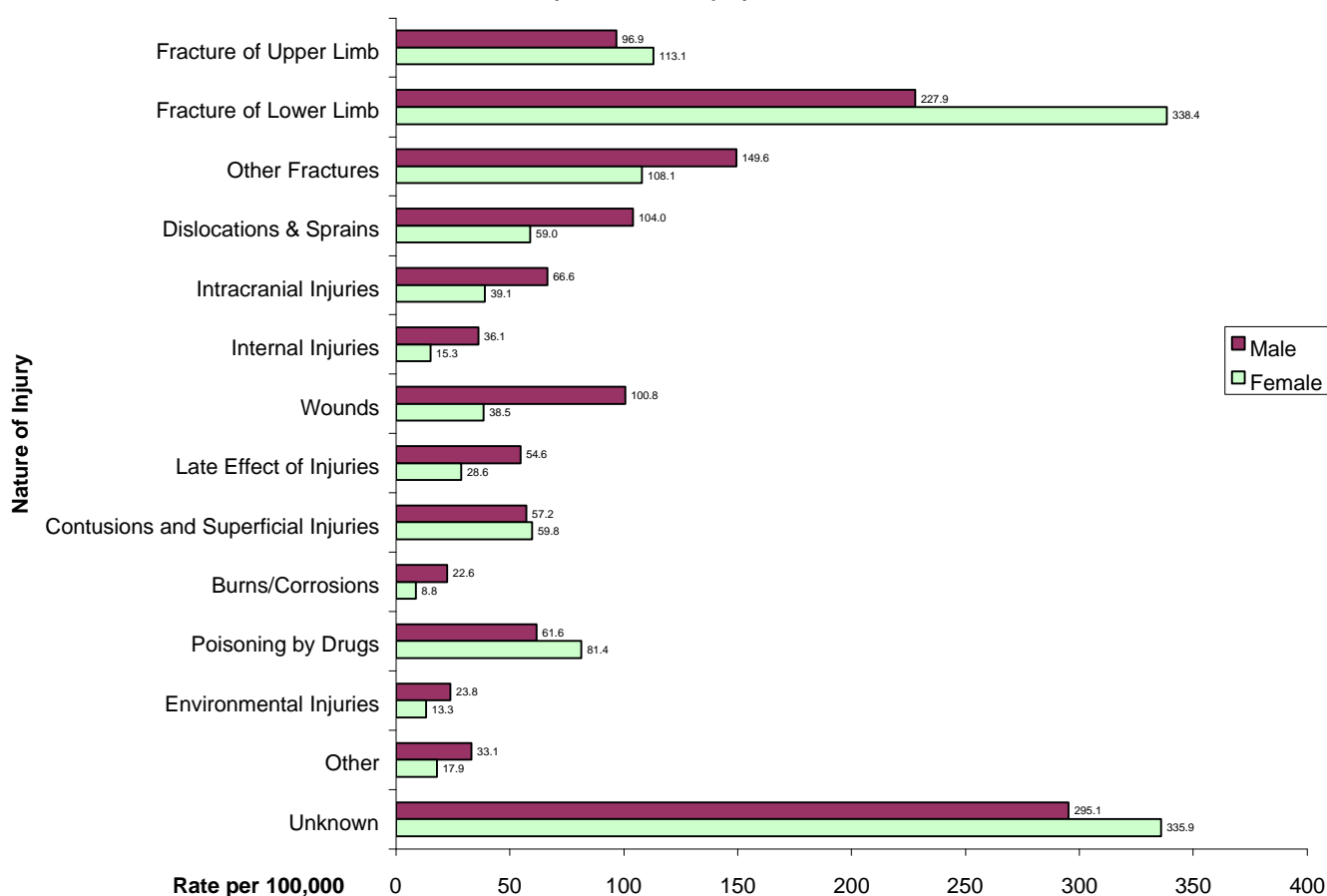
Males

Among males, high rates were found for Fractures of Lower Limb (227.9 per 100,000), Other Fractures (149.6 per 100,000), Dislocations and Sprains (104.0 per 100,000) and Wounds (101 per 100,000). (Figure 3.26) [Appendix B-6a]

Females

Among females, high rates were found for Fractures of the Lower Limb (338.4 per 100,000), Fractures of the Upper Limb (113.1 per 100,000) and Other Fractures (108.1 per 100,000). [Appendix B-6a]

Figure 3.26: Annual Average Hospital Separation Rates, 1987-1998, BC, by Nature of Injury and Gender



NATURE OF INJURY BY AGE GROUPS AND GENDER

Age Group 25-34

Males

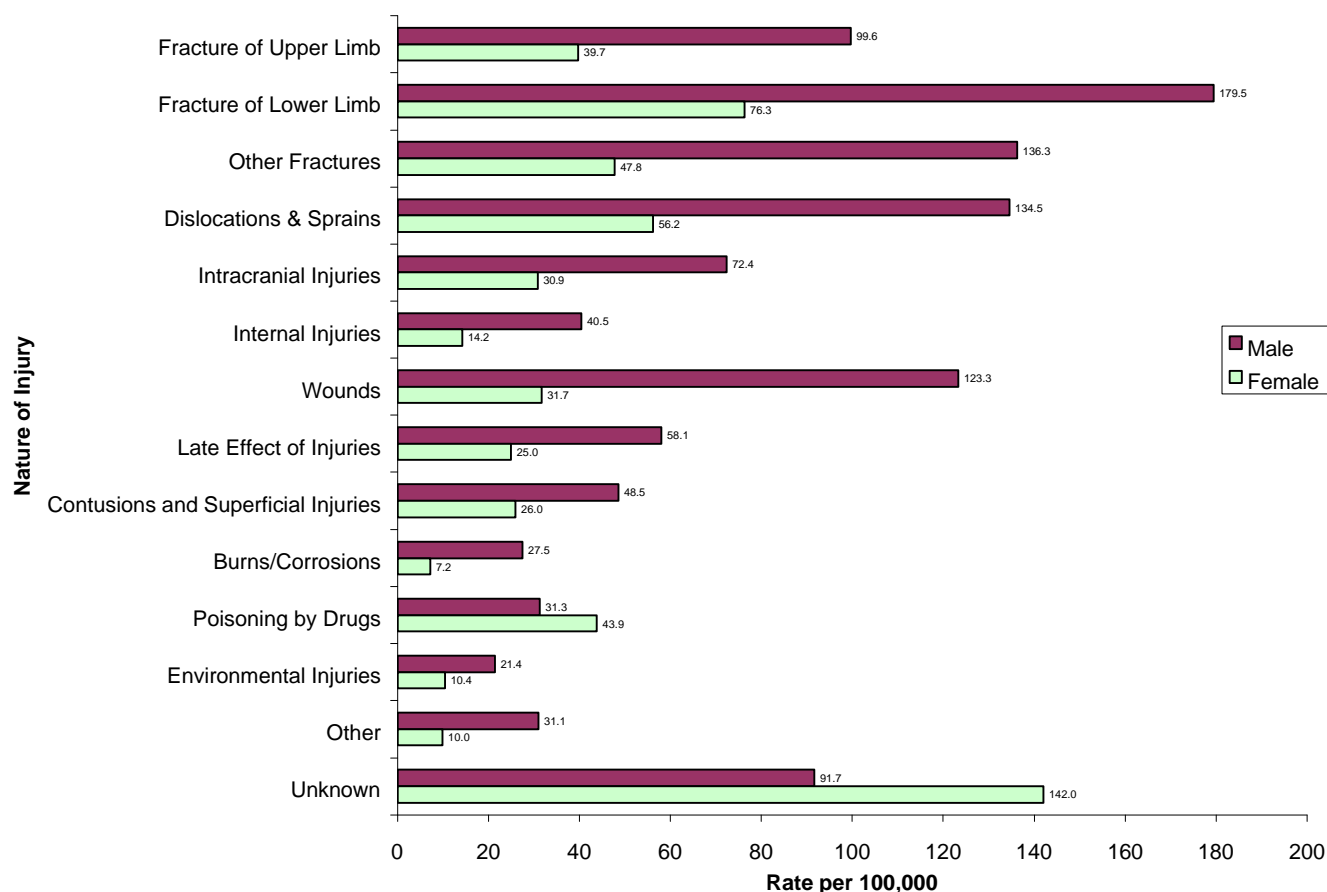
The distribution of hospital separation rates among adults in the 25-34 years age group by nature of injury and gender is shown in *Figure 3.27*. Rates were higher among males except for Poisoning by Drugs. The most common injuries among males were Fractures of the Lower Limb (179 per 100,000). Other Fractures (136 per 100,000), Dislocations and Sprains (136 per 100,000) and Wounds (123 per 100,000) had significantly lower rates than the first two most common injuries. Fractures of the Upper Limb were significantly less common than Fractures of the Lower Limb.

[Appendix B-6a]

Females

Among females, Fractures of the Lower Limb had the highest rate of 76 per 100,000. Dislocation and Sprains, Other Fractures and Poisoning by Drugs were the next most common injuries. [Figure 3.27, Appendix B-6a]

Figure 3.27: Annual Average Hospital Separation Rates, 1987-1998, BC, by Nature of Injury and Gender, Ages 25-34



Age Group 35-44

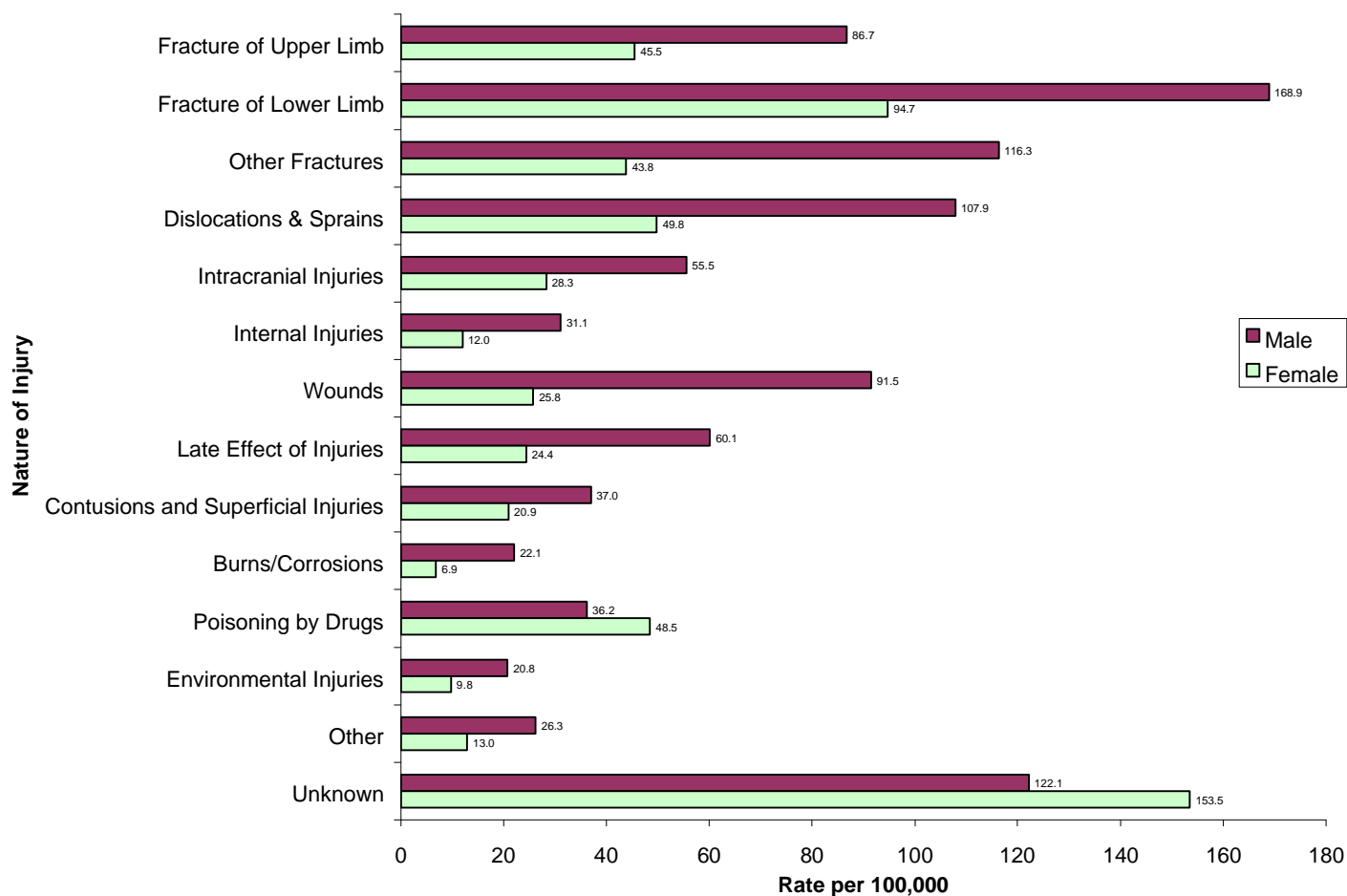
Males

The rates for this group were very similar to those among males, 25-34 years old. Fractures of the Lower Limb were also the highest with a rate of 169 per 100,000, followed by Other Fractures (116 per 100,000) and Dislocations and Sprains (108 per 100,000). [Figure 3.28, Appendix B-6b]

Females

Fractures of the Lower Limb showed a much lower rate (95 per 100,000) than for males; followed by Dislocations and Sprains (50 per 100,000), Poisoning by Drugs (49 per 100,000), and Other Fractures (44 per 100,000). [Figure 3.28, Appendix B-6b]

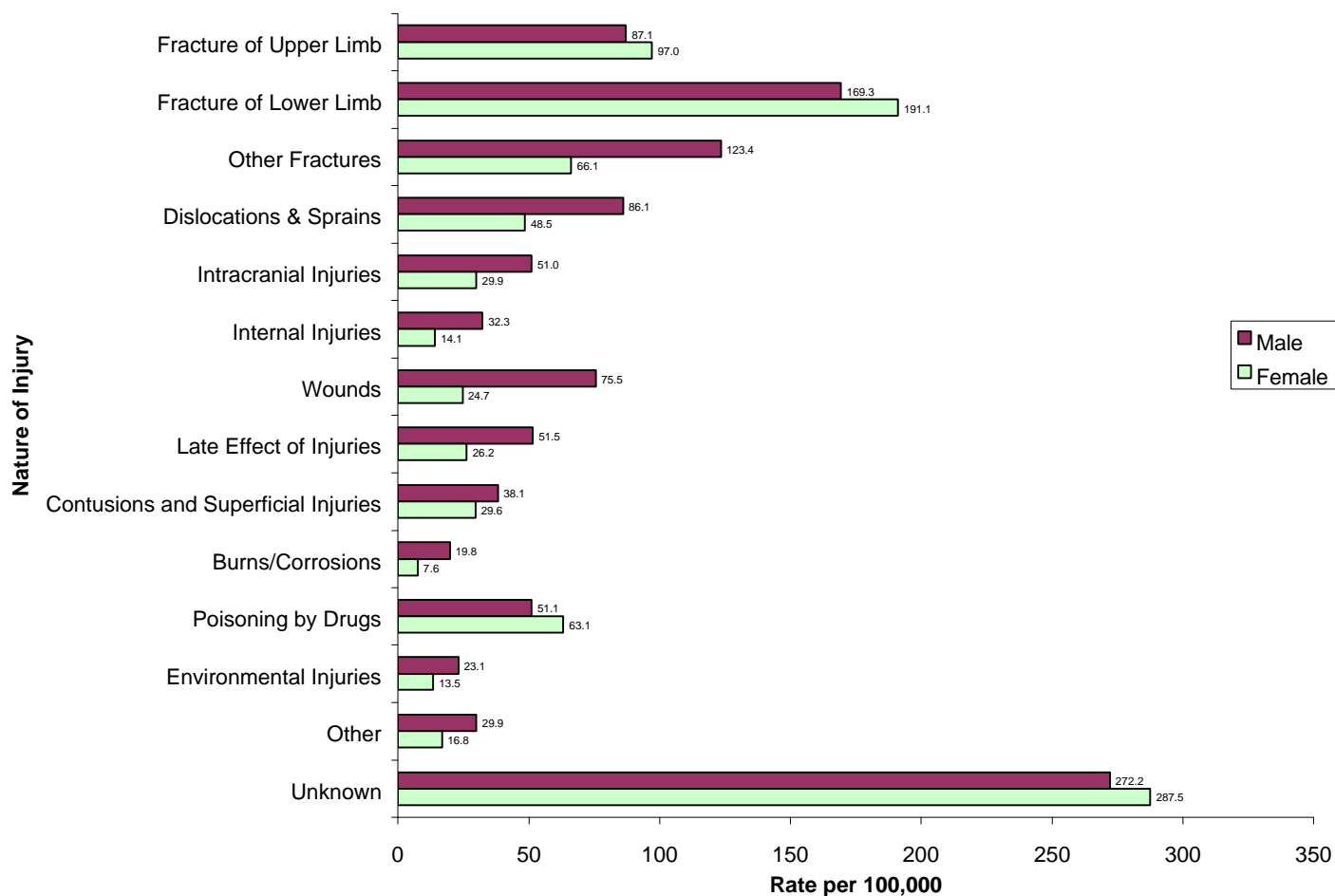
Figure 3.28: Annual Average Hospital Separation Rates, 1987-1998, BC, by Nature of Injury and Gender, Ages 35-44



Age Group 45-64**Males & Females**

The distribution of nature of injury among males and females in the 45-64 years age group was different from those for younger age groups. There was an apparent increase in fractures among females. Females experienced higher rates of Fractures of Lower and Upper Limb than males. Rates for Poisoning were also higher for females than males. Fractures of Lower Limb had a rate of 169 per 100,000 for males and 191 per 100,000 for females. Next were Other Fractures (123 per 100,000 for males and 66 per 100,000 for females) and Fractures of the Upper Limb (87 per 100,000 for males and 97 per 100,000 for females). [Figure 3.29, Appendix B-6c]

Figure 3.29: Annual Average Hospital Separation Rates, 1987-1998, BC, by Nature of Injury and Gender, Ages 45-64

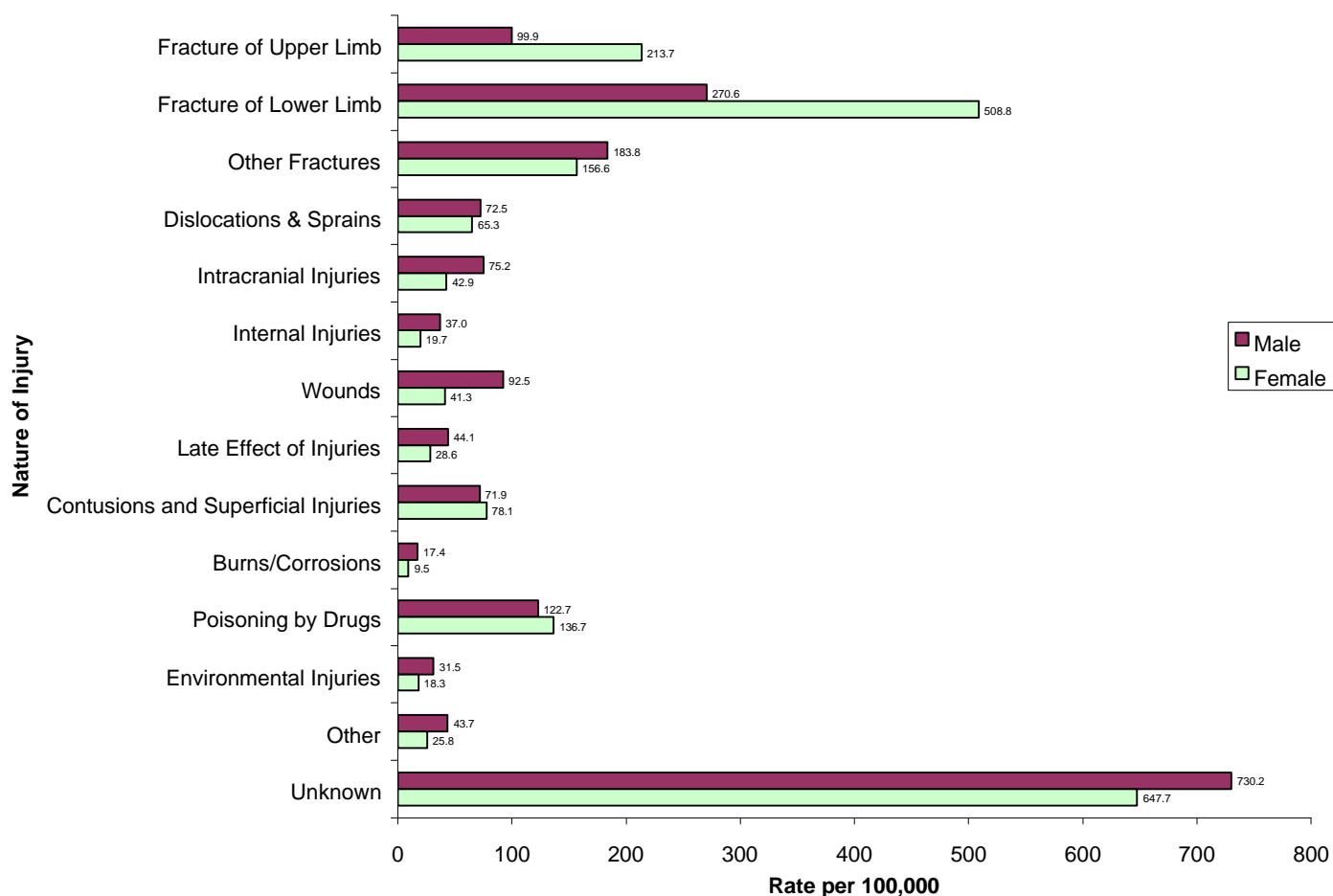


Age Group 65-74

Males & Females

The distribution of hospital separation rates by nature of injury among the 65-74 years age group is presented in *Figure 3.30*. In comparison with adults aged 45-64 years, there was an increase in the rates related to fractures. Fractures of the Lower Limb occurred with a rate of 271 per 100,000 among males and 509 per 100,000 among females. Among males, Other Fractures and Poisoning followed with a rate of 184 per 100,000 and 123 per 100,000 respectively. Among females, Fractures of the Upper Limb and Other Fractures followed with rates 214 per 100,000 and 157 per 100,000, respectively. [Appendix B-6d]

Figure 3.30: Annual Average Hospital Separation Rates, 1987-1998, BC, by Nature of Injury and Gender, Ages 65-74



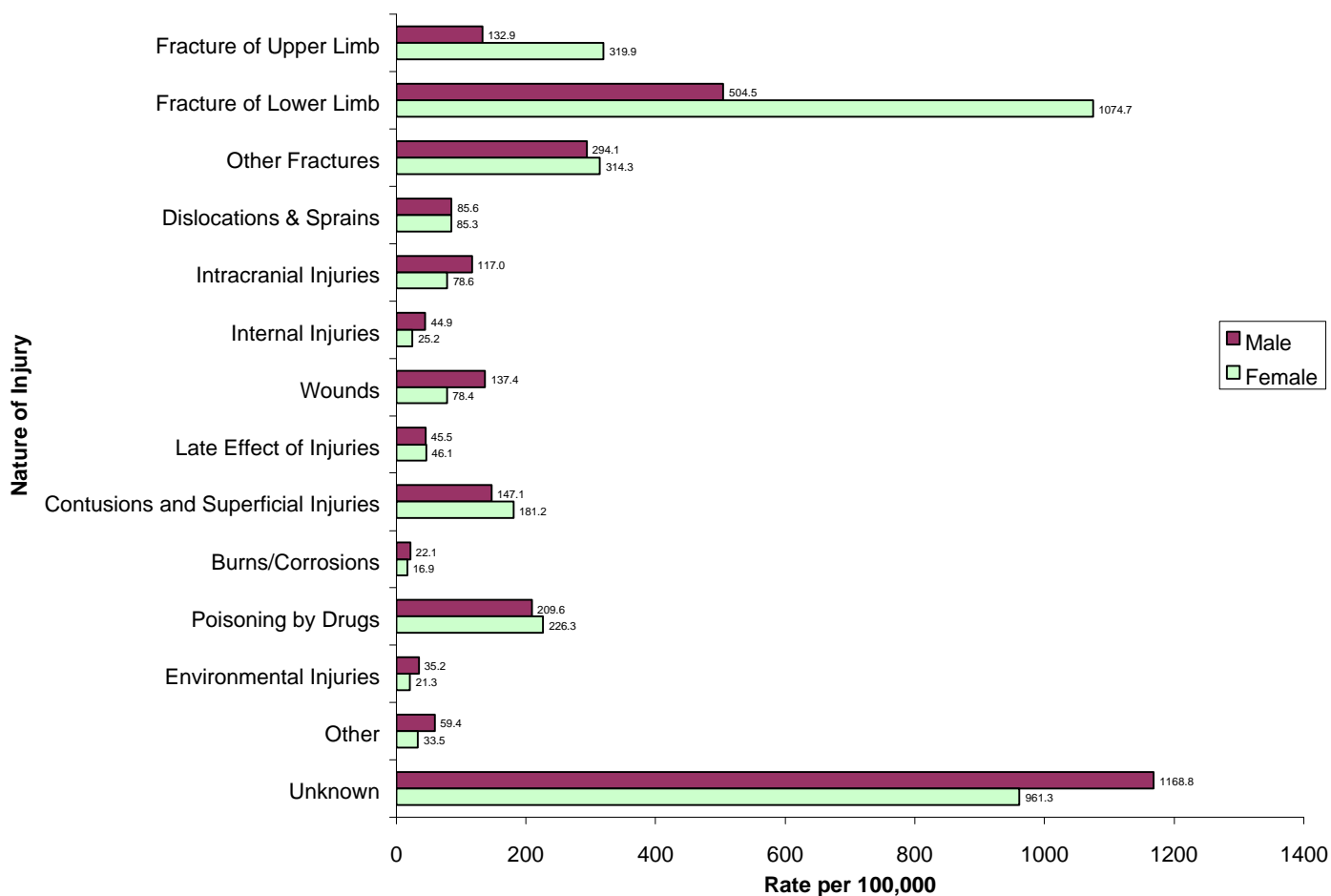
Age Group 75-79**Males**

Fractures of the Lower Limb were approximately two times more common among males aged 75-79 years old than males in the 65-74 years age group. Other Fractures increased to 294 per 100,000, as well as Contusions and Superficial Injuries (147 per 100,000). Poisoning by Drugs followed with a rate of 210 per 100,000. [Figure 3.31, Appendix B-6e]

Females

Fractures of the Lower Limb were the most common injury among females 75-79 years (1075 per 100,000). They were about five times higher in comparison with 65 to 74-year-old females. The second most common were Fractures of Upper Limb (320 per 100,000) and Other Fractures (314 per 100,000). [Figure 3.31, Appendix B-6e]

Figure 3.31: Annual Average Hospital Separation Rates, 1987-1998, BC, by Nature of Injury and Gender, Ages 75-79

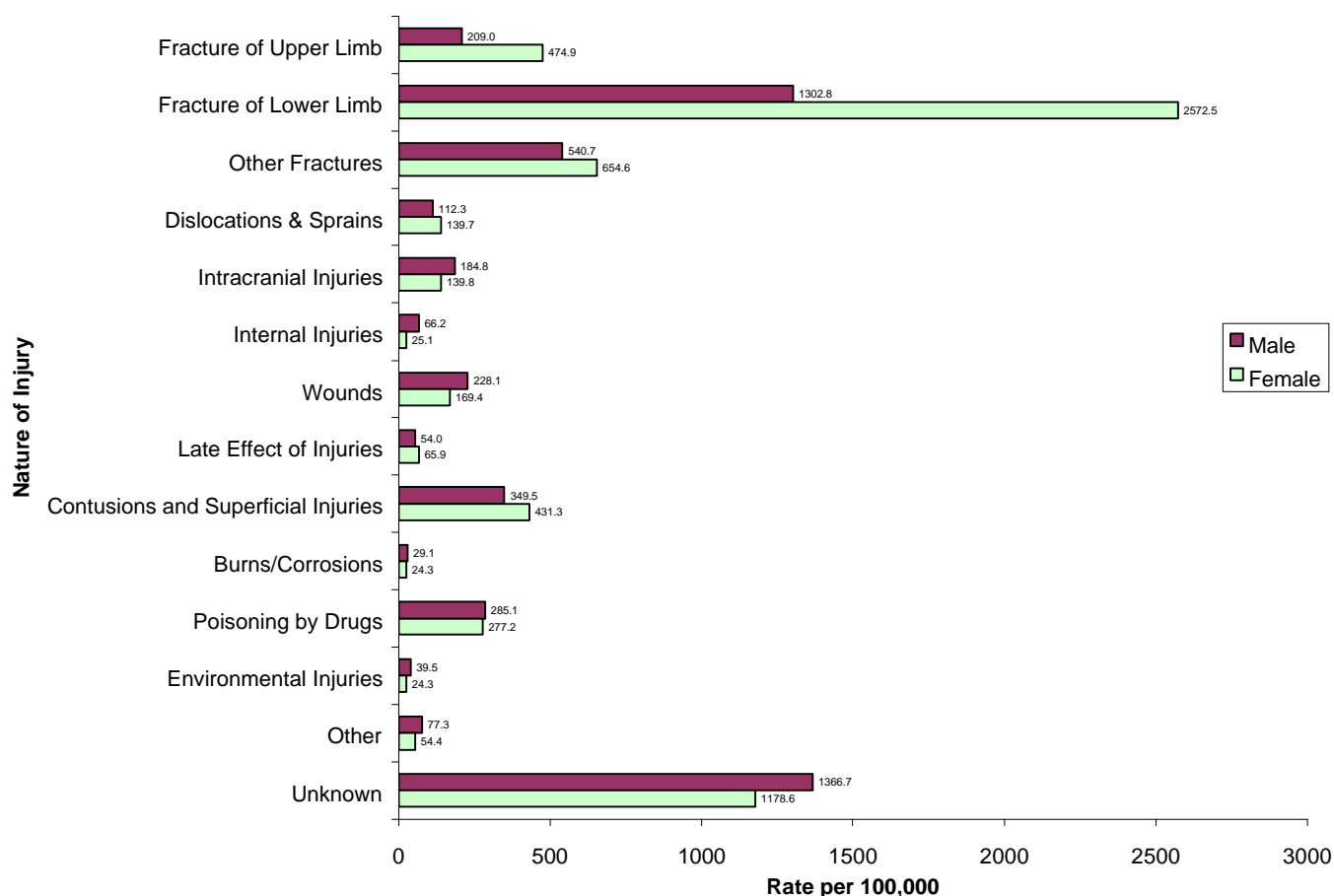


Age Group 80+

Males & Females

Among males and females, the most common injuries were Fractures of the Lower Limb (1303 per 100,000 for males and 2572 per 100,000 for females). Other Fractures were next (541 per 100,000 for males and 655 per 100,000 for females). The third most common nature of injury was Fractures of the Upper Limb (475 per 100,000 among females and 209 per 100,000 for males). [Figure 3.32, Appendix B-6f]

Figure 3.32: Annual Average Hospital Separation Rates, 1987-1998, BC, by Nature of Injury and Gender, Ages 80+



Place of Occurrence of Injuries

PLACE OF OCCURRENCE FOR ALL CAUSES

The average annual hospital separation rates by gender for each place of occurrence are presented in *Table 3.3*. Place of occurrence of the injury was not documented in approximately 51 percent of the cases. Based on the available information, the order of the three most common places of injury occurrence was different between genders. The Home was by far the most commonly specified place of occurrence of injury for both males and females (233 and 322 per 100,000, respectively). Among males, the second most common place of injury occurrence was Work Place (104 per 100,000), followed by Place for Recreation and Sport (65 per 100,000). Among females, the second most common place of injury occurrence was a Residential/Institutional Place (102 per 100,000).

[Appendix B-7, B-8]

PLACE OF OCCURRENCE BY AGE AND GENDER

Males

Hospital separation rates among males by place of injury occurrence are presented in *Figure 3.33*. The injuries occurring at home increased with age. The same pattern was also seen for injuries that occurred in Residential/Institutional Places. As expected, injuries occurring at Work Place and Place for recreation decreased with age. On a lower scale, injuries that occurred on the Street/Highway and injuries occurring in Public Buildings increased with age.

[Appendices B-8, B-9a]

Females

A similar pattern of hospital separations for Home injuries was found for females, with an important increase with age. The highest rates were among 80 year olds and older (2213 per 100,000). A notable increase with age was seen in injuries occurring in Residential/Institutional Places. The patterns of injuries occurring on Street/Highway and in Public Buildings were similar to those for males. [Figure 3.34, Appendices B-8, 9b]

Table 3.3: Average Annual Hospital Separation Rates, 1987-98, BC, per 100,000, Ages 25+, by Place of Occurrence and Gender.

Place of Occurrence	Male			Female			Total		
	Total 1987-98	Rate	Rank	Total 1987-98	Rate	Rank	Total 1987-98	Rate	Rank
Home	37402	233.25	1	53595	322.50	1	90997	278.67	1
Work Place	16724	104.29	2	1491	8.97		18215	55.78	
Place for Recreation / Sport	10380	64.73	3	5088	30.62		15468	47.37	
Street / Highway	2847	17.75		4394	26.44		7241	22.18	
Public Building	3437	21.43		5156	31.03		8593	26.32	
Residential Institutional	7754	48.36		16973	102.13	2	24727	75.72	2
Other Specified Places	6694	41.75		3788	22.79		10482	32.10	
Unspecified Places	12453	77.66		9544	57.43	3	21997	67.36	3

Figure 3.33: Annual Average Age-Specific Hospital Separation Rates, Males, by Place of Occurrence and Age Group

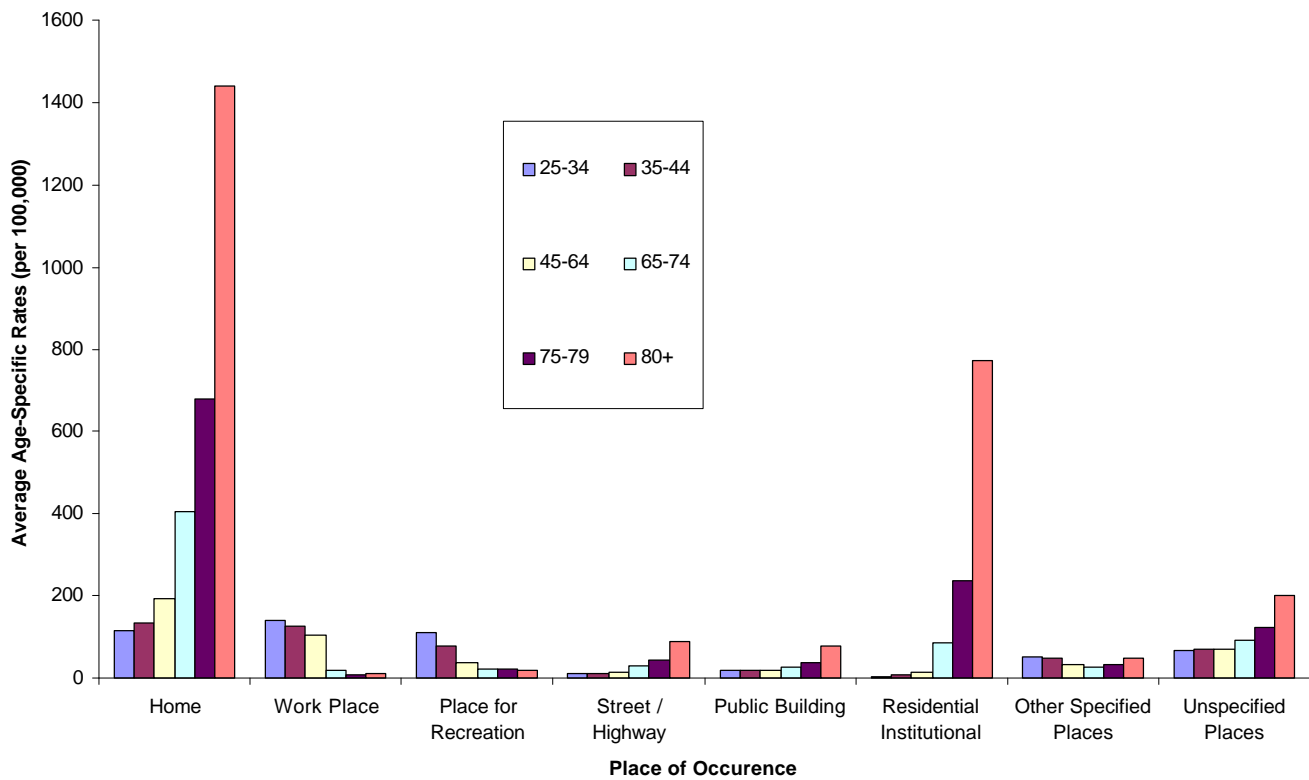
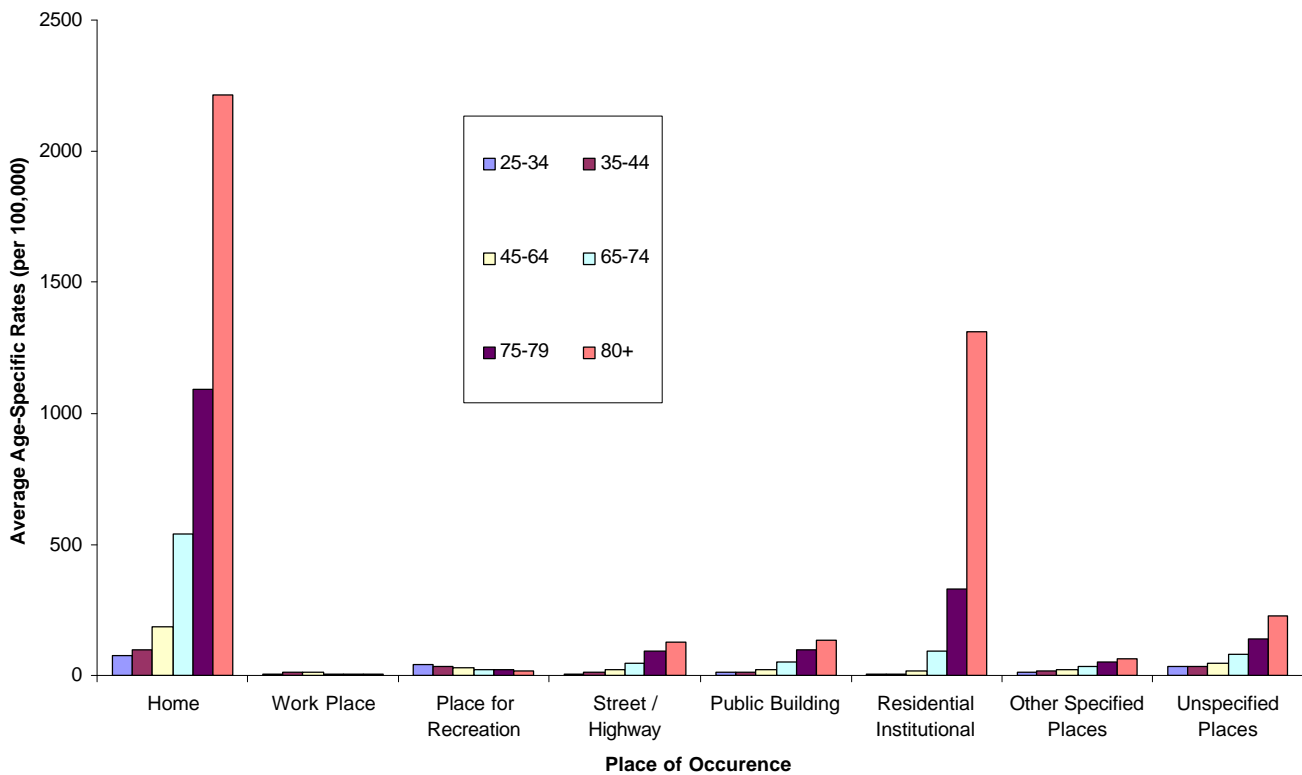


Figure 3.34: Annual Average Age-Specific Hospital Separation Rates, Females, by Place of Occurrence and Age Group



OPPORTUNITIES FOR ACTION

Overview of Main Results

In this report we set out to examine the first step in the Injury Prevention and Evaluation Cycle (IPEC). We assessed the burden of injuries among adults and seniors in British Columbia and began to explore the second step in the cycle: identifying risk factors and risk conditions for these injuries. This assessment was completed by calculating injury rates and examining the variation across age groups, gender, geographic locations, and calendar years. The profile developed reveals, at the aggregate level, some emerging priorities toward which injury prevention efforts should be directed. In this section of the report, we will provide a review of the main results of this study, discuss relevant principles of injury prevention and suggest general recommendations to address the problem of unintentional injuries. These recommendations have the potential to target a broad array of injury outcomes. Finally, based on each of the main results of this study, we will present specific recommendations.

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.

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 two leading causes of death by injury. Drowning was a leading cause especially in younger age groups (e.g., 25-34 year olds), while Poisoning and Suffocation were leading causes of death among seniors aged 65 years and over. Finally, for those aged 75 years and older, Fire was the fifth leading cause of death.

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. 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.

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.

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.

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. In adults 45 years and older, Falls, Adverse Effects, Motor Vehicle, and Misadventure were the four leading causes. In addition, among the 75 years and older age group, Poisoning emerged as the fifth leading cause of injury hospitalization.

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

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.

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. Higher rates were observed for Fractures of the Lower Limb among the 75-79 years age group (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, the most common types of injuries were Fractures (Fractures of the Lower and Upper Limb and Other Fractures).

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 females, rates of injuries in Residential/Institutional Place increased noticeably with age.

Prevention and Policy Implications

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 first step of the IPEC cycle has helped assess the burden of injury by identifying consistent patterns of injury based on age, gender, time and geographic locations. These patterns are an indication of differences in risk factors and conditions that need further investigation in the second step of the cycle.

GENERAL PRINCIPLES AND RECOMMENDATIONS FOR PREVENTION

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.

Importance of DATA in IPEC

There is a need to broaden the scope of injury data collection, to provide a more complete account of the burden of injuries and their patterns and to identify the risk factors and risk conditions of injury. This, in turn, will assist in designing better injury prevention and control measures. Injury surveillance is an integral part of prevention as it provides the necessary baseline of injury information leading to prevention and control. IPEC highlights the importance of improving data collection for:

- Assessment of the burden of injuries, risk factors and conditions (Steps 1 & 2);
- Evaluation of the effectiveness and efficiency of interventions and programs (Steps 3 & 4);
- Synthesis, implementation, and monitoring of new interventions and programs (Steps 5 & 6);
- Reassessment of the burden of injury (Step 7), and the continuation of the cycle.

Appropriate data (either preexisting or new) are required to efficiently address injury prevention and control. A large number of studies in injury have focused solely on mortality as an important indicator because these data are easily obtainable and routinely collected. However, mortality data represent only the tip of the pyramid of injury. It does not give a complete account of the magnitude of the burden of injuries. As indicated in *Figure 1.3* of the injury pyramid, mortality-based data do not reflect the extent of an injury problem because most people who are injured do not die from their injuries (Hader & Seliske, 1993).

Recommendation 1: Develop, implement and evaluate a comprehensive data collection system including emergency departments in BC.

In order to develop a provincial and regional profile of unintentional injuries among adults and seniors in this study, we combined the information from both mortality and hospitalizations. The resulting profile provides a broad perspective on the problem of unintentional injuries from at least two levels of the injury pyramid. However, there is a need for ongoing and systematic injury surveillance at the level of emergency departments. With support from Health Canada, BCIRPU is now testing the implementation

of an Emergency Department Injury Surveillance System (EDISS).

In addition to surveillance, ongoing documentation of unintentional injuries is vital. A combination of data sources would include, but not be limited to, ICBC, BC Vital Statistics Agency, BC Office of the Coroner, Hospital Separation data, and emergency department data. As it is estimated that only between 5% to 13% of injured persons reporting to the ED are hospitalized, much clinical and circumstantial information on injuries is missed by injury surveillance systems using only fatality or hospital data. Such an approach should involve a comprehensive system including all emergency departments in BC.

In addition, more targeted studies would address specific safety issues (e.g., public perception regarding safety devices) as well as program implementation issues. A comprehensive data collection system would help broaden the scope of injury data collected while further analysis would assist in designing better preventive measures for the reduction of unintentional injuries. It would also provide relevant information geared toward specific performance measures.

Recommendation 2: Develop, implement and evaluate a set of performance measures for injury interventions.

Performance measures should be based on the data needed for each step of the IPEC. Four broad areas include measurements related to analysis, development of intervention design, implementation of interventions and evaluation.

The analysis (burden of injury assessment) phase should include not only analysis of injury data but also analyses related to the sociopolitical and cultural environments where injuries occur. Indicators would include: population demographics, ethnic composition,

occupations and economic level of communities, key legislative committees and supporters, groups likely to oppose or be in competition with prevention efforts, as well as task forces to advise injury activities.

Measurements related to design development activities include monitoring the development of a comprehensive plan, targeting of high-risk groups and injuries, proposing interventions based on mortality and morbidity behavioral risk factors, collecting data for the defined geographic area/target group, identifying and involving important individuals (experts, community leaders), and selecting effective interventions (evidence-based interventions combining education, environmental modification, and legislation/regulation). Measurements related to essential implementation activities include monitoring collaboration, staff training, integration (e.g., information sharing across program areas), and use of appropriate strategies (interventions are acceptable and multifaceted, legislative/regulatory initiatives are feasible). Finally, measurements related to key evaluation activities include evaluation plans and the selection and definition of relevant outcomes (e.g., incidence and severity of specific injuries).

In order to be effective, these performance measures must be included as an integral part of the data to be collected routinely for the IPEC model. Such a system requires a coordinated effort of many key players in the fields of public health, medicine, law enforcement, and politics as well as the wider community to be organized and united into a planned health promotion approach. Hence the need for a reinforced political commitment to the prevention of unintentional injuries.

Recommendation 3: Reinforce the political commitment to injury prevention within integrated strategies that address both environmental (physical and social) and health impacts of various social activities.

Experiences from various countries highlight the need to broaden safety interventions to strategies that combine both environmental and health gains (Dora & Racioppi, 2000). This approach calls for a complete rethinking of the need for and nature of various social activities such as transport, work, sports and recreation. Such a strategy would require an improved knowledge of the pattern of social involvement in these activities. For example, transport activities can be described by population patterns of road and land use (especially in regions of high-risk) and by the transport consumption patterns. Examples of strategies that combine health gains with environmental gains would include measures that deter the use of motor vehicles (e.g., by restricting the provisions of parking spaces), and increase the attractiveness of other modes of transport (e.g., improving rail and public transport services).

However, the effective implementation of such a strategy should start with a strong commitment that combines the political will and resources of different sectors and stakeholders. Such political commitment can create the momentum to develop policies that ensure high levels of health protection (EU, 1997). A set of agreed principles could be adopted in the form of a Charter that includes action plans to:

- Promote trans-sector collaboration to prevent and control injuries (e.g., among stakeholders in the areas of health, transport, education, rehabilitation, substance abuse and public safety)
- Monitor specific high-risk social activities and their impact on health (e.g., the transport environment and strategies and their impact on health)
- Secure funding for pilot projects and research.

Recommendation 4: Build and sustain injury research capacity through relevant training and the development of comprehensive research strategies to foster multidisciplinary collaboration and pooling of expertise and resources.

Building and reinforcing research capacity in the area of injury prevention and control would also contribute to the development and implementation of relevant strategies. Training of future leaders should be developed at the MSc and PhD levels as well as through topic-specific curricula for adult learners. There is also a need to strengthen the links between the existing research expertise in pediatrics, child health, psychology, epidemiology, public health and researchers in Emergency Medical Services, acute care and rehabilitation as well as those in engineering, industry and the social sciences (CIRNET, 2000).

SPECIFIC RECOMMENDATIONS

Age and Gender Differences

Recommendation 5: Increase the support for research in the magnitude, etiology, biobehavioural and psychological determinants of injuries among seniors and elderly.

This report showed higher rates of fatal and non-fatal unintentional injuries among seniors aged 75 years and over than among younger age groups. In Canada, there is a projected increase in the population of seniors aged 65 years and over rising from the current 13% to 22.7% of the total population by 2031 (Elliot, Hunt, & Hutchinson, 1996). This result underlines the need for increased focus on the prevention and control of injuries among seniors and elderly.

Gender differences were also observed across age groups with an increased susceptibility to injuries among females 75 years old and over. However, the literature suggests that males tend to take more risk than females. For example, compared to young female

drivers, young males tend to underestimate the effect of alcohol and drugs on their driving performance (Farrow, 1985; Begg & Langley, 1999). More research is needed to understand the behavioral and psychological factors that contribute to gender differences in injury.

Leading Causes

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., altering 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.

In previous analyses of BC mortality data related to motor vehicle crashes, alcohol was present in a high percentage of deaths (Soubhi, Rajabali, & Raina, 2000). This result was consistent across male and female drivers, passengers and pedestrians. Almost three-quarters of all drivers involved in alcohol related motor vehicle injury deaths were legally impaired. It was also noted that the proportion of legally impaired male drivers was about twice that of female drivers. Across policing jurisdictions, alcohol as a contributing factor was involved in motor vehicle traffic deaths in about 92%, 91%, 87% and 88% of the cases respectively in the Northern, Southeast, Southwest and Greater Vancouver/Greater Victoria. Finally, it was also noted that about half of these alcohol related deaths were evenly distributed across the Northern jurisdiction and the Greater Vancouver/Greater Victoria (about 25% in each jurisdiction). While much has been done through education and enforcement to discourage drinking and driving, it remains a serious concern.

Recommendation 6: Ensure that efforts directed against drinking and driving are comprehensive and incorporate legislation, improved detection equipment, public education and the judicial process.

Legislative interventions are related to either legal drinking ages or blood alcohol limits. Though studies evaluating the increase of legal drinking ages found decreased youth mortality rates (Hingson, Howland, and Levenson, 1988), few were able to show a decrease in drinking-driving behaviour (Hingson, Scotch, Mangione et al., 1983). Changes to legal blood alcohol levels showed the greatest impact where the legal limit was .00% (Hingson, Heeren, & Winter, 1994). However, this type of measure would require a consistent judicial system. In the last 10 years, the number of 24-hour prohibitions has been steadily

increasing (Ministry of Attorney General, 2000). On the other hand, there is not enough evidence to suggest that criminal code convictions are issued and stayed by the court. More research is required to document these issues in order to increase police and public confidence in the judicial process. Counter Attack programs, implemented in BC since 1995, are excellent initiatives which have seen public visibility expand by means of their periodic reminders using a variety of media. With this success in mind, activities of the police forces should move increasingly beyond law enforcement to include the creation and promotion of traffic safety messages.

Recommendation 7: Expand the focus of Motor Vehicle Traffic injury control to include the detection of a combination of alcohol and drugs.

A combination of alcohol and drugs is often found in similar proportions among males and females as a contributing factor to motor vehicle traffic deaths (Soubhi, Rajabali, & Raina, 2000). Other research has shown that drugs other than alcohol contribute to a significant number of traffic fatalities in BC (Mercer & Jeffery, 1995). It is notable that the Canadian Federal Justice Ministry recently recommended amending the Criminal Code to permit compulsory urine or blood testing when drug impairment is suspected (Mercer & Jeffery, 1995). Such an amendment should be encouraged. With regard to prescription drugs, rather than training police officers to detect drivers impaired by substances other than alcohol, we suggest that physicians and families should be encouraged to intervene when a driver's ability may be impaired while taking medication. Constant tips and seasonal reminders need to be developed using a variety of media. Well-developed communication strategies should be developed to increase awareness about monitoring drug use and the dangers of multiple medications.

Recommendation 8: Ensure that driver license renewal and acquisition is comprehensive for both young and older drivers.

Programs for new drivers are needed, including provisional and probationary licenses, and rewards or incentives for responsible and safe driving. Most of the research evidence supports comprehensive policies and programming for new drivers. Ferguson, Leaf, Williams, and Preusser (1996) compared licensing practices across five states of the US with similar weather patterns and geography. This survey of high school students found that two states licensed drivers at age seventeen and three at age sixteen; two of the latter states also had mandatory driver education. The results showed that the highest crash rate was found where the licensing age was sixteen, and driver training was not required. Two other strong indicators were the experience of the new driver and night driving curfews, both of which were significantly correlated with decreased motor vehicle crashes.

Periodic re-testing of drivers' ability to drive is also recommended. In this regard, the methods used in testing driver's ability should be sensitive enough for accurate assessment of fitness to drive. Physicians and families should be encouraged to intervene when a driver's ability is impaired by chronic illness. It is also important to provide convenient alternatives in the form of public transportation and special transportation programs. This is particularly significant in rural areas where the options can be limited.

Recommendation 9: Continue to encourage the use of occupant restraints through legislation and education.

Research has shown that a greater percentage of car crash fatalities occur among drivers that are unrestrained or sub-optimally restrained. Research is recommended in the area of cultural beliefs of populations and in how these beliefs affect safety

practices such as the use of seat belts (O'Donnell & Mickalide, 1998). Educational programs involving classroom education and social learning techniques have led to increased restraint use (Stulginskas & Pless, 1983; Decina, Temple, & Dorer, 1994; Martinez, Levine, Martin, & Altman, 1996). However, as is typical of most non-reinforced behaviours, improvements were noticed early in the intervention and usually diminished over time.

Enforcement should include legislative changes such as fewer exemptions and the addition of demerit points or higher fines (Guerin & MacKinnon, 1985; Stuy & Green, 1993). The effectiveness of air bags in preventing fatalities has been measured and it was found that driver fatalities in cars with air bags were 28% lower than those in cars with manual belts alone (Zador & Ciccone, 1993).

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 as suggested by IPEC. Data currently available 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).

Recommendation 10: Develop a provincial coordinated program of fall surveillance to improve epidemiologic research on falls and strategic planning of fall prevention. Such a program should be able to monitor high-risk groups based on a better understanding of the risk factors and conditions associated with the occurrence of falls.

The etiology of a fall seems to be a combination of factors that reflect physical, cognitive, behavioral and social conditions operating alone, or in combination with environmental hazards (O'Loughlin, Robitaille, Boivin, & Suissa, 1993; Speechley, & Tinetti, 1991). These factors are generally classified as intrinsic and extrinsic factors and have received varying levels of scientific evidence. Intrinsic risk factors with strong to moderate scientific evidence include (Fildes, 1994; Satting, 1992; Nevitt 1990): age-related decline; medical conditions such as stroke, arthritis and Parkinson's disease; disturbances of balance and gait; and certain types of medication, such as sedatives and anti-depressants (Nevit, 1990). Extrinsic risk factors have had rather low scientific support (Campbell et al., 1990): poor design or condition of stairways; inadequate lighting; slippery floors; furniture; unsecured mats and rugs; lack of non-skid surfaces in bathtubs and bathrooms (Nevitt, 1990; Fildes, 1994; Sattin, 1992; Day et al., 1994)

Strategies of interventions to reduce falling in the elderly can be grouped under three categories: exercise programs or gait balance training; home assessment/modification programs; and multi-component interventions that target more than one risk factor.

In general, exercise programs or gait and balance training to reduce falls in the elderly have shown mixed results (Galindo-Ciocon, Ciocon, & Galindo, 1995; Lord, Ward, Williams, & Strudwick, 1995; Wolf et al., 1996;). One factor, however, which undermines the efficacy of exercise interventions, or interventions

in general, is maintaining adherence to the program (Lord, Ward, Williams, et al., 1995).

Home assessments to identify falling hazards, and home modifications to remove them, seem to be a promising way to reduce the occurrence of falls. (Hindmarsh & Estes, 1989; Josephson, Fabacher, & Rubenstein, 1991; Shroyer, 1994; Tideiksaar, 1996). One advantage of home modification approach is that some of the modifications are relatively permanent (e.g. grab bars in the bathroom), thereby becoming cost effective by preventing falls over a long period. However there is potential for adding regular, ongoing home inspections to assess and modify any new hazards (slippery rugs, loose steps, inadequate lighting).

Further research is needed to replicate results from different studies, examine the long term outcomes, and determine whether other means, such as ongoing home inspections, can increase the efficacy of home based modifications for reducing falls among the elderly.

Finally, multifactorial programs have shown evidence of success; therefore, interventions targeting more than one risk factor for falling are likely to enhance the power of the intervention. Furthermore, there are many risk factors for falls among the elderly; with this in mind, it makes sense to design interventions which address, at least, the most prominent of these risk factors.

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 is an emerging priority which 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 understanding of the socioeconomic and regional variations in this emerging priority in BC.

In developed countries, unintentional fatal poisoning often involves illegal drugs and the victims are usually adults (Baker et al., 1998). It is also known that death rates from poisoning tend to be higher among the poorest quintile of the population compared to the richest. This socioeconomic difference in the occurrence of poisoning has been found to be about five times for men and three times for women in Canada (Wilkins et al., 1989).

Multiple substances are often involved in poisoning, such as alcohol and drugs, and the relative importance of different substances must be taken into account in assigning causality. This is often a source of considerable difficulty in the assessment of poisoning from pharmaceuticals. Gaps still exist in the area of drug interactions, overmedication in seniors, correct use of medications and risk perception (CIRNET, 2000). Effectiveness of known strategies, such as improved product closure design, labelling and other deterrents to ingestion, still needs to be accurately assessed (CIRNET, 2000).

Regional Variations

The pattern of regional differences identified in this study is consistent with 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 there-

fore 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.

Recommendation 11: Create and promote coordinated regional policies in the area of unintentional injuries.

It is at the local level that needs and resources should be identified, data collected, community support garnered and interventions implemented and evaluated. Regional policies should be defined based on informed consensus among various community stakeholders, health care providers, and legislative and public health agencies. An example of strategy targeting motor vehicle traffic based on the IPEC model could include:

- Identification of high-risk groups, risk factors (e.g., prevalence of high speed, alcohol impairment) and injury target areas based on local (community, local health area, or health region) data.
- Identification of needs and public perceptions regarding injuries and related preventive measures (e.g. low speed enforcement, seat belt use).
- Identification of key legislative committees and supporters, local groups likely to oppose or be in competition with prevention efforts, as well as

specific task forces to advise injury prevention activities.

- Building consensus around acceptable and multi-faceted injury prevention measures and ensuring that there is a mandate to implement them and that resources are earmarked to do so.
- Planning and implementing key evaluation activities with a mandate to oversee the whole process within an integrated approach to health and safety. Such an approach would include, for example, the creation of health region level injury control cabinets with several stakeholders including transport, education, rehabilitation, substance abuse services and public safety. To ensure coordination at the provincial level, such a cabinet could have an equivalent representative in the Ministry of the Attorney General or the Ministry of Health.

Conclusion

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.

As indicated by the IPEC model, 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.

Recommendation 1: Develop, implement and evaluate a comprehensive data collection system including emergency departments in BC.

Recommendation 2: Develop, implement and evaluate a set of performance measures for injury interventions.

Recommendation 3: Reinforce the political commitment to injury prevention within integrated strategies that address both environmental (physical and social) and health impacts of various social activities.

Recommendation 4: Build and sustain injury research capacity through relevant training and the development of comprehensive research strategies to foster multidisciplinary collaboration and pooling of expertise and resources.

Recommendation 5: Increase the support for research in the magnitude, etiology, biobehavioural and psychological determinants of injuries among seniors and elderly.

Recommendation 6: Ensure that efforts directed against drinking and driving are comprehensive and incorporate legislation, improved detection equipment, public education and the judicial process.

Recommendation 7: Expand the focus of Motor Vehicle Traffic injury control to include the detection of a combination of alcohol and drugs.

Recommendation 8: Ensure that driver license renewal and acquisition are comprehensive for both young and older drivers.

Recommendation 9: Continue to encourage the use of occupant restraints through legislation and education.

Recommendation 10: Develop a provincial coordinated program of fall surveillance to improve epidemiologic research on falls and strategic planning of fall prevention. Such a program should be able to monitor high-risk groups based on a better understanding of the risk factors and conditions associated with the occurrence of falls.

Recommendation 11: Create and promote coordinated regional policies in the area of unintentional injuries.

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APPENDIX A Mortality by Injury

Appendix A-1

Local Health Area Groupings by Health Regions, 1995, B.C.

Regional Health Board #	Regional Health Board	Local Health Area #	Local Health Area
01	East Kootenay	01 02 03 04 05 18	Fernie Cranbrook Kimberley Windermere Creston Golden
02	West Kootenay - Boundary	06 07 09 10 11 12 13	Kootenay Lake Nelson Castlegar Arrow Lakes Trail Grand Forks Kettle Valley
03	North Okanagan	19 20 21 22 78	Revelstoke Salmon Arm Armstrong-Spallumcheen Vernon Enderby
04	South Okanagan Similkameen	14 15 16 17 23 77	Southern Okanagan Penticton Keremeos Princeton Central Okanagan Summerland
05	Thompson	24 26 29 30 31	Kamloops North Thompson Lillooet South Cariboo Merritt
06	Fraser Valley	32 33 34 75 76	Hope Chilliwack Abbotsford Mission Agassiz-Harrison
07	South Fraser Valley	35 36 37	Langley Surrey Delta
08	Simon Fraser	40 42 43	New Westminster Maple Ridge Coquitlam
09	Coast Garibaldi	46 47 48	Sechelt Powell River Howe Sound

Continued next page

10	Central Vancouver Island	65 66 67 68 69 70	Cowichan Lake Cowichan Ladysmith Nanaimo Qualicum Alberni
11	Upper Island / Central Coast	71 72 84 85	Courtenay Campbell River Vancouver Island West Vancouver Island North
12	Cariboo	27 28 49 93	Cariboo-Chilcotin Quesnel Central Coast Eutsuk
13	North West	50 52 54 80 87 88 92 94	Queen Charlotte Prince Rupert Smithers Kitimat Stikine Terrace Nishga Telegraph Creek
14	Peace Liard	59 60 81	Peace River South Peace River North Fort Nelson
15	Northern Interior	55 56 57	Nechako Burns Lake Prince George
16	Vancouver	39	Vancouver
17	Burnaby	41	Burnaby
18	North Shore	44 45	North Vancouver West Vancouver-Bowen Island
19	Richmond	38	Richmond
20	Capital	61 62 63 64	Greater Victoria Sooke Saanich Gulf Islands

Appendix A-2

Causes of Unintentional Injuries by ICD-9 Code.

Cause of Injury	E-codes	Cause of Injury	E-codes
MV accidents-Occupant, Pedal Cycle Rider, Pedestrian, Motorcyclist	810-819, 822-825	Foreign Body	914-915
Non-MV Pedal Cycle	826	Struck by Object	916-918
Off-road motor vehicle	820-821	Machinery in Operation	919
Other or Unspecified Transport or Person	800-808, 827-829, 831, 833- 838, 840-848	Cutting/Piercing	920
Misadventure	870-876	Firearms	922
Postoperative Complications	878-879	Explosives	921, 923
Falls	880-888	Electricity	925
Environmental	900-909	Overexertion	927
Drowning & Submersion	830, 832, 910	Other	926, 928
Fire, Flames & Hot Substances (Burns)	890-899, 924	Late effects	929, 959, 969
Poisonings (Accidental)	850-869	Adverse effects.	930-949
Suffocations (Accidental)	911-913		

Note: Post-operative complications were not included in the analyses of this report given their heterogeneous nature and the type of preventive measures that might be considered appropriate.

Appendix A-3

Average Annual Age-Specific Mortality Rates per 100,000 and 95% Confidence Intervals.
by Gender and Age Group, B.C., 1987-1998

Age group	Male			Female		
	Rate	Lower Limit	Upper Limit	Rate	Lower Limit	Upper Limit
25-34	55.50	47.79	63.21	14.20	10.24	18.15
35-44	54.01	46.16	61.86	14.62	10.50	18.73
45-64	42.63	36.38	48.87	14.87	11.15	18.59
65-74	45.08	33.82	56.33	25.31	17.51	33.10
75-79	85.19	57.49	112.89	55.10	36.18	74.02
80+	254.77	206.02	303.52	209.16	175.89	242.43
Total	57.10	53.05	61.15	27.75	24.97	30.52

Appendix A-4a

Average Annual Mortality Rates per 100,000 and 95% Confidence Intervals,
1987-1998, B.C., by Cause of injury and Gender, Ages 25-34

Cause of Injury	Male			Female			Total		
	Rate	Lower Limit	Upper Limit	Rate	Lower Limit	Upper Limit	Rate	Lower Limit	Upper Limit
Explosives	0.12	0.05	0.28	0.00			0.06	0.00	1.23
Electricity	0.53	0.36	0.80	0.02	0.00	0.17	0.28	0.07	1.13
Other/Unspecified	0.30	0.18	0.52	0.07	0.02	0.22	0.19	0.03	1.03
Late Effects	0.21	0.11	0.40	0.10	0.04	0.26	0.15	0.02	1.01
Motor Vehicle Traffic*	21.44	20.10	22.87	6.91	6.15	7.75	14.28	11.75	17.35
Non - MV Pedal Cycle	0.09	0.03	0.25	0.05	0.01	0.19	0.07	0.00	1.13
Off-Road MV	0.23	0.13	0.43	0.00			0.12	0.01	1.01
Other/Unspecified Transport	2.60	2.16	3.13	0.48	0.31	0.74	1.56	0.86	2.81
Misadventure	0.00			0.02	0.00	0.17	0.01	0.00	10.47
Falls	2.18	1.78	2.67	0.45	0.29	0.71	1.33	0.70	2.52
Environmental	1.00	0.74	1.35	0.17	0.08	0.35	0.59	0.23	1.54
Fire, Flames and Hot Substances	1.18	0.90	1.56	0.38	0.23	0.62	0.79	0.34	1.81
Drowning and Submersion	4.51	3.92	5.19	0.41	0.25	0.65	2.49	1.56	3.97
Poisoning	17.22	16.02	18.50	4.73	4.12	5.44	11.06	8.86	13.81
Adverse Effects	0.12	0.05	0.28	0.05	0.01	0.19	0.08	0.01	1.07
Suffocation	0.81	0.58	1.13	0.14	0.06	0.32	0.48	0.17	1.39
Struck by object	1.21	0.92	1.59	0.05	0.01	0.19	0.64	0.25	1.60
Machinery	1.30	1.00	1.69	0.10	0.04	0.26	0.71	0.29	1.70
Cuting/Piercing	0.14	0.06	0.31	0.05	0.01	0.19	0.09	0.01	1.04
Firearms	0.30	0.18	0.52	0.02	0.00	0.17	0.16	0.03	1.01
Total	55.50	47.79	63.21	14.20	10.24	18.15	35.14	34.78	35.51

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

Appendix A-4b

Average Annual Mortality Rates per 100,000 and 95% Confidence Intervals,
1987-1998, B.C., by Cause of injury and Gender, Ages 35-44

Cause of Injury	Male			Female			Total		
	Rate	Lower Limit	Upper Limit	Rate	Lower Limit	Upper Limit	Rate	Lower Limit	Upper Limit
Explosives	0.17	0.08	0.36	0.03	0.00	0.18	0.10	0.01	1.10
Electricity	0.35	0.21	0.58	0.03	0.00	0.18	0.19	0.03	1.08
Other/Unspecified	0.42	0.26	0.68	0.05	0.01	0.20	0.24	0.05	1.12
Late Effects	0.52	0.34	0.80	0.13	0.05	0.30	0.32	0.09	1.23
Motor Vehicle Traffic*	14.20	13.09	15.41	5.10	4.44	5.85	9.68	7.59	12.35
Non - MV Pedal Cycle	0.07	0.02	0.23	0.05	0.01	0.20	0.06	0.00	1.30
Off-Road MV	0.30	0.17	0.52	0.05	0.01	0.20	0.17	0.03	1.07
Other/Unspecified Transport	2.13	1.72	2.63	0.40	0.25	0.66	1.27	0.65	2.49
Misadventure	0.10	0.04	0.26	0.05	0.01	0.20	0.07	0.00	1.20
Falls	2.60	2.15	3.15	0.63	0.42	0.93	1.62	0.89	2.94
Environmental	0.84	0.60	1.18	0.18	0.08	0.37	0.51	0.18	1.48
Fire, Flames and Hot Substances	0.67	0.46	0.97	0.55	0.36	0.84	0.61	0.23	1.61
Drowning and Submersion	3.39	2.87	4.01	0.30	0.17	0.53	1.86	1.06	3.24
Poisoning	23.90	22.44	25.46	6.48	5.73	7.32	15.25	12.56	18.52
Adverse Effects	0.17	0.08	0.36	0.13	0.05	0.30	0.15	0.02	1.06
Suffocation	0.94	0.68	1.29	0.23	0.12	0.43	0.59	0.22	1.58
Struck by object	1.73	1.37	2.19	0.15	0.07	0.34	0.95	0.43	2.06
Machinery	1.19	0.89	1.58	0.05	0.01	0.20	0.62	0.24	1.63
Cutting/Piercing	0.07	0.02	0.23	0.03	0.00	0.18	0.05	0.00	1.49
Firearms	0.25	0.13	0.46	0.03	0.00	0.18	0.14	0.02	1.06
Total	54.01	46.16	61.86	14.62	10.50	18.73	34.46	34.09	34.83

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

Appendix A-4c

Average Annual Mortality Rates per 100,000 and 95% Confidence Intervals,
1987-1998, B.C., by Cause of injury and Gender, Ages 45-64

Cause of Injury	Male			Female			Total		
	Rate	Lower Limit	Upper Limit	Rate	Lower Limit	Upper Limit	Rate	Lower Limit	Upper Limit
Explosives	0.18	0.09	0.34	0.00			0.09	0.01	0.87
Electricity	0.12	0.05	0.26	0.00			0.06	0.00	0.96
Other/Unspecified	0.42	0.26	0.61	0.10	0.04	0.24	0.26	0.07	0.99
Late Effects	0.46	0.30	0.69	0.22	0.12	0.40	0.34	0.11	1.09
Motor Vehicle Traffic*	12.75	11.80	13.77	6.16	5.51	6.89	9.49	7.61	11.83
Non - MV Pedal Cycle	0.04	0.01	0.16	0.04	0.01	0.16	0.04	0.00	1.19
Off-Road MV	0.20	0.11	0.37	0.02	0.00	0.14	0.11	0.01	0.85
Other/Unspecified Transport	1.69	1.36	2.08	0.18	0.09	0.35	0.94	0.47	1.89
Misadventure	0.08	0.03	0.21	0.20	0.11	0.38	0.14	0.02	0.86
Falls	4.10	3.58	4.70	1.58	1.26	1.97	2.85	1.91	4.26
Environmental	1.11	0.85	1.44	0.36	0.23	0.58	0.74	0.34	1.63
Fire, Flames and Hot Substances	1.45	1.15	1.82	0.71	0.51	0.98	1.08	0.56	2.08
Drowning and Submersion	2.78	2.35	3.28	0.81	0.59	1.10	1.80	1.09	2.99
Poisoning	11.88	10.96	12.87	3.45	2.97	4.01	7.70	6.03	9.84
Adverse Effects	0.44	0.29	0.66	0.42	0.28	0.65	0.43	0.15	1.21
Suffocation	1.51	1.20	1.89	0.53	0.36	0.77	1.02	0.52	2.00
Struck by object	1.72	1.40	2.13	0.02	0.00	0.14	0.88	0.43	1.82
Machinery	1.47	1.17	1.84	0.04	0.01	0.16	0.76	0.35	1.66
Cuting/Piercing	0.10	0.04	0.24	0.00			0.05	0.00	1.04
Firearms	0.16	0.08	0.32	0.02	0.00	0.14	0.09	0.01	0.87
Total	42.63	36.38	48.87	14.87	11.15	18.59	28.88	28.57	29.18

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

Appendix A-4d

Average Annual Mortality Rates per 100,000 and 95% Confidence Intervals,
1987-1998, B.C., by Cause of injury and Gender, Ages 65-74

Cause of Injury	Male			Female			Total		
	Rate	Lower Limit	Upper Limit	Rate	Lower Limit	Upper Limit	Rate	Lower Limit	Upper Limit
Explosives	0.12	0.03	0.49	0.05	0.01	0.37	0.08	0.00	4.25
Electricity	0.06	0.01	0.43	0.00			0.03	0.00	24.96
Other/Unspecified	0.49	0.24	0.98	0.10	0.03	0.42	0.31	0.04	2.39
Late Effects	0.67	0.37	1.21	0.16	0.05	0.48	0.39	0.06	2.41
Motor Vehicle Traffic*	11.83	10.28	13.62	9.32	8.05	10.79	10.48	7.37	14.89
Non - MV Pedal Cycle	0.12	0.03	0.49	0.00			0.06	0.00	6.83
Off-Road MV	0.12	0.03	0.49	0.00			0.06	0.00	6.83
Other/Unspecified Transport	1.10	0.69	1.74	0.26	0.11	0.63	0.65	0.16	2.66
Misadventure	0.31	0.13	0.73	0.26	0.11	0.63	0.28	0.03	2.40
Falls	14.88	13.13	16.87	7.76	6.61	9.11	11.04	7.84	15.55
Environmental	1.10	0.69	1.74	0.10	0.03	0.42	0.56	0.12	2.56
Fire, Flames and Hot Substances	2.68	2.00	3.61	1.09	0.71	1.68	1.83	0.79	4.24
Drowning and Submersion	3.48	2.68	4.51	1.09	0.71	1.68	2.19	1.02	4.73
Poisoning	4.09	3.22	5.19	2.71	2.06	3.55	3.34	1.79	6.23
Adverse Effects	0.85	0.51	1.44	0.63	0.36	1.10	0.73	0.19	2.77
Suffocation	2.01	1.43	2.83	1.51	1.05	2.17	1.74	0.74	4.13
Struck by object	0.31	0.13	0.73	0.16	0.05	0.48	0.23	0.02	2.48
Machinery	0.79	0.46	1.37	0.00			0.37	0.06	2.40
Cutting/Piercing	0.00			0.05	0.01	0.37	0.03	0.00	24.96
Firearms	0.06	0.01	0.43	0.00			0.03	0.00	24.96
Total	45.08	33.82	56.33	25.31	17.51	33.10	34.41	33.86	34.97

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

Appendix A-4e

Average Annual Mortality Rates per 100,000 and 95% Confidence Intervals,
1987-1998, B.C., by Cause of injury and Gender, Ages 75-79

Cause of Injury	Male			Female			Total		
	Rate	Lower Limit	Upper Limit	Rate	Lower Limit	Upper Limit	Rate	Lower Limit	Upper Limit
Explosives	0.00			0.14	0.02	1.00	0.08	0.00	72.75
Electricity	0.20	0.03	1.39	0.00			0.08	0.00	72.75
Other/Unspecified	0.98	0.41	2.35	1.13	0.56	2.25	1.06	0.16	7.00
Late Effects	1.95	1.05	3.63	0.56	0.21	1.50	1.15	0.19	7.04
Motor Vehicle Traffic*	18.76	15.36	22.91	12.54	10.19	15.44	15.15	9.19	24.95
Non - MV Pedal Cycle	0.20	0.03	1.39	0.00			0.08	0.00	72.75
Off-Road MV	0.20	0.03	1.39	0.00			0.08	0.00	72.75
Other/Unspecified Transport	0.78	0.29	2.08	0.00			0.33	0.01	9.76
Misadventure	0.78	0.29	2.08	0.99	0.47	2.07	0.90	0.12	6.98
Falls	41.81	36.57	47.81	29.31	25.59	33.58	34.55	24.83	48.08
Environmental	0.98	0.41	2.35	0.42	0.14	1.31	0.66	0.06	7.22
Fire, Flames and Hot Substances	2.93	1.77	4.86	1.97	1.17	3.33	2.37	0.67	8.38
Drowning and Submersion	2.15	1.19	3.88	0.99	0.47	2.07	1.47	0.30	7.30
Poisoning	4.10	2.68	6.29	1.41	0.76	2.62	2.54	0.75	8.59
Adverse Effects	2.15	1.19	3.88	2.26	1.38	3.68	2.21	0.60	8.17
Suffocation	4.10	2.68	6.29	2.96	1.93	4.54	3.44	1.21	9.80
Struck by object	1.56	0.78	3.13	0.14	0.02	1.00	0.74	0.08	7.08
Machinery	1.37	0.65	2.87	0.28	0.07	1.13	0.74	0.08	7.08
Cutting/Piercing	0.00			0.00			0.00		
Firearms	0.20	0.03	1.39	0.00			0.08	0.00	72.75
Total	85.19	57.49	112.89	55.10	36.18	74.02	67.71	66.39	69.05

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

Appendix A-4f

Average Annual Mortality Rates per 100,000 and 95% Confidence Intervals,
1987-1998, B.C., by Cause of injury and Gender, Ages 80+

Cause of Injury	Male			Female			Total		
	Rate	Lower Limit	Upper Limit	Rate	Lower Limit	Upper Limit	Rate	Lower Limit	Upper Limit
Explosives	0.20	0.03	1.44	0.00			0.07	0.00	65.09
Electricity	0.20	0.03	1.44	0.00			0.07	0.00	65.09
Other/Unspecified	3.85	2.45	6.03	1.61	0.95	2.71	2.49	0.78	7.98
Late Effects	2.43	1.38	4.28	3.10	2.13	4.52	2.86	0.96	8.47
Motor Vehicle Traffic*	31.77	27.17	37.15	13.78	11.52	16.47	20.29	13.49	30.51
Non - MV Pedal Cycle	0.20	0.03	1.44	0.00			0.07	0.00	65.09
Off-Road MV	0.61	0.20	1.88	0.12	0.02	0.82	0.29	0.01	8.73
Other/Unspecified Transport	2.23	1.23	4.02	0.46	0.17	1.22	1.10	0.19	6.34
Misadventure	1.42	0.68	2.97	0.69	0.31	1.53	0.95	0.15	6.26
Falls	181.72	170.22	194.00	168.75	160.34	177.60	173.44	150.86	199.41
Environmental	2.83	1.68	4.78	1.38	0.78	2.43	1.90	0.50	7.21
Fire, Flames and Hot Substances	4.86	3.26	7.25	3.10	2.13	4.52	3.74	1.44	9.67
Drowning and Submersion	3.85	2.45	6.03	1.49	0.87	2.57	2.34	0.71	7.78
Poisoning	1.42	0.68	2.97	2.41	1.57	3.70	2.05	0.57	7.40
Adverse Effects	3.85	2.45	6.03	3.44	2.41	4.93	3.59	1.36	9.47
Suffocation	10.32	7.84	13.58	8.84	7.07	11.05	9.38	5.14	17.09
Struck by object	1.82	0.95	3.50	0.00			0.66	0.07	6.34
Machinery	0.81	0.30	2.16	0.00			0.29	0.01	8.73
* Motor Vehicle Traffic includes MV	0.20	0.03	1.44	0.00			0.07	0.00	65.09
Firearms	0.00			0.00			0.00		
Total	254.77	206.02	303.52	209.16	175.89	242.43	225.67	223.38	227.98

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

Appendix A-4g

Average Annual Mortality Rates per 100,000 and 95% Confidence Intervals,
1987-1998, B.C., by Cause of injury and Gender, Ages 25+

Cause of Injury	Male			Female			Total		
	Rate	Lower Limit	Upper Limit	Rate	Lower Limit	Upper Limit	Rate	Lower Limit	Upper Limit
Explosives	0.15	0.04	0.60	0.02	0.00	0.91	0.08	0.02	0.31
Electricity	0.29	0.11	0.78	0.01	0.00	1.46	0.15	0.06	0.39
Other/Unspecified	0.52	0.25	1.10	0.21	0.07	0.66	0.36	0.20	0.68
Late Effects	0.54	0.26	1.12	0.32	0.13	0.82	0.43	0.24	0.76
Motor Vehicle Traffic*	16.13	14.12	18.44	7.13	5.85	8.69	11.55	10.34	12.90
Non - MV Pedal Cycle	0.08	0.01	0.53	0.04	0.00	0.58	0.06	0.01	0.28
Off-Road MV	0.24	0.08	0.71	0.02	0.00	0.72	0.13	0.05	0.37
Other/Unspecified Transport	1.97	1.35	2.89	0.32	0.13	0.82	1.13	0.80	1.61
Misadventure	0.15	0.04	0.60	0.19	0.06	0.63	0.17	0.07	0.42
Falls	10.99	9.35	12.92	11.73	10.06	13.68	11.36	10.17	12.70
Environmental	1.06	0.63	1.78	0.29	0.11	0.78	0.67	0.42	1.06
Fire, Flames and Hot Substances	1.46	0.94	2.27	0.81	0.45	1.46	1.13	0.79	1.61
Drowning and Submersion	3.48	2.61	4.64	0.66	0.35	1.26	2.05	1.57	2.66
Poisoning	14.97	13.04	17.20	4.27	3.31	5.51	9.53	8.44	10.76
Adverse Effects	0.49	0.23	1.05	0.52	0.25	1.08	0.50	0.30	0.85
Suffocation	1.58	1.03	2.43	1.01	0.60	1.71	1.29	0.93	1.80
Struck by object	1.44	0.92	2.25	0.08	0.01	0.51	0.75	0.48	1.15
Machinery	1.26	0.78	2.03	0.06	0.01	0.52	0.65	0.41	1.03
Cuting/Piercing	0.09	0.02	0.54	0.02	0.00	0.72	0.06	0.01	0.28
Firearms	0.21	0.06	0.67	0.02	0.00	0.91	0.11	0.04	0.34
Total	57.10	53.05	61.15	27.75	24.97	30.52	42.16	39.79	44.67

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

Appendix A-5

Age-Standardized Mortality Rates per 100.000 and 95% Confidence Intervals.
by Year and Gender, B.C., 1987-1998

YEAR	Male			Female		
	Rate	Lower Limit	Upper Limit	Rate	Lower Limit	Upper Limit
1987	59.01	54.51	63.51	28.96	25.84	32.08
1988	53.27	49.06	57.48	27.24	24.28	30.21
1989	51.39	47.33	55.45	27.42	24.48	30.35
1990	60.86	56.51	65.20	28.87	25.91	31.83
1991	55.11	51.04	59.18	31.09	28.07	34.11
1992	54.46	50.46	58.45	26.44	23.70	29.18
1993	65.37	61.06	69.68	29.38	26.53	32.22
1994	60.39	56.31	64.46	26.83	24.17	29.50
1995	55.26	51.42	59.10	26.28	23.69	28.88
1996	57.79	53.92	61.66	26.72	24.14	29.29
1997	57.11	53.31	60.91	27.85	25.26	30.44
1998	54.49	50.80	58.18	26.57	24.07	29.08

Appendix A-6a

Annual Average Age-Specific Mortality Rates per 100,000 and 95% Confidence Intervals.
by Gender and Year, Ages 25-34

Males

YEAR	Leading Causes								
	Motor Vehicle Traffic*			Poisoning*			Drowning and Submersion*		
	Rate	Lower Limit	Upper Limit	Rate	Lower Limit	Upper Limit	Rate	Lower Limit	Upper Limit
1987	26.93	21.83	33.23	5.57	3.51	8.85	6.19	4.00	9.60
1988	22.68	18.09	28.44	6.65	4.38	10.10	6.35	4.14	9.74
1989	21.18	16.81	26.68	7.35	4.97	10.88	4.12	2.44	6.95
1990	34.72	29.05	41.49	8.32	5.78	11.97	4.59	2.81	7.49
1991	25.75	20.97	31.63	13.58	10.24	18.03	5.66	3.65	8.77
1992	18.18	14.26	23.19	17.34	13.52	22.25	7.27	4.95	10.68
1993	23.17	18.71	28.69	28.69	23.67	34.76	3.59	2.08	6.18
1994	19.70	15.66	24.78	26.17	21.45	31.94	4.59	2.85	7.38
1995	19.31	15.35	24.29	21.17	17.00	26.35	3.44	2.00	5.92
1996	16.17	12.61	20.74	22.43	18.16	27.71	4.17	2.56	6.81
1997	15.19	11.74	19.65	20.95	16.83	26.08	2.88	1.60	5.20
1998	16.54	12.89	21.21	24.00	19.52	29.51	1.87	0.89	3.92

Females

YEAR	Leading Causes								
	Motor Vehicle Traffic*			Poisoning*			Other/Unspecified Transport		
	Rate	Lower Limit	Upper Limit	Rate	Lower Limit	Upper Limit	Rate	Lower Limit	Upper Limit
1987	7.47	5.01	11.15	2.18	1.04	4.57	1.25	0.47	3.32
1988	8.55	5.90	12.38	3.36	1.86	6.07	0.31	0.04	2.17
1989	9.55	6.75	13.50	2.39	1.19	4.77	0.30	0.04	2.12
1990	8.22	5.67	11.90	2.64	1.37	5.08	0.88	0.28	2.73
1991	8.76	6.12	12.52	4.09	2.42	6.90	0.00		
1992	6.07	3.95	9.30	2.89	1.55	5.37	0.58	0.14	2.31
1993	8.28	5.75	11.92	8.85	6.23	12.59	0.29	0.04	2.03
1994	7.30	4.97	10.73	6.46	4.29	9.72	0.56	0.14	2.25
1995	6.08	4.01	9.24	4.70	2.92	7.56	0.55	0.14	2.21
1996	5.71	3.72	8.75	7.34	5.03	10.70	0.54	0.14	2.17
1997	3.25	1.84	5.72	5.14	3.28	8.06	0.27	0.04	1.92
1998	4.37	2.68	7.14	6.01	3.96	9.13	0.27	0.04	1.94

* indicates significant trend at $p < 0.05$

Appendix A-6b

Average Annual Age-Specific Mortality Rates per 100,000 and 95% Confidence Intervals.
by Gender and Year, Ages 35-44

Males

YEAR	Leading Causes								
	Poisoning*			Motor Vehicle Traffic*			Drowning and Submersion		
	Rate	Lower Limit	Upper Limit	Rate	Lower Limit	Upper Limit	Rate	Lower Limit	Upper Limit
1987	6.64	4.18	10.54	18.44	13.97	24.33	5.16	3.06	8.72
1988	5.67	3.47	9.25	17.01	12.82	22.57	3.54	1.91	6.59
1989	9.82	6.83	14.14	16.94	12.84	22.35	1.36	0.51	3.61
1990	14.83	11.11	19.80	20.31	15.87	26.00	3.22	1.74	5.99
1991	16.09	12.26	21.12	14.86	11.20	19.71	3.10	1.67	5.75
1992	20.81	16.44	26.35	12.07	8.85	16.45	2.71	1.41	5.22
1993	46.49	39.79	54.30	11.99	8.83	16.28	4.97	3.09	8.00
1994	37.01	31.18	43.92	14.41	10.95	18.96	4.52	2.77	7.38
1995	21.56	17.29	26.88	13.65	10.34	18.00	4.64	2.88	7.46
1996	30.40	25.32	36.50	11.63	8.66	15.63	2.38	1.24	4.57
1997	31.33	26.24	37.42	13.61	10.40	17.82	3.08	1.75	5.43
1998	32.62	27.47	38.74	9.03	6.52	12.52	2.26	1.18	4.34

Females

YEAR	Leading Causes								
	Poisoning*			Motor Vehicle Traffic*			Falls		
	Rate	Lower Limit	Upper Limit	Rate	Lower Limit	Upper Limit	Rate	Lower Limit	Upper Limit
1987	3.85	2.07	7.15	7.31	4.66	11.46	0.39	0.05	2.73
1988	2.20	0.99	4.91	5.14	3.05	8.68	1.10	0.36	3.42
1989	2.09	0.94	4.66	6.98	4.50	10.81	1.05	0.34	3.24
1990	3.30	1.78	6.14	4.96	2.99	8.22	0.33	0.05	2.35
1991	5.99	3.82	9.39	5.04	3.09	8.23	0.63	0.16	2.52
1992	5.80	3.70	9.09	6.10	3.94	9.46	0.00		
1993	10.02	7.16	14.03	6.19	4.04	9.50	0.88	0.29	2.74
1994	8.52	5.96	12.19	4.83	3.00	7.77	1.14	0.43	3.03
1995	6.03	3.97	9.15	4.11	2.48	6.82	1.64	0.74	3.66
1996	7.70	5.35	11.08	3.45	2.00	5.94	0.00		
1997	10.33	7.58	14.09	3.87	2.34	6.43	0.26	0.04	1.83
1998	8.34	5.93	11.74	4.55	2.87	7.22	0.25	0.04	1.80

* indicates significant trend at $p < 0.05$

Appendix A-5c

Average Annual Age-Specific Mortality Rates per 100,000 and 95% Confidence Intervals.
by Gender and Year, Ages 45-64

Males

YEAR	Leading Causes								
	Motor Vehicle Traffic*			Poisoning*			Falls*		
	Rate	Lower Limit	Upper Limit	Rate	Lower Limit	Upper Limit	Rate	Lower Limit	Upper Limit
1987	18.82	14.76	24.01	5.50	3.51	8.63	5.21	3.28	8.27
1988	16.63	12.89	21.47	7.89	5.45	11.43	5.64	3.64	8.74
1989	12.33	9.21	16.52	5.76	3.75	8.83	3.56	2.07	6.14
1990	16.78	13.11	21.49	7.99	5.59	11.43	4.26	2.61	6.96
1991	12.13	9.11	16.14	8.26	5.84	11.68	3.87	2.33	6.42
1992	11.61	8.72	15.45	13.83	10.65	17.98	5.93	3.97	8.85
1993	9.72	7.15	13.20	16.59	13.12	20.97	3.55	2.14	5.90
1994	13.15	10.17	17.01	11.11	8.40	14.70	3.86	2.40	6.20
1995	13.05	10.13	16.80	12.40	9.56	16.07	4.13	2.64	6.48
1996	13.81	10.85	17.58	12.76	9.93	16.40	3.77	2.37	5.98
1997	8.86	6.59	11.91	16.31	13.12	20.28	3.02	1.82	5.01
1998	9.34	7.04	12.39	18.48	15.12	22.60	3.31	2.06	5.32

Females

YEAR	Leading Causes								
	Motor Vehicle Traffic*			Poisoning			Falls		
	Rate	Lower Limit	Upper Limit	Rate	Lower Limit	Upper Limit	Rate	Lower Limit	Upper Limit
1987	9.67	6.88	13.61	2.64	1.37	5.07	1.47	0.61	3.52
1988	7.19	4.86	10.64	3.74	2.17	6.44	1.73	0.78	3.84
1989	7.32	4.98	10.75	2.82	1.51	5.23	1.69	0.76	3.76
1990	9.35	6.68	13.08	3.57	2.07	6.15	1.10	0.41	2.93
1991	7.49	5.17	10.85	4.01	2.42	6.66	1.07	0.40	2.85
1992	4.85	3.09	7.60	2.04	1.02	4.08	1.79	0.85	3.75
1993	6.33	4.31	9.30	5.11	3.33	7.84	1.95	0.97	3.89
1994	7.40	5.23	10.46	2.54	1.41	4.59	2.78	1.58	4.89
1995	3.96	2.50	6.29	2.20	1.18	4.09	1.54	0.74	3.23
1996	5.28	3.57	7.82	2.75	1.59	4.73	1.27	0.57	2.82
1997	5.67	3.92	8.22	4.05	2.61	6.28	1.62	0.81	3.24
1998	2.15	1.19	3.88	5.46	3.77	7.91	0.98	0.41	2.34

* indicates significant trend at $p < 0.05$

Appendix A-6d

Average Annual Age-Specific Mortality Rates per 100.000 and 95% Confidence Intervals.
by Gender and Year, Ages 65-74

Males

YEAR	Leading Causes								
	Falls			Motor Vehicle Traffic*			Poisoning		
	Rate	Lower Limit	Upper Limit	Rate	Lower Limit	Upper Limit	Rate	Lower Limit	Upper Limit
1987	16.73	10.80	25.94	18.41	12.12	27.96	5.02	2.26	11.17
1988	11.44	6.77	19.32	16.34	10.54	25.33	1.63	0.41	6.53
1989	13.56	8.43	21.81	15.15	9.66	23.75	3.99	1.66	9.58
1990	24.22	17.04	34.45	10.94	6.48	18.47	3.91	1.63	9.39
1991	18.20	12.20	27.15	14.41	9.19	22.59	3.79	1.58	9.11
1992	14.08	8.98	22.07	5.93	2.96	11.85	2.22	0.72	6.89
1993	11.55	7.07	18.85	11.55	7.07	18.85	6.50	3.38	12.48
1994	10.52	6.34	17.45	12.62	7.95	20.03	2.81	1.05	7.47
1995	13.07	8.34	20.50	8.94	5.19	15.40	5.50	2.75	11.01
1996	16.84	11.38	24.92	6.74	3.62	12.52	2.69	1.01	7.18
1997	15.31	10.18	23.04	12.65	8.07	19.83	4.66	2.22	9.78
1998	13.80	9.00	21.16	10.51	6.44	17.16	5.91	3.08	11.37

Females

YEAR	Leading Causes								
	Motor Vehicle traffic			Falls			Poisoning		
	Rate	Lower Limit	Upper Limit	Rate	Lower Limit	Upper Limit	Rate	Lower Limit	Upper Limit
1987	9.49	5.62	16.02	10.84	6.64	17.70	4.74	2.26	9.95
1988	12.60	8.04	19.76	3.98	1.79	8.86	5.31	2.65	10.61
1989	7.82	4.44	13.77	3.91	1.76	8.71	2.61	0.98	6.95
1990	10.28	6.30	16.78	10.92	6.79	17.57	2.57	0.96	6.85
1991	11.97	7.64	18.77	10.71	6.66	17.23	2.52	0.95	6.72
1992	11.84	7.55	18.56	4.99	2.49	9.97	4.36	2.08	9.15
1993	5.53	2.88	10.64	6.15	3.31	11.43	1.84	0.60	5.72
1994	12.10	7.81	18.76	7.87	4.57	13.55	0.61	0.09	4.30
1995	9.01	5.43	14.95	5.41	2.81	10.39	2.40	0.90	6.40
1996	6.59	3.65	11.90	7.79	4.52	13.41	1.80	0.58	5.57
1997	5.41	2.82	10.40	12.03	7.76	18.64	1.80	0.58	5.59
1998	9.62	5.89	15.70	8.42	4.98	14.21	2.40	0.90	6.41

* indicates significant trend at $p < 0.05$

Appendix A-6e

Average Annual Age-Specific Mortality Rates per 100,000
and 95% Confidence Intervals, by Gender and Year, Ages 75-79

Males

YEAR	Leading Causes					
	Falls			Motor Vehicle Traffic		
	Rate	Lower Limit	Upper Limit	Rate	Lower Limit	Upper Limit
1987	47.89	29.77	77.03	14.08	5.86	33.84
1988	34.95	20.29	60.19	26.88	14.46	49.96
1989	61.50	41.22	91.75	23.06	12.00	44.32
1990	38.96	23.87	63.60	26.79	14.83	48.37
1991	35.45	21.37	58.81	21.27	11.07	40.88
1992	28.04	15.92	49.37	16.35	7.80	34.31
1993	42.21	26.59	67.00	14.07	6.32	31.32
1994	47.03	30.34	72.89	28.21	16.02	49.68
1995	41.12	25.91	65.27	11.42	4.75	27.44
1996	43.73	28.21	67.78	15.30	7.30	32.10
1997	47.40	31.50	71.34	12.37	5.56	27.53
1998	35.49	22.36	56.34	17.75	9.23	34.11

Females

YEAR	Leading Causes					
	Falls*			Motor Vehicle Traffic*		
	Rate	Lower Limit	Upper Limit	Rate	Lower Limit	Upper Limit
1987	20.39	10.97	37.89	12.23	5.50	27.23
1988	23.44	13.31	41.28	27.35	16.20	46.18
1989	24.10	14.00	41.51	16.69	8.68	32.07
1990	21.24	12.06	37.40	14.16	7.08	28.31
1991	43.14	29.15	63.84	12.08	5.76	25.34
1992	23.67	14.02	39.96	18.60	10.30	33.58
1993	28.58	17.77	45.97	5.04	1.63	15.64
1994	16.75	9.01	31.13	6.70	2.51	17.85
1995	32.49	20.96	50.36	8.12	3.38	19.52
1996	43.62	30.12	63.17	12.46	6.23	24.92
1997	38.67	26.33	56.79	10.41	4.96	21.84
1998	30.17	19.67	46.27	10.06	4.79	21.09

* indicates significant trend at $p < 0.05$

Appendix A-6f

Average Annual Age-Specific Mortality Rates per 100.000 and 95% Confidence Intervals.
by Gender and Year, Ages 80+

Males

YEAR	Leading Causes								
	Falls*			Motor Vehicle Traffic			Suffocation		
	Rate	Lower Limit	Upper Limit	Rate	Lower Limit	Upper Limit	Rate	Lower Limit	Upper Limit
1987	228.35	182.10	286.34	48.71	29.84	79.52	15.22	6.34	36.57
1988	205.13	162.29	259.29	38.10	22.12	65.61	5.86	1.47	23.44
1989	171.97	133.80	221.02	28.19	15.17	52.40	2.82	0.40	20.01
1990	189.48	149.91	239.50	43.31	26.53	70.70	10.83	4.06	28.85
1991	159.31	123.95	204.75	39.17	23.62	64.98	15.67	7.04	34.88
1992	199.56	160.29	248.45	17.46	8.32	36.63	19.96	9.98	39.90
1993	179.88	143.45	225.57	23.98	12.90	44.58	7.20	2.32	22.31
1994	176.12	140.86	220.19	20.59	10.71	39.56	4.57	1.14	18.29
1995	168.67	134.91	210.89	35.05	21.47	57.21	15.33	7.31	32.16
1996	208.29	170.87	253.89	34.01	20.83	55.51	12.75	5.73	28.39
1997	154.37	123.10	193.58	18.52	9.64	35.60	6.17	1.99	19.15
1998	158.95	127.50	198.17	40.24	25.96	62.37	8.05	3.02	21.44

Females

YEAR	Leading Causes								
	Falls*			Motor Vehicle Traffic			Suffocation		
	Rate	Lower Limit	Upper Limit	Rate	Lower Limit	Upper Limit	Rate	Lower Limit	Upper Limit
1987	182.56	150.77	221.04	10.43	4.69	23.22	8.69	3.62	20.89
1988	134.33	107.90	167.24	28.55	17.75	45.92	5.04	1.62	15.62
1989	174.16	144.23	210.31	14.51	7.55	27.89	4.84	1.56	15.00
1990	173.72	144.35	209.07	13.96	7.26	26.83	12.41	6.21	24.81
1991	184.50	154.72	220.01	10.42	4.97	21.85	22.32	13.45	37.02
1992	179.03	150.34	213.18	14.21	7.64	26.41	17.05	9.68	30.02
1993	161.32	134.69	193.22	9.57	4.56	20.07	10.94	5.47	21.87
1994	158.44	132.67	189.20	18.18	10.77	30.70	5.19	1.95	13.84
1995	154.81	129.91	184.47	17.34	10.27	29.28	12.38	6.66	23.02
1996	171.64	145.69	202.21	8.40	4.01	17.62	7.20	3.24	16.03
1997	170.86	145.44	200.73	5.77	2.40	13.87	2.31	0.58	9.23
1998	178.37	152.70	208.37	16.83	10.14	27.91	1.12	0.16	7.96

* indicates significant trend at $p < 0.05$

Appendix A-7

Standardized Mortality Ratios and 95% Confidence Intervals.
1987-1998, B.C., by Health Region and Gender, Ages 25+

Health Region	Male			Female		
	Rate	Lower Limit	Upper Limit	Rate	Lower Limit	Upper Limit
East Kootenay	0.97	0.57	1.66	1.05	0.49	2.24
West Kootenay - Boundary	1.33	0.86	2.06	1.35	0.73	2.48
North Okanagan	1.31	0.90	1.92	1.46	0.88	2.42
South Okanagan - Similkameen	1.05	0.77	1.41	1.14	0.78	1.67
Thompson	1.78	1.29	2.45	1.74	1.06	2.83
Fraser Valley	1.08	0.80	1.47	1.17	0.77	1.77
South Fraser Valley	0.88	0.70	1.10	0.94	0.69	1.29
Simon Fraser	0.90	0.66	1.21	0.91	0.59	1.39
Coast Garibaldi	1.32	0.81	2.13	1.22	0.57	2.57
Central Vancouver Island	1.21	0.91	1.60	1.27	0.87	1.88
Upper Island / Central Coast	1.50	1.05	2.17	1.28	0.69	2.36
Cariboo	1.87	1.23	2.84	1.89	0.96	3.75
North West	1.91	1.31	2.78	1.59	0.78	3.23
Peace Liard	1.65	1.02	2.66	1.38	0.57	3.33
Northern Interior	1.72	1.23	2.40	1.83	1.05	3.19
Vancouver	0.74	0.63	0.86	0.66	0.52	0.82
Burnaby	0.84	0.58	1.21	0.99	0.63	1.57
North Shore	0.69	0.46	1.05	0.98	0.61	1.56
Richmond	0.66	0.41	1.08	0.76	0.40	1.45
Capital	0.94	0.73	1.21	1.10	0.82	1.47

Appendix A-8a

Standardized Mortality Ratios and 95% Confidence Intervals.
1987-1998, B.C., by Health Region and Gender, Ages 25-44

Health Region	Male			Female		
	Rate	Lower Limit	Upper Limit	Rate	Lower Limit	Upper Limit
East Kootenay	0.90	0.40	2.01	0.74	0.13	4.25
West Kootenay - Boundary	1.55	0.83	2.90	0.96	0.20	4.55
North Okanagan	1.38	0.77	2.48	1.59	0.56	4.54
South Okanagan - Similkameen	0.97	0.58	1.63	0.96	0.36	2.58
Thompson	1.92	1.24	2.98	1.95	0.84	4.52
Fraser Valley	1.20	0.78	1.84	1.33	0.59	2.97
South Fraser Valley	0.92	0.68	1.26	0.79	0.41	1.51
Simon Fraser	0.81	0.53	1.23	0.73	0.31	1.74
Coast Garibaldi	1.42	0.73	2.75	1.29	0.32	5.17
Central Vancouver Island	1.24	0.81	1.90	1.20	0.52	2.77
Upper Island / Central Coast	1.71	1.06	2.75	1.37	0.48	3.90
Cariboo	1.74	0.96	3.17	2.37	0.87	6.46
North West	1.99	1.24	3.18	1.80	0.66	4.91
Peace Liard	1.36	0.69	2.68	1.67	0.48	5.78
Northern Interior	1.58	1.01	2.48	1.83	0.80	4.20
Vancouver	0.75	0.61	0.93	0.87	0.58	1.29
Burnaby	0.80	0.47	1.36	0.70	0.22	2.16
North Shore	0.55	0.28	1.11	0.67	0.21	2.19
Richmond	0.56	0.27	1.18	0.47	0.10	2.14
Capital	0.88	0.59	1.32	0.72	0.31	1.70

Appendix A-8b

Standardized Mortality Ratios and 95% Confidence Intervals.
1987-1998, B.C., by Health Region and Gender, Ages 45-64

Health Region	Male			Female		
	Rate	Lower Limit	Upper Limit	Rate	Lower Limit	Upper Limit
East Kootenay	1.16	0.44	3.03	1.15	0.21	6.26
West Kootenay - Boundary	1.30	0.54	3.14	1.44	0.34	6.11
North Okanagan	1.27	0.58	2.76	1.46	0.43	4.95
South Okanagan - Similkameen	0.91	0.46	1.79	1.02	0.36	2.90
Thompson	1.63	0.87	3.09	1.56	0.50	4.85
Fraser Valley	1.07	0.56	2.07	1.37	0.51	3.64
South Fraser Valley	0.80	0.49	1.29	1.08	0.53	2.18
Simon Fraser	0.76	0.39	1.47	1.00	0.37	2.68
Coast Garibaldi	1.17	0.42	3.25	1.08	0.16	7.12
Central Vancouver Island	1.12	0.62	2.00	1.14	0.43	3.05
Upper Island / Central Coast	1.33	0.63	2.81	1.59	0.47	5.39
Cariboo	1.97	0.92	4.23	1.87	0.45	7.72
North West	1.90	0.91	3.99	1.35	0.26	6.99
Peace Liard	2.21	0.94	5.19	1.48	0.23	9.74
Northern Interior	1.82	0.96	3.44	1.71	0.52	5.68
Vancouver	0.83	0.60	1.14	0.73	0.41	1.30
Burnaby	0.80	0.37	1.76	0.65	0.15	2.77
North Shore	0.61	0.26	1.43	0.72	0.19	2.65
Richmond	0.54	0.19	1.54	0.57	0.10	3.11
Capital	0.93	0.53	1.61	0.72	0.26	1.99

Appendix A-8c

Standardized Mortality Ratios and 95% Confidence Intervals.
1987-1998, B.C., by Health Region and Gender, Ages 65-79

Health Region	Male			Female		
	Rate	Lower Limit	Upper Limit	Rate	Lower Limit	Upper Limit
East Kootenay	0.96	0.22	4.06	1.29	0.28	5.87
West Kootenay - Boundary	1.03	0.30	3.54	1.84	0.60	5.61
North Okanagan	1.39	0.58	3.38	1.26	0.41	3.90
South Okanagan - Similkameen	1.26	0.68	2.32	1.27	0.61	2.63
Thompson	1.43	0.53	3.84	2.30	0.87	6.06
Fraser Valley	1.04	0.47	2.29	1.16	0.48	2.83
South Fraser Valley	0.86	0.45	1.63	0.99	0.49	1.98
Simon Fraser	1.28	0.59	2.78	1.03	0.39	2.68
Coast Garibaldi	1.23	0.32	4.64	0.87	0.12	6.14
Central Vancouver Island	1.15	0.58	2.28	1.12	0.48	2.61
Upper Island / Central Coast	1.16	0.35	3.84	1.15	0.26	5.04
Cariboo	2.59	0.90	7.48	2.04	0.41	10.10
North West	1.77	0.43	7.27	1.16	0.12	11.12
Peace Liard	1.92	0.40	9.12	0.82	0.04	17.18
Northern Interior	1.96	0.64	5.98	2.55	0.72	8.98
Vancouver	0.67	0.42	1.08	0.60	0.35	1.05
Burnaby	0.76	0.26	2.20	0.99	0.35	2.79
North Shore	0.76	0.26	2.23	1.00	0.35	2.84
Richmond	0.82	0.23	2.96	0.62	0.12	3.23
Capital	0.94	0.51	1.73	0.94	0.48	1.85

Appendix A-8d

Standardized Mortality Ratios and 95% Confidence Intervals.
1987-1998, B.C., by Health Region and Gender, Ages 80+

Health Region	Male			Female		
	Rate	Lower Limit	Upper Limit	Rate	Lower Limit	Upper Limit
East Kootenay	0.89	0.20	4.06	1.10	0.31	3.88
West Kootenay - Boundary	1.12	0.36	3.49	1.26	0.47	3.38
North Okanagan	1.15	0.43	3.05	1.50	0.68	3.35
South Okanagan - Similkameen	1.11	0.59	2.10	1.19	0.67	2.11
Thompson	1.91	0.74	4.94	1.28	0.45	3.65
Fraser Valley	0.81	0.34	1.97	1.01	0.49	2.06
South Fraser Valley	0.89	0.47	1.69	0.97	0.57	1.64
Simon Fraser	1.29	0.59	2.83	0.95	0.47	1.94
Coast Garibaldi	1.34	0.33	5.34	1.43	0.44	4.67
Central Vancouver Island	1.37	0.69	2.74	1.49	0.82	2.69
Upper Island / Central Coast	1.34	0.39	4.62	1.05	0.30	3.69
Cariboo	1.33	0.23	7.65	1.02	0.14	7.22
North West	1.36	0.22	8.36	1.69	0.37	7.69
Peace Liard	1.94	0.41	9.21	1.08	0.14	8.39
Northern Interior	2.32	0.70	7.70	1.46	0.34	6.21
Vancouver	0.60	0.38	0.94	0.54	0.37	0.78
Burnaby	1.11	0.48	2.60	1.28	0.69	2.39
North Shore	1.27	0.54	2.99	1.26	0.66	2.41
Richmond	1.26	0.43	3.70	1.21	0.49	2.97
Capital	1.08	0.64	1.84	1.39	0.96	2.01

APPENDIX B Hospital Separations

Appendix B-1

Average Annual Age-Specific Hospital Separation Rates per 100.000 and
95% Confidence Intervals, by Gender and Age Group, B.C., 1987-1998

Age group	Male			Female		
	Rate	Lower Limit	Upper Limit	Rate	Lower Limit	Upper Limit
25-34	1104.90	1070.50	1139.30	557.32	532.54	582.10
35-44	979.57	946.15	1013.00	560.89	535.40	586.37
45-64	1044.90	1013.99	1075.80	843.01	814.99	871.03
65-74	1716.86	1647.38	1786.34	1863.43	1796.55	1930.31
75-79	2713.25	2556.93	2869.58	3328.56	3181.51	3475.61
80+	4627.59	4419.81	4835.36	6154.43	5973.96	6334.89
Total	1276.90	1257.74	1296.06	1205.94	1187.65	1224.23

Appendix B-2a

Average Annual Hospital Separation Rates per 100.000 and 95% Confidence Intervals.
1987-1998, B.C.. by Cause of Injury and Gender. Ages 25-34

Cause of Injury	Male			Female			Total		
	Rate	Lower Limit	Upper Limit	Rate	Lower Limit	Upper Limit	Rate	Lower Limit	Upper Limit
Explosives	6.90	4.65	10.23	0.84	0.27	2.64	3.91	2.69	5.68
Electricity	3.79	2.23	6.45	0.14	0.01	2.29	1.99	1.18	3.36
Overexertion	76.32	67.79	85.92	30.45	25.17	36.82	53.71	48.57	59.39
Other/Unspecified	14.68	11.21	19.24	8.08	5.58	11.69	11.43	9.19	14.21
Late Effects	73.32	64.98	82.74	32.26	26.82	38.81	53.08	47.98	58.73
Motor Vehicle Traffic	248.03	232.26	264.88	118.72	107.82	130.73	184.29	174.55	194.57
Non - MV Pedal Cycle	21.10	16.84	26.43	8.17	5.66	11.80	14.73	12.15	17.84
Off-Road Vehicle	23.02	18.56	28.57	3.25	1.82	5.82	13.28	10.85	16.25
Other/Unspecified Transport	25.14	20.45	30.90	16.49	12.73	21.35	20.87	17.77	24.53
Misadventure	7.62	5.24	11.09	40.77	34.59	48.05	23.96	20.61	27.85
Falls	222.43	207.52	238.41	115.59	104.84	127.44	169.76	160.43	179.64
Environmental	16.19	12.52	20.94	9.34	6.63	13.17	12.82	10.43	15.75
Fire, Flames and Hot Substances	21.63	17.31	27.02	6.52	4.33	9.84	14.18	11.66	17.25
Machinery	49.35	42.59	57.18	2.65	1.39	5.05	26.33	22.81	30.40
Drowning and Submersion	3.18	1.78	5.69	0.69	0.20	2.45	1.96	1.15	3.31
Poisoning	28.72	23.67	34.83	21.44	17.09	26.89	25.13	21.69	29.11
Adverse Effects	46.65	40.09	54.28	96.83	87.03	107.73	71.39	65.43	77.89
Suffocation	1.93	0.92	4.06	0.88	0.29	2.70	1.41	0.76	2.63
Foreign Body	9.06	6.43	12.78	3.25	1.82	5.82	6.20	4.61	8.33
Struck by Object	133.87	122.41	146.39	23.61	19.02	29.30	79.52	73.21	86.37
Cutting/Piercing	68.40	60.35	77.51	16.80	13.00	21.70	42.96	38.39	48.07
Firearms	3.58	2.07	6.18	0.55	0.13	2.26	2.09	1.25	3.47
Total	1104.90	1070.50	1139.30	557.32	532.54	582.10	834.97	813.95	856.54

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

Appendix B-2b

Average Annual Hospital Separation Rates per 100,000 and 95% Confidence Intervals.
1987-1998, B.C.. by Cause of Injury and Gender, Ages 35-44

Cause of Injury	Male			Female			Total		
	Rate	Lower Limit	Upper Limit	Rate	Lower Limit	Upper Limit	Rate	Lower Limit	Upper Limit
Explosives	5.29	3.33	8.42	0.65	0.17	2.47	2.99	1.93	4.64
Electricity	3.04	1.65	5.61	0.10	0.00	2.99	1.58	0.87	2.89
Overexertion	67.05	58.85	76.39	29.43	24.14	35.89	48.38	43.39	53.95
Other/Unspecified	15.66	11.96	20.51	9.39	6.61	13.34	12.55	10.13	15.54
Late Effects	74.62	65.94	84.44	29.78	24.45	36.27	52.37	47.16	58.15
Motor Vehicle Traffic	168.58	155.27	183.03	86.66	77.20	97.28	127.93	119.64	136.80
Non - MV Pedal Cycle	16.97	13.10	21.99	6.91	4.59	10.40	11.98	9.62	14.91
Off-Road Vehicle	13.58	10.17	18.15	2.24	1.09	4.59	7.95	6.08	10.40
Other/Unspecified Transport	24.07	19.36	29.93	16.02	12.25	20.96	20.08	16.95	23.78
Misadventure	14.20	10.70	18.85	42.54	36.07	50.17	28.27	24.51	32.60
Falls	240.06	224.07	257.19	147.54	135.03	161.20	194.14	183.86	205.00
Environmental	14.62	11.06	19.33	10.52	7.55	14.66	12.59	10.17	15.59
Fire, Flames and Hot Substances	16.75	12.90	21.74	6.38	4.17	9.77	11.60	9.29	14.49
Machinery	43.82	37.29	51.49	2.49	1.26	4.92	23.31	19.92	27.27
Drowning and Submersion	2.60	1.34	5.04	0.60	0.15	2.41	1.61	0.88	2.92
Poisoning	29.22	23.98	35.60	23.81	19.10	29.68	26.53	22.90	30.74
Adverse Effects	70.26	61.86	79.81	112.43	101.58	124.44	91.19	84.23	98.72
Suffocation	2.45	1.24	4.85	1.53	0.64	3.65	1.99	1.17	3.41
Foreign Body	9.18	6.45	13.06	3.92	2.28	6.75	6.57	4.89	8.83
Struck by Object	100.79	90.62	112.11	15.02	11.38	19.82	58.23	52.72	64.31
Cutting/Piercing	44.48	37.90	52.21	12.56	9.27	17.01	28.64	24.86	33.00
Firearms	2.28	1.12	4.62	0.38	0.07	2.17	1.33	0.69	2.57
Total	979.57	946.15	1013.00	560.89	535.40	586.37	771.79	751.02	793.14

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

Appendix B-2c

Average Annual Hospital Separation Rates per 100.000 and 95% Confidence Intervals.
1987-1998, B.C., by Cause of Injury and Gender, Ages 45-64

Cause of Injury	Male			Female			Total		
	Rate	Lower Limit	Upper Limit	Rate	Lower Limit	Upper Limit	Rate	Lower Limit	Upper Limit
Explosives	4.44	2.82	6.99	0.53	0.14	1.99	2.50	1.63	3.84
Electricity	2.04	1.05	3.99	0.04	0.00	4.91	1.05	0.54	2.04
Overexertion	46.43	40.36	53.43	27.17	22.58	32.69	36.89	32.99	41.26
Other/Unspecified	17.31	13.76	21.78	12.08	9.15	15.95	14.72	12.33	17.57
Late Effects	62.59	55.47	70.63	28.64	23.92	34.30	45.78	41.40	50.61
Motor Vehicle Traffic	125.94	115.65	137.13	92.25	83.44	102.00	109.25	102.38	116.59
Non - MV Pedal Cycle	10.21	7.57	13.77	7.53	5.30	10.71	8.89	7.08	11.16
Off-Road Vehicle	8.76	6.35	12.10	1.82	0.89	3.72	5.32	3.97	7.15
Other/Unspecified Transport	20.56	16.65	25.39	10.22	7.56	13.82	15.44	12.99	18.35
Misadventure	47.23	41.09	54.28	49.51	43.17	56.79	48.36	43.86	53.32
Falls	320.09	303.44	337.66	323.48	306.58	341.31	321.77	309.82	334.19
Environmental	15.56	12.21	19.83	10.63	7.90	14.29	13.12	10.87	15.82
Fire, Flames and Hot Substances	15.86	12.48	20.16	7.19	5.02	10.31	11.57	9.47	14.12
Machinery	38.88	33.35	45.32	2.24	1.18	4.27	20.73	17.86	24.07
Drowning and Submersion	2.34	1.25	4.37	0.73	0.23	2.25	1.54	0.89	2.66
Poisoning	25.26	20.88	30.55	21.76	17.69	26.76	23.52	20.45	27.06
Adverse Effects	169.06	157.07	181.96	216.83	203.07	231.51	192.72	183.52	202.38
Suffocation	5.16	3.38	7.85	3.51	2.10	5.88	4.34	3.13	6.02
Foreign Body	11.52	8.69	15.27	6.36	4.34	9.33	8.97	7.15	11.25
Struck by Object	61.78	54.70	69.77	12.20	9.26	16.08	37.22	33.30	41.60
Cutting/Piercing	32.63	27.60	38.58	8.10	5.77	11.37	20.48	17.63	23.80
Firearms	1.25	0.53	2.94	0.18	0.02	1.75	0.72	0.32	1.60
Total	1044.90	1013.99	1075.80	843.01	814.99	871.03	944.89	924.25	966.00

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

Appendix B-2d

Average Annual Hospital Separation Rates per 100,000 and 95% Confidence Intervals.
1987-1998, B.C., by Cause of Injury and Gender, Ages 65-74

Cause of Injury	Male			Female			Total		
	Rate	Lower Limit	Upper Limit	Rate	Lower Limit	Upper Limit	Rate	Lower Limit	Upper Limit
Explosives	1.65	0.45	6.08	0.21	0.01	6.21	0.87	0.26	2.95
Electricity	0.06	0.00	54.20	0.00			0.03	0.00	24.96
Overexertion	33.91	25.43	45.23	34.11	26.16	44.47	34.02	27.99	41.35
Other/Unspecified	24.03	17.07	33.83	21.35	15.27	29.85	22.58	17.78	28.69
Late Effects	46.36	36.24	59.30	30.04	22.65	39.86	37.56	31.19	45.22
Motor Vehicle Traffic	130.17	112.37	150.77	125.49	109.28	144.10	127.64	115.41	141.17
Non - MV Pedal Cycle	9.76	5.71	16.69	5.42	2.78	10.54	7.42	4.88	11.26
Off-Road Vehicle	5.67	2.81	11.47	1.09	0.25	4.81	3.20	1.70	6.05
Other/Unspecified Transport	12.14	7.50	19.64	6.46	3.51	11.88	9.07	6.22	13.24
Misadventure	128.27	110.62	148.74	88.88	75.41	104.76	107.02	95.88	119.47
Falls	622.77	582.30	666.05	927.00	881.01	975.39	786.89	755.61	819.47
Environmental	15.19	9.88	23.35	9.79	5.97	16.06	12.28	8.87	16.99
Fire, Flames and Hot Substances	16.29	10.75	24.68	10.00	6.12	16.32	12.89	9.39	17.70
Machinery	23.73	16.82	33.48	0.94	0.19	4.64	11.43	8.17	16.01
Drowning and Submersion	2.81	1.03	7.64	0.99	0.21	4.70	1.83	0.79	4.24
Poisoning	37.39	28.42	49.19	37.33	28.97	48.11	37.36	31.01	45.01
Adverse Effects	526.03	488.94	565.93	525.02	490.70	561.75	525.49	500.04	552.23
Suffocation	12.50	7.78	20.09	8.02	4.64	13.86	10.08	7.05	14.43
Foreign Body	17.57	11.77	26.21	11.14	7.01	17.72	14.10	10.41	19.09
Struck by Object	27.75	20.19	38.15	13.49	8.84	20.56	20.06	15.56	25.86
Cutting/Piercing	22.32	15.65	31.84	6.51	3.55	11.95	13.79	10.15	18.74
Firearms	0.49	0.04	5.38	0.16	0.00	7.87	0.31	0.04	2.39
Total	1716.86	1647.38	1786.34	1863.43	1796.55	1930.31	1795.93	1748.35	1844.81

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

Appendix B-2e

Average Annual Hospital Separation Rates per 100,000 and 95% Confidence Intervals.
1987-1998, B.C.. by Cause of Injury and Gender, Ages 75-79

Cause of Injury	Male			Female			Total		
	Rate	Lower Limit	Upper Limit	Rate	Lower Limit	Upper Limit	Rate	Lower Limit	Upper Limit
Explosives	1.17	0.07	18.74	0.56	0.02	16.80	0.82	0.10	7.01
Electricity	0.98	0.05	20.35	0.00			0.41	0.02	8.53
Overexertion	37.12	22.68	60.75	47.63	32.92	68.91	43.23	32.17	58.09
Other/Unspecified	43.57	27.65	68.65	35.80	23.38	54.81	39.05	28.62	53.29
Late Effects	48.45	31.48	74.57	46.51	32.00	67.58	47.32	35.68	62.76
Motor Vehicle Traffic	177.41	141.62	222.24	156.01	127.21	191.32	164.97	141.82	191.91
Non - MV Pedal Cycle	10.36	4.07	26.31	3.66	0.97	13.88	6.47	3.01	13.88
Off-Road Vehicle	7.23	2.37	22.07	1.13	0.10	12.43	3.68	1.34	10.14
Other/Unspecified Transport	10.36	4.07	26.31	7.19	2.78	18.60	8.51	4.38	16.57
Misadventure	157.48	123.98	200.02	111.05	87.19	141.44	130.51	110.10	154.70
Falls	1159.00	1061.20	1265.81	1955.51	1845.98	2071.53	1621.74	1545.36	1701.89
Environmental	20.71	10.71	40.05	13.25	6.58	26.68	16.37	10.13	26.47
Fire, Flames and Hot Substances	20.71	10.71	40.05	16.49	8.80	30.89	18.26	11.59	28.77
Machinery	16.41	7.82	34.43	1.55	0.20	12.01	7.78	3.88	15.61
Drowning and Submersion	2.54	0.39	16.70	0.70	0.03	14.68	1.47	0.30	7.30
Poisoning	56.07	37.56	83.72	62.99	45.69	86.85	60.09	46.77	77.21
Adverse Effects	854.79	771.40	947.20	811.60	742.14	887.56	829.70	775.58	887.59
Suffocation	21.49	11.25	41.06	12.40	6.01	25.57	16.21	10.01	26.26
Foreign Body	22.86	12.20	42.82	13.95	7.05	27.60	17.68	11.14	28.07
Struck by Object	25.79	14.28	46.57	23.96	14.23	40.33	24.73	16.73	36.54
Cutting/Piercing	17.19	8.34	35.46	6.48	2.38	17.64	10.97	6.10	19.72
Firearms	1.56	0.14	17.24	0.14	0.00	125.23	0.74	0.08	7.08
Total	2713.25	2556.93	2869.58	3328.56	3181.51	3475.61	3070.72	2964.93	3180.29

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

Appendix B-2f

Average Annual Hospital Separation Rates per 100,000 and 95% Confidence Intervals.
1987-1998. B.C.. by Cause of Injury and Gender. Ages 80+

Cause of Injury	Male			Female			Total		
	Rate	Lower Limit	Upper Limit	Rate	Lower Limit	Upper Limit	Rate	Lower Limit	Upper Limit
Explosives	1.82	0.19	17.51	0.23	0.00	27.93	0.81	0.10	6.24
Electricity	0.40	0.00	49.23	0.11	0.00	102.01	0.22	0.00	11.07
Overexertion	43.10	27.07	68.64	62.10	46.38	83.16	55.23	43.13	70.72
Other/Unspecified	51.40	33.57	78.70	53.61	39.16	73.40	52.81	41.01	68.00
Late Effects	56.46	37.60	84.77	61.87	46.19	82.89	59.91	47.25	75.97
Motor Vehicle Traffic	199.33	160.55	247.47	137.30	112.82	167.08	159.75	138.13	184.75
Non - MV Pedal Cycle	11.53	4.69	28.35	2.30	0.50	10.48	5.64	2.60	12.23
Off-Road Vehicle	6.48	1.95	21.50	3.33	0.94	11.75	4.47	1.87	10.66
Other/Unspecified Transport	9.31	3.42	25.33	8.49	3.86	18.70	8.79	4.73	16.34
Misadventure	135.99	104.65	176.70	85.87	66.99	110.06	104.01	86.86	124.54
Falls	2769.91	2613.74	2935.42	4526.74	4374.58	4684.19	3890.85	3777.90	4007.17
Environmental	26.91	14.94	48.49	18.94	11.16	32.13	21.83	14.73	32.35
Fire, Flames and Hot Substances	30.96	17.88	53.61	24.34	15.27	38.80	26.73	18.74	38.14
Machinery	11.74	4.81	28.62	0.69	0.04	11.01	4.69	2.01	10.95
Drowning and Submersion	1.42	0.11	18.44	0.46	0.02	13.69	0.81	0.10	6.24
Poisoning	80.54	57.31	113.19	70.60	53.69	92.83	74.20	59.94	91.84
Adverse Effects	1075.14	979.52	1180.10	1005.84	935.46	1081.51	1030.92	973.58	1091.64
Suffocation	33.19	19.53	56.39	22.96	14.21	37.11	26.66	18.68	38.06
Foreign Body	34.81	20.74	58.41	22.96	14.21	37.11	27.25	19.16	38.74
Struck by Object	30.56	17.58	53.10	39.49	27.38	56.95	36.26	26.72	49.19
Cutting/Piercing	16.19	7.58	34.59	6.20	2.46	15.62	9.81	5.46	17.64
Firearms	0.40	0.00	49.23	0.00			0.15	0.00	17.82
Total	4627.59	4419.81	4835.36	6154.43	5973.96	6334.89	5601.78	5465.93	5741.01

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

Appendix B-3a

Average Annual Age-Specific Hospital Separation Rates per 100.000
and 95% Confidence Intervals, by Year and Gender, B.C., 1987-1998

YEAR	Male			Female		
	Rate	Lower Limit	Upper Limit	Rate	Lower Limit	Upper Limit
1987	1477.16	1454.70	1499.62	1342.60	1321.52	1363.67
1988	1439.20	1417.37	1461.03	1286.78	1266.45	1307.12
1989	1637.27	1614.37	1660.18	1374.08	1353.41	1394.74
1990	1381.81	1361.12	1402.51	1242.55	1223.21	1261.90
1991	1334.69	1314.65	1354.73	1261.20	1242.00	1280.40
1992	1318.41	1298.77	1338.06	1241.66	1222.91	1260.42
1993	1268.69	1249.69	1287.70	1236.21	1217.76	1254.66
1994	1238.78	1220.30	1257.26	1176.38	1158.68	1194.07
1995	1175.75	1158.03	1193.47	1167.16	1149.83	1184.50
1996	1123.72	1106.65	1140.79	1112.97	1096.27	1129.66
1997	1078.01	1061.49	1094.53	1085.70	1069.44	1101.96
1998	1024.47	1008.51	1040.43	1049.43	1033.62	1065.24

Appendix B-3b

Average Annual Age-Specific Rates per 100,000 and 95% Confidence Intervals,
by Year, Males, Ages 25-34

YEAR	Cause of Injury								
	Motor Vehicle Traffic*			Falls*			Struck by Object*		
	Rate	Lower Limit	Upper Limit	Rate	Lower Limit	Upper Limit	Rate	Lower Limit	Upper Limit
1987	349.5	329.7	370.5	262.5	245.5	280.8	215.48	200.05	232.10
1988	319.9	301.2	339.8	255.8	239.2	273.7	192.02	177.65	207.55
1989	333.0	314.1	352.9	284.7	267.4	303.3	193.55	179.31	208.92
1990	297.6	280.0	316.2	267.1	250.5	284.9	156.38	143.79	170.08
1991	257.3	241.1	274.5	242.3	226.6	259.0	130.75	119.35	143.23
1992	252.3	236.4	269.4	228.3	213.1	244.5	128.69	117.45	141.00
1993	239.1	223.7	255.6	208.8	194.4	224.2	132.67	121.33	145.07
1994	227.2	212.4	243.1	221.5	206.9	237.2	114.68	104.28	126.12
1995	207.2	193.1	222.2	190.8	177.3	205.2	106.62	96.71	117.56
1996	190.7	177.3	205.0	174.2	161.5	188.0	92.85	83.69	103.02
1997	172.8	160.1	186.5	182.5	169.5	196.6	92.44	83.29	102.61
1998	167.0	154.4	180.6	172.0	159.3	185.8	76.81	68.44	86.22

YEAR	Cause of Injury					
	Overexertion*			Late Effects*		
	Rate	Lower Limit	Upper Limit	Rate	Lower Limit	Upper Limit
1987	99.69	89.38	111.20	85.45	75.94	96.15
1988	99.18	89.01	110.52	91.62	81.87	102.54
1989	143.54	131.36	156.86	137.66	125.74	150.72
1990	90.96	81.48	101.55	93.83	84.19	104.57
1991	81.51	72.62	91.48	77.26	68.62	86.99
1992	80.01	71.26	89.84	63.79	56.02	72.63
1993	64.27	56.52	73.07	83.85	74.94	93.83
1994	65.30	57.57	74.07	72.05	63.90	81.23
1995	57.68	50.51	65.87	55.30	48.29	63.32
1996	53.47	46.63	61.31	46.95	40.57	54.33
1997	42.95	36.85	50.05	38.76	32.99	45.53
1998	51.74	44.95	59.56	46.14	39.75	53.56

* indicates significant trend at $p < 0.05$

Appendix B-3c

Average Annual Age-Specific Hospital Separation Rates per 100,000
and 95% Confidence Intervals, by Year, Females, Ages 25-34

YEAR	Cause of Injury								
	Motor Vehicle Traffic*			Falls*			Adverse Effects*		
	Rate	Lower Limit	Upper Limit	Rate	Lower Limit	Upper Limit	Rate	Lower Limit	Upper Limit
1987	152.5	139.6	166.7	132.0	120.0	145.2	117.37	106.10	129.83
1988	153.0	140.2	167.0	115.7	104.6	128.0	105.96	95.37	117.71
1989	141.5	129.3	154.8	163.5	150.4	177.8	110.12	99.44	121.95
1990	132.3	120.7	145.1	133.2	121.5	146.0	105.04	94.70	116.51
1991	122.0	110.8	134.3	118.5	107.5	130.6	111.19	100.57	122.93
1992	117.8	107.0	129.9	129.4	118.0	142.0	95.32	85.57	106.18
1993	131.4	119.9	143.9	116.2	105.5	128.1	98.23	88.38	109.18
1994	109.8	99.5	121.3	121.1	110.2	133.1	98.87	89.06	109.76
1995	112.0	101.6	123.5	105.9	95.8	117.1	90.43	81.14	100.79
1996	97.6	88.0	108.2	94.0	84.6	104.5	85.60	76.65	95.60
1997	80.6	72.0	90.3	81.7	73.0	91.5	81.46	72.76	91.20
1998	85.5	76.6	95.6	84.5	75.6	94.4	68.60	60.62	77.64

YEAR	Cause of Injury					
	Misadventure*			Late Effects*		
	Rate	Lower Limit	Upper Limit	Rate	Lower Limit	Upper Limit
1987	24.28	19.45	30.32	29.89	24.47	36.51
1988	29.31	24.00	35.81	40.92	34.54	48.47
1989	34.02	28.32	40.88	65.66	57.53	74.93
1990	40.20	34.00	47.53	36.38	30.51	43.39
1991	48.45	41.61	56.40	37.94	31.95	45.05
1992	51.70	44.66	59.86	29.75	24.53	36.09
1993	55.68	48.39	64.07	34.27	28.65	40.98
1994	50.84	43.95	58.81	27.81	22.84	33.86
1995	48.40	41.73	56.13	21.85	17.52	27.24
1996	40.22	34.24	47.25	24.73	20.14	30.37
1997	38.16	32.35	45.01	20.03	15.95	25.15
1998	26.24	21.48	32.05	21.87	17.56	27.22

* indicates significant trend at $p < 0.05$

Appendix B-3d

Average Annual Age-Specific Hospital Separation Rates per 100,000
and 95% Confidence Intervals, by Year, Males, Ages 35-44

YEAR	Cause of Injury								
	Falls*			Motor Vehicle Traffic*			Struck by Object*		
	Rate	Lower Limit	Upper Limit	Rate	Lower Limit	Upper Limit	Rate	Lower Limit	Upper Limit
1987	269.6	250.7	289.8	206.1	189.7	224.0	137.55	124.28	152.24
1988	253.0	235.1	272.3	211.9	195.6	229.6	130.76	118.08	144.81
1989	320.4	300.6	341.5	198.1	182.7	214.9	152.76	139.29	167.53
1990	246.3	229.5	264.4	191.2	176.4	207.2	109.30	98.26	121.58
1991	241.7	225.4	259.3	175.5	161.6	190.6	106.17	95.50	118.02
1992	249.8	233.3	267.4	158.1	145.1	172.2	105.27	94.79	116.92
1993	248.8	232.6	266.1	175.1	161.6	189.7	92.97	83.30	103.77
1994	238.2	222.6	254.8	157.1	144.6	170.7	100.86	90.92	111.88
1995	235.0	219.8	251.2	153.7	141.5	166.9	89.52	80.34	99.75
1996	216.5	202.2	231.8	149.4	137.5	162.2	71.37	63.35	80.41
1997	208.8	194.9	223.7	140.0	128.7	152.2	80.39	71.96	89.81
1998	188.7	175.7	202.7	140.5	129.3	152.7	66.24	58.72	74.74

YEAR	Cause of Injury					
	Late Effects*			Adverse Effects*		
	Rate	Lower Limit	Upper Limit	Rate	Lower Limit	Upper Limit
1987	67.49	58.38	78.01	71.91	62.49	82.75
1988	102.41	91.26	114.93	73.35	64.01	84.06
1989	158.52	144.79	173.55	74.52	65.29	85.04
1990	99.63	89.11	111.38	68.35	59.74	78.20
1991	84.19	74.76	94.81	76.45	67.49	86.61
1992	66.36	58.15	75.74	75.41	66.62	85.36
1993	72.51	64.02	82.12	68.71	60.46	78.08
1994	84.76	75.69	94.91	64.13	56.31	73.04
1995	53.22	46.25	61.24	76.69	68.23	86.20
1996	43.62	37.44	50.81	63.97	56.40	72.56
1997	48.54	42.09	55.98	73.20	65.17	82.21
1998	44.66	38.56	51.73	59.97	52.83	68.08

* indicates significant trend at $p < 0.05$

Appendix B-3e

Average Annual Age-Specific Hospital Separation Rates per 100,000
and 95% Confidence Intervals, by Year, Females, Ages 35-44

YEAR	Cause of Injury								
	Falls*			Adverse Effects*			Motor Vehicle Traffic*		
	Rate	Lower Limit	Upper Limit	Rate	Lower Limit	Upper Limit	Rate	Lower Limit	Upper Limit
1987	157.8	143.2	173.8	119.29	106.72	133.34	110.05	98.01	123.58
1988	176.0	160.9	192.5	123.07	110.57	136.98	110.21	98.42	123.41
1989	178.2	163.4	194.4	122.42	110.26	135.92	104.98	93.77	117.54
1990	169.8	155.8	185.2	125.87	113.85	139.17	85.24	75.45	96.30
1991	149.4	136.5	163.4	104.31	93.65	116.17	94.85	84.72	106.20
1992	159.0	145.9	173.2	128.47	116.77	141.35	94.60	84.63	105.74
1993	151.5	139.0	165.2	132.08	120.39	144.89	89.62	80.09	100.29
1994	134.1	122.5	146.8	108.25	97.91	119.68	82.96	73.97	93.05
1995	146.6	134.7	159.5	107.11	97.00	118.27	79.99	71.32	89.71
1996	128.8	117.8	140.7	95.57	86.19	105.97	70.61	62.62	79.63
1997	117.8	107.5	129.1	102.54	92.94	113.14	77.23	68.95	86.50
1998	127.4	116.8	139.1	93.80	84.73	103.85	61.19	53.94	69.40

YEAR	Cause of Injury					
	Misadventure			Late Effects*		
	Rate	Lower Limit	Upper Limit	Rate	Lower Limit	Upper Limit
1987	30.40	24.38	37.90	31.55	25.41	39.18
1988	31.59	25.58	39.03	41.88	34.86	50.32
1989	41.16	34.36	49.29	56.15	48.12	65.53
1990	37.00	30.75	44.53	39.32	32.85	47.05
1991	52.63	45.22	61.25	34.66	28.76	41.79
1992	55.84	48.31	64.55	25.33	20.43	31.41
1993	53.95	46.67	62.36	30.66	25.30	37.16
1994	42.33	36.05	49.71	26.71	21.82	32.69
1995	45.20	38.80	52.65	26.57	21.78	32.42
1996	43.54	37.36	50.74	22.83	18.48	28.20
1997	38.23	32.54	44.91	18.60	14.76	23.43
1998	35.40	29.99	41.77	16.18	12.67	20.67

* indicates significant trend at $p < 0.05$

Appendix B-3f

Average Annual Age-Specific Hospital Separation Rates per 100,000
and 95% Confidence Intervals, by Year, Males, Ages 45-64

YEAR	Cause of Injury								
	Falls*			Adverse Effects*			Motor Vehicle Traffic*		
	Rate	Lower Limit	Upper Limit	Rate	Lower Limit	Upper Limit	Rate	Lower Limit	Upper Limit
1987	362.9	343.3	383.5	200.99	186.58	216.51	163.92	150.95	177.99
1988	372.9	353.4	393.6	174.49	161.27	188.79	143.20	131.27	156.21
1989	398.3	378.3	419.3	166.11	153.39	179.87	135.96	124.50	148.46
1990	371.9	352.9	392.0	164.91	152.42	178.43	133.21	122.03	145.41
1991	311.7	294.6	329.8	174.96	162.27	188.64	125.41	114.74	137.07
1992	339.9	322.4	358.4	187.75	174.87	201.59	113.15	103.24	124.00
1993	294.1	278.2	310.9	160.44	148.80	173.00	120.87	110.82	131.82
1994	301.0	285.2	317.6	180.98	168.85	193.98	125.19	115.17	136.08
1995	298.4	283.0	314.6	164.62	153.30	176.77	123.95	114.19	134.56
1996	301.9	286.7	317.9	170.09	158.79	182.19	119.88	110.45	130.11
1997	275.9	261.7	290.9	146.20	135.95	157.23	109.55	100.72	119.16
1998	269.1	255.3	283.6	151.75	141.46	162.78	114.59	105.70	124.23

YEAR	Cause of Injury					
	Other Transport*			Struck by Object*		
	Rate	Lower Limit	Upper Limit	Rate	Lower Limit	Upper Limit
1987	24.62	19.90	30.45	21.98	17.53	27.57
1988	24.81	20.13	30.57	14.96	11.40	19.63
1989	21.93	17.61	27.30	17.74	13.86	22.71
1990	20.51	16.41	25.65	13.74	10.42	18.13
1991	20.90	16.81	25.99	11.50	8.53	15.51
1992	18.53	14.78	23.23	13.52	10.33	17.70
1993	26.78	22.27	32.20	10.71	7.97	14.39
1994	22.23	18.23	27.09	9.94	7.37	13.41
1995	15.87	12.62	19.97	6.61	4.62	9.45
1996	20.71	17.01	25.22	9.72	7.28	12.97
1997	17.12	13.84	21.17	11.14	8.56	14.52
1998	16.15	13.02	20.02	9.76	7.39	12.87

* indicates significant trend at $p < 0.05$

Appendix B-3g

Average Annual Age-Specific Hospital Separation Rates per 100,000
and 95% Confidence Intervals, by Year, Females, Ages 45-64

YEAR	Cause of Injury								
	Falls*			Adverse Effects*			Motor Vehicle Traffic*		
	Rate	Lower Limit	Upper Limit	Rate	Lower Limit	Upper Limit	Rate	Lower Limit	Upper Limit
1987	388.1	367.7	409.6	273.47	256.47	291.59	114.02	103.23	125.93
1988	367.1	347.5	387.8	239.91	224.17	256.76	125.13	113.91	137.46
1989	399.0	378.7	420.3	216.51	201.74	232.37	120.50	109.61	132.48
1990	344.4	325.9	364.0	220.44	205.70	236.24	101.43	91.59	112.32
1991	324.2	306.5	343.0	234.60	219.58	250.65	96.84	87.36	107.34
1992	329.3	311.8	347.8	226.50	212.08	241.90	95.14	85.96	105.30
1993	318.2	301.4	335.9	236.85	222.43	252.21	88.61	79.96	98.19
1994	308.0	291.9	325.0	207.66	194.51	221.70	81.63	73.54	90.61
1995	327.2	311.0	344.3	209.86	196.95	223.61	84.78	76.72	93.69
1996	300.6	285.4	316.6	192.86	180.74	205.78	70.76	63.58	78.76
1997	256.5	242.8	271.1	199.39	187.31	212.24	80.65	73.10	88.97
1998	278.4	264.3	293.2	177.54	166.38	189.46	73.36	66.31	81.16

YEAR	Cause of Injury					
	Misadventure*			Late Effects*		
	Rate	Lower Limit	Upper Limit	Rate	Lower Limit	Upper Limit
1987	32.83	27.28	39.51	33.71	28.08	40.47
1988	34.81	29.13	41.60	38.55	32.54	45.66
1989	42.23	35.99	49.56	63.35	55.59	72.19
1990	54.97	47.86	63.15	37.38	31.60	44.22
1991	56.18	49.07	64.31	29.43	24.41	35.47
1992	64.28	56.81	72.72	26.78	22.12	32.43
1993	57.21	50.34	65.01	27.99	23.32	33.61
1994	57.58	50.86	65.20	25.67	21.31	30.92
1995	54.17	47.81	61.38	22.02	18.10	26.79
1996	51.12	45.07	57.98	16.27	13.01	20.34
1997	41.74	36.41	47.85	16.82	13.56	20.86
1998	44.48	39.07	50.65	20.88	17.27	25.23

* indicates significant trend at $p < 0.05$

Appendix B-3h

Average Annual Age-Specific Hospital Separation Rates per 100,000
and 95% Confidence Intervals, by Year, Males, Ages 65-74

YEAR	Cause of Injury								
	Falls*			Adverse Effects			Motor Vehicle Traffic*		
	Rate	Lower Limit	Upper Limit	Rate	Lower Limit	Upper Limit	Rate	Lower Limit	Upper Limit
1987	673.5	628.6	721.7	559.75	518.90	603.81	149.77	129.36	173.40
1988	670.8	626.5	718.3	523.76	484.74	565.92	159.34	138.47	183.34
1989	700.1	655.3	748.0	518.30	479.95	559.72	174.63	152.97	199.36
1990	633.7	591.6	678.9	484.49	447.81	524.17	119.56	102.04	140.09
1991	615.8	574.9	659.6	552.08	513.40	593.68	128.92	110.93	149.83
1992	647.5	606.0	691.9	538.62	500.85	579.23	130.40	112.49	151.16
1993	609.2	569.4	651.7	547.11	509.51	587.48	110.43	94.25	129.39
1994	589.8	551.2	631.0	511.91	476.09	550.42	117.11	100.63	136.29
1995	586.9	548.8	627.6	562.81	525.54	602.74	120.41	103.83	139.64
1996	611.0	572.5	652.1	544.98	508.69	583.86	122.60	106.03	141.78
1997	591.9	554.2	632.1	501.32	466.76	538.43	125.16	108.49	144.40
1998	575.0	538.1	614.4	473.77	440.42	509.64	116.31	100.37	134.77

YEAR	Cause of Injury					
	Misadventure*			Late Effects*		
	Rate	Lower Limit	Upper Limit	Rate	Lower Limit	Upper Limit
1987	20.85	16.55	26.27	51.88	40.44	66.54
1988	26.78	21.90	32.74	46.58	35.93	60.38
1989	37.55	31.76	44.40	78.14	64.11	95.25
1990	47.96	41.44	55.50	55.48	43.97	70.01
1991	63.74	56.27	72.20	42.47	32.68	55.18
1992	65.71	58.27	74.10	51.86	41.03	65.55
1993	63.99	56.79	72.09	52.69	41.89	66.28
1994	59.42	52.64	67.07	42.78	33.28	54.98
1995	52.19	45.99	59.23	36.47	27.86	47.73
1996	42.05	36.62	48.29	34.36	26.11	45.21
1997	43.90	38.44	50.13	41.28	32.18	52.94
1998	37.74	32.79	43.45	30.23	22.64	40.35

* indicates significant trend at $p < 0.05$

Appendix B-3i

Average Annual Age-Specific Hospital Separation Rates per 100,000
and 95% Confidence Intervals, by Year, Females, Ages 65-74

YEAR	Cause of Injury								
	Falls*			Adverse Effects			Motor Vehicle Traffic*		
	Rate	Lower Limit	Upper Limit	Rate	Lower Limit	Upper Limit	Rate	Lower Limit	Upper Limit
1987	1026.1	975.7	1079.1	568.61	531.41	608.42	140.29	122.42	160.76
1988	997.7	948.6	1049.5	520.10	484.94	557.81	134.01	116.74	153.82
1989	1019.4	970.1	1071.2	501.24	467.03	537.95	135.58	118.35	155.31
1990	989.2	941.0	1039.9	474.69	441.67	510.17	138.10	120.82	157.85
1991	925.1	879.0	973.7	558.35	522.76	596.35	132.34	115.60	151.51
1992	944.1	897.7	992.8	538.39	503.66	575.51	133.35	116.63	152.47
1993	920.0	874.5	967.8	555.32	520.25	592.74	132.22	115.68	151.13
1994	891.2	846.8	937.9	560.86	525.89	598.15	123.43	107.60	141.58
1995	882.4	838.4	928.7	541.82	507.59	578.36	119.54	104.03	137.35
1996	878.2	834.4	924.4	515.20	481.89	550.81	109.63	94.84	126.72
1997	857.0	813.6	902.7	499.76	466.91	534.92	116.67	101.36	134.30
1998	822.9	780.5	867.7	468.26	436.50	502.32	95.58	81.82	111.65

YEAR	Cause of Injury					
	Misadventure*			Poisoning		
	Rate	Lower Limit	Upper Limit	Rate	Lower Limit	Upper Limit
1987	52.19	41.74	65.25	45.41	35.74	57.69
1988	73.64	61.14	88.69	42.46	33.23	54.24
1989	67.14	55.35	81.44	41.72	32.65	53.30
1990	92.50	78.56	108.91	30.19	22.68	40.18
1991	101.46	86.94	118.41	42.22	33.23	53.65
1992	102.82	88.27	119.77	37.39	29.03	48.15
1993	119.92	104.22	137.99	28.29	21.19	37.77
1994	101.64	87.38	118.24	34.49	26.60	44.71
1995	100.92	86.75	117.39	43.25	34.33	54.49
1996	101.84	87.63	118.36	36.54	28.43	46.97
1997	76.38	64.19	90.89	33.68	25.92	43.76
1998	70.93	59.22	84.96	33.66	25.91	43.74

* indicates significant trend at $p < 0.05$

Appendix B-3j

Average Annual Age-Specific Hospital Separation Rates per 100,000
and 95% Confidence Intervals, by Year, Males, Ages 75-79

YEAR	Cause of Injury								
	Falls*			Adverse Effects			Motor Vehicle Traffic*		
	Rate	Lower Limit	Upper Limit	Rate	Lower Limit	Upper Limit	Rate	Lower Limit	Upper Limit
1987	1371.8	1255.2	1499.3	794.37	706.86	892.71	202.82	160.99	255.52
1988	1266.2	1156.8	1385.8	849.49	760.80	948.51	236.57	191.96	291.54
1989	1317.1	1208.0	1436.0	830.22	744.56	925.72	166.56	130.61	212.39
1990	1183.5	1082.8	1293.6	762.23	682.29	851.52	168.03	132.71	212.75
1991	1160.4	1062.2	1267.8	938.27	850.37	1035.26	219.80	179.37	269.33
1992	1105.1	1009.9	1209.3	913.51	827.30	1008.70	168.22	133.52	211.93
1993	1038.9	946.5	1140.3	832.49	750.24	923.76	189.95	152.78	236.17
1994	1036.9	944.5	1138.3	912.28	825.87	1007.72	199.85	161.58	247.20
1995	1172.0	1074.8	1277.9	879.56	795.94	971.96	198.76	161.09	245.24
1996	1191.5	1095.6	1295.9	942.30	857.41	1035.60	155.23	123.01	195.88
1997	1104.7	1015.1	1202.3	849.15	770.99	935.24	119.54	92.42	154.63
1998	1049.0	963.6	1142.1	751.27	679.50	830.63	132.11	103.98	167.86

YEAR	Cause of Injury					
	Misadventure*			Poisoning		
	Rate	Lower Limit	Upper Limit	Rate	Lower Limit	Upper Limit
1987	104.23	75.52	143.85	61.97	40.81	94.12
1988	77.96	54.18	112.19	51.08	32.58	80.08
1989	105.06	77.36	142.68	51.25	33.06	79.44
1990	165.60	130.56	210.03	58.45	39.17	87.20
1991	181.98	145.55	227.53	42.54	26.80	67.52
1992	224.29	183.62	273.96	51.40	33.84	78.06
1993	157.12	123.66	199.63	46.90	30.26	72.70
1994	197.50	159.48	244.60	68.19	47.38	98.12
1995	185.05	148.84	230.07	57.11	38.59	84.53
1996	181.46	146.34	225.02	74.33	53.11	104.03
1997	140.15	110.50	177.76	45.34	29.86	68.86
1998	147.89	117.94	185.45	63.10	44.62	89.23

* indicates significant trend at $p < 0.05$

Appendix B-3k

Average Annual Age-Specific Hospital Separation Rates per 100,000
and 95% Confidence Intervals, by Year, Females, Ages 75-79

YEAR	Cause of Injury								
	Falls*			Adverse Effects			Motor Vehicle Traffic*		
	Rate	Lower Limit	Upper Limit	Rate	Lower Limit	Upper Limit	Rate	Lower Limit	Upper Limit
1987	2079.4	1955.6	2211.0	874.56	795.60	961.37	165.13	132.81	205.31
1988	2021.9	1902.4	2148.9	746.24	675.03	824.96	171.91	139.50	211.85
1989	2013.6	1897.3	2137.0	750.92	681.23	827.73	183.56	150.74	223.52
1990	2007.2	1893.7	2127.5	738.09	670.54	812.45	152.22	123.22	188.05
1991	1958.4	1847.7	2075.7	940.35	864.63	1022.71	177.72	146.51	215.58
1992	1932.2	1823.4	2047.5	828.33	758.14	905.02	165.67	135.91	201.94
1993	1990.4	1880.2	2107.0	818.67	749.09	894.70	139.53	112.52	173.02
1994	1904.1	1796.6	2018.1	818.93	749.47	894.83	145.70	118.09	179.77
1995	2017.6	1908.5	2133.0	792.76	725.45	866.31	129.96	104.39	161.80
1996	1947.1	1842.1	2058.1	850.51	782.08	924.93	185.37	154.88	221.85
1997	1862.0	1761.7	1968.1	791.21	726.75	861.38	117.49	94.24	146.48
1998	1807.3	1710.1	1910.0	788.70	725.41	857.52	149.41	123.28	181.07

YEAR	Cause of Injury					
	Misadventure*			Poisoning		
	Rate	Lower Limit	Upper Limit	Rate	Lower Limit	Upper Limit
1987	85.62	63.28	115.86	91.74	68.49	122.87
1988	64.47	45.83	90.68	85.95	63.96	115.50
1989	66.75	48.15	92.54	38.94	25.39	59.72
1990	104.43	80.91	134.79	49.56	34.22	71.78
1991	136.31	109.33	169.94	39.68	26.37	59.72
1992	125.10	99.61	157.11	43.95	29.93	64.55
1993	154.66	126.07	189.72	55.47	39.44	78.03
1994	127.28	101.65	159.37	82.06	62.02	108.58
1995	138.08	111.64	170.79	68.23	50.42	92.33
1996	109.04	86.27	137.82	70.10	52.34	93.88
1997	108.57	86.31	136.56	75.85	57.64	99.80
1998	99.13	78.29	125.51	57.46	42.15	78.34

* indicates significant trend at $p < 0.05$

Appendix B-3I

Average Annual Age-Specific Hospital Separation Rates per 100,000
and 95% Confidence Intervals. by Year. Males. Ages 80+

YEAR	Cause of Injury								
	Falls			Adverse Effects			Motor Vehicle Traffic		
	Rate	Lower Limit	Upper Limit	Rate	Lower Limit	Upper Limit	Rate	Lower Limit	Upper Limit
1987	2743.2	2569.8	2928.3	968.18	867.41	1080.67	194.86	152.51	248.95
1988	2660.9	2493.3	2839.7	1054.98	951.44	1169.78	219.79	175.27	275.61
1989	3058.8	2882.1	3246.3	1178.39	1070.67	1296.96	194.52	153.64	246.29
1990	2877.4	2709.5	3055.7	974.47	878.83	1080.52	221.96	178.76	275.60
1991	2708.2	2548.3	2878.2	963.67	870.20	1067.19	214.15	172.47	265.90
1992	2821.2	2661.5	2990.5	1052.66	956.86	1158.04	199.56	160.29	248.45
1993	2784.6	2628.9	2949.5	1081.69	986.33	1186.27	201.47	162.68	249.51
1994	2721.8	2571.5	2880.9	1104.73	1010.47	1207.78	196.70	159.23	243.00
1995	2690.0	2543.7	2844.7	1198.22	1101.90	1302.96	170.86	136.86	213.32
1996	2788.5	2641.6	2943.5	1147.69	1054.86	1248.69	210.41	172.79	256.22
1997	2729.2	2586.2	2880.2	1121.75	1031.41	1219.99	214.06	176.63	259.42
1998	2708.2	2567.3	2856.8	1006.02	921.59	1098.18	164.99	132.88	204.86

YEAR	Cause of Injury					
	Misadventure			Poisoning		
	Rate	Lower Limit	Upper Limit	Rate	Lower Limit	Upper Limit
1987	85.25	58.86	123.47	91.34	63.86	130.64
1988	61.54	40.12	94.39	90.85	63.89	129.18
1989	101.49	73.21	140.70	76.12	52.20	110.99
1990	140.76	107.26	184.72	78.50	54.55	112.96
1991	180.20	142.32	228.15	91.41	65.63	127.31
1992	217.02	175.89	267.77	77.33	54.38	109.96
1993	143.91	111.73	185.34	67.16	46.37	97.26
1994	148.67	116.59	189.59	77.77	55.57	108.84
1995	133.62	103.97	171.74	87.62	64.27	119.45
1996	146.65	115.83	185.68	95.64	71.41	128.10
1997	156.43	124.93	195.86	61.75	43.17	88.31
1998	96.58	72.78	128.16	76.46	55.63	105.08

* indicates significant trend at $p < 0.05$

Appendix B-3m

Average Annual Age-Specific Hospital Separation Rates per 100,000
and 95% Confidence Intervals, by Year, Females, Ages 80+

YEAR	Cause of Injury								
	Falls*			Adverse Effects			Motor Vehicle Traffic		
	Rate	Lower Limit	Upper Limit	Rate	Lower Limit	Upper Limit	Rate	Lower Limit	Upper Limit
1987	4798.6	4622.9	4981.0	1031.00	951.27	1117.41	146.04	117.93	180.87
1988	4471.6	4304.9	4644.7	936.96	862.36	1018.02	172.95	142.58	209.80
1989	4870.1	4699.5	5046.9	890.16	818.92	967.61	117.72	93.59	148.08
1990	4383.4	4224.7	4548.0	980.29	906.76	1059.77	120.99	96.91	151.05
1991	4704.7	4543.6	4871.6	1002.84	929.92	1081.48	151.77	124.99	184.27
1992	4548.1	4393.2	4708.4	1032.95	960.53	1110.83	117.93	95.10	146.24
1993	4436.2	4286.2	4591.5	1096.41	1023.09	1174.98	151.75	125.99	182.77
1994	4345.3	4200.5	4495.0	1096.06	1024.55	1172.56	135.06	111.44	163.68
1995	4483.2	4339.5	4631.6	1020.48	953.13	1092.60	132.51	109.64	160.16
1996	4420.6	4280.1	4565.7	1020.22	953.89	1091.17	135.63	112.79	163.09
1997	4505.9	4366.8	4649.6	1021.72	956.57	1091.30	116.60	95.94	141.71
1998	4491.9	4354.9	4633.2	921.03	860.14	986.24	153.69	130.00	181.71

YEAR	Cause of Injury					
	Misadventure			Poisoning		
	Rate	Lower Limit	Upper Limit	Rate	Lower Limit	Upper Limit
1987	67.81	49.54	92.81	88.67	67.39	116.67
1988	40.30	27.01	60.13	75.56	56.42	101.20
1989	77.41	58.33	102.72	75.79	56.95	100.88
1990	114.78	91.39	144.15	55.84	40.28	77.41
1991	120.52	96.93	149.84	58.03	42.40	79.42
1992	99.46	78.69	125.71	58.25	42.89	79.12
1993	106.63	85.41	133.13	71.09	54.17	93.29
1994	84.41	66.20	107.64	74.02	57.10	95.97
1995	92.88	74.07	116.47	75.55	58.78	97.10
1996	74.42	58.02	95.45	73.22	56.97	94.10
1997	71.58	55.81	91.81	81.97	64.96	103.44
1998	78.53	62.13	99.26	60.58	46.40	79.10

* indicates significant trend at $p < 0.05$

Appendix B-4a

Average Annual Age-Specific Hospital Separation Rate Ratios
and 95% Confidence Intervals, 1987-1998, Males, Ages 25-64

Males

Health Region	Age Group								
	25-34			35-44			45-64		
	Rate	Lower Limit	Upper Limit	Rate	Lower Limit	Upper Limit	Rate	Lower Limit	Upper Limit
E. Kootenay	1.78	1.43	2.22	1.58	1.27	1.98	1.37	1.15	1.63
W. Kootenay	2.07	1.67	2.57	1.71	1.38	2.13	1.50	1.27	1.77
N. Okanagan	1.75	1.43	2.16	1.70	1.39	2.09	1.31	1.12	1.53
S. Okanagan	1.18	0.98	1.44	1.20	0.99	1.45	1.21	1.05	1.38
Thompson	1.99	1.66	2.39	1.74	1.44	2.11	1.56	1.35	1.80
Fraser Valley	1.25	1.05	1.50	1.23	1.02	1.48	1.36	1.19	1.56
S. Fraser Valley	0.99	0.84	1.16	0.89	0.75	1.05	1.01	0.89	1.14
Simon Fraser	0.98	0.83	1.17	0.95	0.79	1.14	1.14	1.00	1.30
Coast Garibaldi	2.26	1.84	2.77	1.72	1.37	2.15	1.50	1.26	1.79
Central Vancouver Island	1.33	1.11	1.59	1.12	0.92	1.35	1.08	0.94	1.24
Upper Island / Central Coast	2.00	1.66	2.41	1.65	1.36	2.02	1.33	1.14	1.56
Cariboo	2.39	1.95	2.92	1.99	1.61	2.46	1.72	1.46	2.03
North West	2.02	1.67	2.44	1.93	1.58	2.35	1.85	1.58	2.16
Peace Liard	1.75	1.41	2.16	1.72	1.37	2.17	1.60	1.32	1.93
Northern Interior	1.67	1.39	2.00	1.57	1.30	1.91	1.31	1.12	1.53
Vancouver	0.42	0.36	0.49	0.50	0.42	0.59	0.49	0.44	0.56
Burnaby	0.79	0.65	0.97	0.73	0.58	0.91	0.95	0.82	1.11
North Shore	0.81	0.65	1.00	0.72	0.58	0.91	0.75	0.64	0.87
Richmond	0.73	0.58	0.92	0.63	0.49	0.81	0.81	0.68	0.96
Capital	0.94	0.79	1.12	0.93	0.77	1.11	0.95	0.83	1.09

Appendix B-4b

Average Annual Age-Specific Hospital Separation Rate Ratios
and 95% Confidence Intervals, 1987-1998, Males, Ages 65+

Males

Health Region	Age Group								
	65-74			75-79			80+		
	Rate	Lower Limit	Upper Limit	Rate	Lower Limit	Upper Limit	Rate	Lower Limit	Upper Limit
E. Kootenay	1.15	0.92	1.44	1.16	0.83	1.62	1.20	0.90	1.61
W. Kootenay	1.32	1.08	1.61	1.27	0.95	1.69	1.42	1.11	1.82
N. Okanagan	1.11	0.92	1.34	1.02	0.77	1.36	1.06	0.83	1.36
S. Okanagan	1.20	1.03	1.39	1.21	0.97	1.51	1.12	0.91	1.36
Thompson	1.37	1.14	1.65	1.44	1.09	1.92	1.52	1.18	1.97
Fraser Valley	1.33	1.14	1.55	1.36	1.08	1.72	1.31	1.06	1.61
S. Fraser Valley	1.14	0.98	1.32	1.24	1.01	1.53	1.21	1.00	1.46
Simon Fraser	1.40	1.20	1.65	1.50	1.18	1.90	1.43	1.15	1.77
Coast Garibaldi	1.39	1.13	1.72	1.22	0.87	1.71	1.64	1.23	2.18
Central Vancouver Island	1.00	0.86	1.18	1.03	0.82	1.31	1.06	0.86	1.32
Upper Island / Central Coast	1.24	1.01	1.51	1.16	0.84	1.59	1.23	0.92	1.65
Cariboo	1.41	1.12	1.77	1.32	0.90	1.94	1.42	0.99	2.03
North West	1.63	1.29	2.06	1.82	1.26	2.63	1.68	1.19	2.38
Peace Liard	1.34	1.01	1.77	1.31	0.83	2.08	1.13	0.75	1.72
Northern Interior	1.27	1.02	1.58	1.29	0.90	1.87	1.48	1.07	2.05
Vancouver	0.49	0.42	0.57	0.49	0.39	0.60	0.52	0.43	0.62
Burnaby	1.04	0.88	1.25	1.11	0.86	1.44	1.14	0.91	1.43
North Shore	0.86	0.71	1.04	0.84	0.64	1.12	0.90	0.71	1.16
Richmond	1.05	0.86	1.29	1.11	0.83	1.48	1.26	0.97	1.63
Capital	1.01	0.87	1.17	0.97	0.78	1.20	1.04	0.86	1.25

Appendix B-5a

Average Annual Age-Specific Hospital Separation Rate Ratios
and 95% Confidence Intervals, 1987-1998, Females, Ages 25-64

Females

Health Region	Age Group								
	25-34			35-44			45-64		
	Rate	Lower Limit	Upper Limit	Rate	Lower Limit	Upper Limit	Rate	Lower Limit	Upper Limit
E. Kootenay	1.43	1.07	1.90	1.31	1.00	1.72	1.45	1.20	1.75
W. Kootenay	1.87	1.43	2.45	1.54	1.19	1.99	1.44	1.20	1.73
N. Okanagan	1.50	1.15	1.95	1.27	0.99	1.63	1.28	1.08	1.52
S. Okanagan	1.31	1.05	1.65	1.12	0.90	1.40	1.14	0.98	1.33
Thompson	1.85	1.48	2.32	1.61	1.29	2.01	1.64	1.40	1.92
Fraser Valley	1.37	1.11	1.70	1.40	1.13	1.72	1.36	1.17	1.57
S. Fraser Valley	1.02	0.84	1.24	1.01	0.84	1.22	1.09	0.96	1.24
Simon Fraser	1.07	0.87	1.31	1.07	0.87	1.30	1.18	1.02	1.36
Coast Garibaldi	1.95	1.50	2.54	1.76	1.36	2.28	1.56	1.29	1.90
Central Vancouver Island	1.25	1.00	1.56	1.13	0.92	1.40	1.05	0.90	1.22
Upper Island / Central Coast	1.60	1.26	2.04	1.28	1.01	1.64	1.20	1.00	1.43
Cariboo	1.94	1.49	2.52	1.85	1.44	2.37	1.66	1.37	2.00
North West	2.00	1.59	2.53	1.86	1.47	2.36	2.05	1.72	2.44
Peace Liard	1.64	1.25	2.15	1.66	1.26	2.19	1.62	1.31	2.01
Northern Interior	1.57	1.25	1.97	1.46	1.16	1.83	1.38	1.16	1.64
Vancouver	0.44	0.37	0.53	0.46	0.38	0.55	0.46	0.41	0.53
Burnaby	0.79	0.62	1.01	0.86	0.68	1.10	0.95	0.81	1.12
North Shore	0.78	0.60	1.01	0.72	0.56	0.92	0.74	0.63	0.88
Richmond	0.75	0.57	0.99	0.84	0.65	1.07	0.91	0.76	1.08
Capital	1.11	0.90	1.36	1.10	0.90	1.34	1.00	0.87	1.15

Appendix B-5b

Average Annual Age-Specific Hospital Separation Rate Ratios
and 95% Confidence Intervals, 1987-1998, Females, Ages 65+

Females

Health Region	Age Group								
	65-74			75-79			80+		
	Rate	Lower Limit	Upper Limit	Rate	Lower Limit	Upper Limit	Rate	Lower Limit	Upper Limit
E. Kootenay	1.30	1.04	1.62	1.28	0.95	1.73	1.41	1.13	1.76
W. Kootenay	1.34	1.09	1.64	1.45	1.12	1.88	1.55	1.29	1.88
N. Okanagan	1.14	0.95	1.38	1.11	0.86	1.43	1.18	0.98	1.43
S. Okanagan	1.13	0.97	1.32	1.11	0.91	1.36	1.19	1.02	1.38
Thompson	1.53	1.27	1.85	1.50	1.16	1.95	1.46	1.19	1.78
Fraser Valley	1.39	1.18	1.62	1.36	1.11	1.68	1.36	1.16	1.59
S. Fraser Valley	1.16	1.00	1.34	1.26	1.04	1.52	1.25	1.08	1.44
Simon Fraser	1.39	1.18	1.63	1.41	1.14	1.73	1.34	1.15	1.56
Coast Garibaldi	1.53	1.23	1.90	1.75	1.32	2.31	1.94	1.58	2.39
Central Vancouver Island	1.04	0.89	1.23	1.13	0.92	1.40	1.11	0.94	1.31
Upper Island / Central Coast	1.22	0.99	1.50	1.27	0.95	1.69	1.33	1.06	1.65
Cariboo	1.57	1.23	2.00	1.76	1.24	2.48	1.62	1.22	2.15
North West	1.89	1.49	2.40	2.08	1.48	2.92	2.06	1.59	2.66
Peace Liard	1.27	0.92	1.74	1.37	0.88	2.11	1.37	0.99	1.90
Northern Interior	1.31	1.03	1.66	1.17	0.81	1.68	1.44	1.09	1.88
Vancouver	0.48	0.42	0.56	0.49	0.40	0.59	0.52	0.46	0.60
Burnaby	1.04	0.88	1.24	1.07	0.85	1.34	1.16	0.98	1.36
North Shore	0.91	0.76	1.09	0.94	0.74	1.19	0.98	0.83	1.16
Richmond	1.04	0.85	1.26	1.15	0.89	1.49	1.26	1.05	1.52
Capital	0.99	0.85	1.14	1.02	0.84	1.23	1.05	0.91	1.20

Appendix B-6a

Average Annual Hospital Separation Rates per 100,000
and 95% Confidence Intervals, 1987-1998, BC, by Nature of Injury and Gender,
Ages 25-34

Nature of Injury	Male			Female		
	Rate	Lower Limit	Upper Limit	Rate	Lower Limit	Upper Limit
Fracture of Upper Limb	99.60	89.79	110.48	39.72	33.62	46.91
Fracture of Lower Limb	179.47	166.13	193.89	76.25	67.62	85.99
Other Fractures	136.28	124.72	148.92	47.82	41.08	55.66
Dislocations & Sprains	134.52	123.03	147.07	56.16	48.82	64.60
Intracranial Injuries	72.39	64.10	81.76	30.85	25.54	37.27
Internal Injuries	40.47	34.40	47.62	14.19	10.74	18.75
Wounds	123.30	112.32	135.34	31.69	26.30	38.18
Late Effect of Injuries	58.08	50.71	66.53	24.97	20.24	30.81
Contusions and Superficial Injuries	48.53	41.83	56.31	26.00	21.16	31.94
Burns/Corrosions	27.51	22.58	33.51	7.22	4.88	10.67
Poisoning by Drugs	31.34	26.05	37.71	43.87	37.45	51.41
Environmental Injuries	21.42	17.13	26.79	10.42	7.53	14.42
Other	31.06	25.80	37.40	9.96	7.15	13.90
Unknown	91.68	82.28	102.14	142.00	130.02	155.07

Appendix B-6b

Average Annual Hospital Separation Rates per 100.000
and 95% Confidence Intervals, 1987-1998, BC, by Nature of Injury and Gender,
Ages 35-44

Nature of Injury	Male			Female		
	Rate	Lower Limit	Upper Limit	Rate	Lower Limit	Upper Limit
Fracture of Upper Limb	86.72	77.32	97.25	45.50	38.79	53.37
Fracture of Lower Limb	168.88	155.56	183.34	94.72	84.81	105.80
Other Fractures	116.33	105.36	128.44	43.82	37.25	51.56
Dislocations & Sprains	107.87	97.33	119.55	49.77	42.73	57.97
Intracranial Injuries	55.54	48.13	64.10	28.28	23.10	34.62
Internal Injuries	31.07	25.66	37.64	12.00	8.80	16.38
Wounds	91.49	81.83	102.30	25.77	20.84	31.85
Late Effect of Injuries	60.14	52.41	69.02	24.36	19.59	30.29
Contusions and Superficial Injuries	37.01	31.05	44.11	20.94	16.56	26.50
Burns/Corrosions	22.07	17.58	27.70	6.86	4.55	10.34
Poisoning by Drugs	36.17	30.29	43.20	48.47	41.53	56.57
Environmental Injuries	20.76	16.42	26.24	9.77	6.92	13.78
Other	26.25	21.31	32.33	12.96	9.61	17.47
Unknown	122.14	110.89	134.54	153.51	140.74	167.44

Appendix B-6c

Average Annual Hospital Separation Rates per 100.000
and 95% Confidence Intervals, 1987-1998, BC, by Nature of Injury and Gender,
Ages 45-64

Nature of Injury	Male			Female		
	Rate	Lower Limit	Upper Limit	Rate	Lower Limit	Upper Limit
Fracture of Upper Limb	87.06	78.58	96.45	97.02	87.97	107.01
Fracture of Lower Limb	169.26	157.26	182.16	191.13	178.25	204.95
Other Fractures	123.40	113.22	134.49	66.09	58.70	74.42
Dislocations & Sprains	86.07	77.64	95.41	48.50	42.23	55.71
Intracranial Injuries	51.01	44.62	58.32	29.86	25.02	35.62
Internal Injuries	32.34	27.33	38.26	14.14	10.94	18.28
Wounds	75.54	67.67	84.32	24.66	20.31	29.95
Late Effect of Injuries	51.51	45.08	58.85	26.18	21.68	31.61
Contusions and Superficial Injuries	38.11	32.64	44.49	29.63	24.82	35.38
Burns/Corrosions	19.83	16.00	24.57	7.56	5.32	10.73
Poisoning by Drugs	51.09	44.70	58.40	63.09	55.87	71.23
Environmental Injuries	23.08	18.91	28.16	13.47	10.36	17.53
Other	29.88	25.08	35.59	16.81	13.28	21.27
Unknown	272.15	256.83	288.39	287.53	271.62	304.36

Appendix B-6d

Average Annual Hospital Separation Rates per 100,000
and 95% Confidence Intervals, 1987-1998, BC, by Nature of Injury and Gender,
Ages 65-74

Nature of Injury	Male			Female		
	Rate	Lower Limit	Upper Limit	Rate	Lower Limit	Upper Limit
Fracture of Upper Limb	99.85	84.42	118.09	213.70	192.21	237.59
Fracture of Lower Limb	270.58	244.35	299.62	508.78	475.00	544.95
Other Fractures	183.78	162.40	207.98	156.63	138.39	177.27
Dislocations & Sprains	72.52	59.56	88.31	65.30	53.90	79.10
Intracranial Injuries	75.21	61.99	91.25	42.85	33.82	54.30
Internal Injuries	36.96	28.05	48.70	19.68	13.88	27.91
Wounds	92.53	77.73	110.15	41.29	32.45	52.55
Late Effect of Injuries	44.10	34.26	56.77	28.59	21.40	38.20
Contusions and Superficial Injuries	71.91	59.01	87.64	78.05	65.50	93.01
Burns/Corrosions	17.38	11.63	25.99	9.48	5.73	15.68
Poisoning by Drugs	122.72	105.49	142.78	136.68	119.72	156.05
Environmental Injuries	31.53	23.39	42.51	18.33	12.76	26.32
Other	43.73	33.94	56.36	25.77	19.00	34.97
Unknown	730.24	686.31	776.99	647.65	609.39	688.30

Appendix B-6e

Average Annual Hospital Separation Rates per 100.000
and 95% Confidence Intervals, 1987-1998, BC, by Nature of Injury and Gender,
Ages 75-79

Nature of Injury	Male			Female		
	Rate	Lower Limit	Upper Limit	Rate	Lower Limit	Upper Limit
Fracture of Upper Limb	132.86	102.40	172.37	319.90	277.42	368.90
Fracture of Lower Limb	504.47	441.38	576.59	1074.71	994.32	1161.60
Other Fractures	294.05	246.84	350.29	314.27	272.18	362.86
Dislocations & Sprains	85.58	61.87	118.37	85.26	64.69	112.37
Intracranial Injuries	117.03	88.68	154.45	78.64	58.99	104.82
Internal Injuries	44.94	28.72	70.31	25.23	15.19	41.90
Wounds	137.35	106.32	177.44	78.36	58.75	104.50
Late Effect of Injuries	45.52	29.18	71.03	46.08	31.66	67.08
Contusions and Superficial Injuries	147.12	114.87	188.42	181.23	149.97	219.01
Burns/Corrosions	22.08	11.66	41.82	16.91	9.10	31.43
Poisoning by Drugs	209.64	170.40	257.93	226.33	191.06	268.11
Environmental Injuries	35.17	21.20	58.34	21.28	12.25	36.98
Other	59.40	40.24	87.67	33.54	21.60	52.08
Unknown	1168.77	1070.54	1276.01	961.26	885.40	1043.63

Appendix B-6f

Average Annual Hospital Separation Rates per 100,000
and 95% Confidence Intervals, 1987-1998, BC, by Nature of Injury and Gender,
Ages 80+

Nature of Injury	Male			Female		
	Rate	Lower Limit	Upper Limit	Rate	Lower Limit	Upper Limit
Fracture of Upper Limb	209.04	169.23	258.21	474.91	427.33	527.78
Fracture of Lower Limb	1302.80	1197.09	1417.84	2572.46	2458.39	2691.82
Other Fractures	540.71	474.15	616.61	654.56	598.28	716.15
Dislocations & Sprains	112.31	84.19	149.83	139.71	115.00	169.72
Intracranial Injuries	184.76	147.57	231.30	139.82	115.10	169.85
Internal Injuries	66.17	45.46	96.32	25.14	15.89	39.78
Wounds	228.06	186.30	279.18	169.44	141.99	202.19
Late Effect of Injuries	54.03	35.66	81.86	65.89	49.63	87.48
Contusions and Superficial Injuries	349.48	296.80	411.50	431.29	386.06	481.81
Burns/Corrosions	29.14	16.55	51.31	24.34	15.27	38.80
Poisoning by Drugs	285.13	237.95	341.66	277.23	241.46	318.31
Environmental Injuries	39.46	24.27	64.17	24.34	15.27	38.80
Other	77.30	54.62	109.41	54.41	39.84	74.33
Unknown	1366.74	1258.37	1484.46	1178.61	1102.22	1260.29

Appendix B-7

Categories of Place of Occurrence of Injuries

HOME

Apartment
Boarding house
Farm house
Home (Premised)
House (Residential)
Non-Institutional Place of Residence

Private: Driveway to Home
Garage
Garden to Home Walk to Home
Swimming Pool in Private House or Garden
Yard to Home

Excludes: *Home under construction but not yet occupied.
Institutional place of residence.*

FARM

Buildings
Land under Cultivation

Excludes: *Farm house and home premises of farm.*

MINE AND QUARRY

Gravel Pit
Sand Pit
Tunnel under Construction

INSTITUTIONAL PLACE AND PREMISES

Building under Construction
Dockyard
Dry Dock Factory: Building, Premises
Garage-Place of Work
Industrial Yard

Loading Platform (Factory, Store)
Plant, Industrial
Railway Yard Shop Place of Work
Warehouse
Workshop

PLACE FOR RECREATION AND SPORT

Amusement Park
Baseball Field
Basketball Court
Beach Resort
Cricket Ground
Fives Court
Football Field
Golf Course
Gymnasium
Hockey Field
Holiday Camp
Ice Palace
Lake Resort
Playground, including School Playground

Public Park
Race Course
Resort NOS
Riding School
Rifle Range
Seashore Resort
Skating Rink
Sports Ground
Sports Palace
Stadium
Swimming Pool, Public
Tennis Court
Vacation Resort
Mountain resort

Excludes: *Swimming pool in private house or garden.*

PUBLIC BUILDING

Building (including adjacent grounds) used by the general public or by a particular group of the public, such as:

Airport	Garage Building (For Car Storage)	Post Office
Bank	Hotel	Public Hall
Café	Market (Grocery Or Other Commodity)	Radio Broadcasting Station
Casino	Movie House	Restaurant
Church	Music Hall	School (Private, Public)
Cinema	Night Club	Shop, Commercial
Clubhouse	Office	Station (Bus, Railway)
Court House	Office Building	Store
Dance Hall	Opera House	Theatre

Excludes: Home garage, industrial building or workplace.

RESIDENTIAL INSTITUTION

Children's Home	Nursing Home
Dormitory	Orphanage
Hospital	Prison
Jail	Reform School

STREET OR HIGHWAY

Lane
Footpath
Freeway

Excludes: Private Driveway.

OTHER SPECIFIED PLACES

Beach NOS	Mountain	Reservoir
Canal	Parking Lot	River
Caravan Site NOS	Parking Place	Sea
Derelict House	Pond Or Pool (Natural)	Seashore NOS
Dock Forest Harbour	Prairie	Stream
Hill	Public Place NOS	Swamp
Lake NOS	Railway Line	Woods

Appendix B-8

Average Annual Hospital Separation Rates per 100,000 and 95% Confidence Intervals,
1987-1998, B.C., by Place of Occurrence and Gender

Place of Occurrence	Male			Female			Total		
	Rate	Lower Limit	Upper Limit	Rate	Lower Limit	Upper Limit	Rate	Lower Limit	Upper Limit
Home	233.25	225.20	241.58	322.50	313.18	332.10	278.67	272.47	285.01
Work Place	104.29	98.96	109.92	8.97	7.53	10.70	55.78	53.05	58.66
Place for Recreation / Sport	64.73	60.56	69.19	30.62	27.84	33.67	47.37	44.85	50.03
Street / Highway	17.75	15.63	20.16	26.44	23.87	29.29	22.18	20.47	24.02
Public Building	21.43	19.09	24.07	31.03	28.23	34.10	26.32	24.46	28.32
Residential Institutional	48.36	44.77	52.23	102.13	96.95	107.60	75.72	72.52	79.07
Other specified Places	41.75	38.42	45.36	22.79	20.41	25.45	32.10	30.04	34.30
Unspecified Places	77.66	73.08	82.53	57.43	53.57	61.56	67.36	64.35	70.52

Appendix B-9a

Average Annual Age-Specific Rates per 100,000 and 95% Confidence Intervals,
by Place of Occurrence and Age Group, Males

Place of Occurrence	Age Group								
	25-34			35-44			45-64		
	Rate	Lower Limit	Upper Limit	Rate	Lower Limit	Upper Limit	Rate	Lower Limit	Upper Limit
Home	115.72	105.11	127.41	133.13	121.36	146.04	193.76	180.90	207.54
Work Place	139.84	128.12	152.63	126.25	114.80	138.84	102.90	93.64	113.07
Place for Recreation	111.84	101.42	123.34	76.62	67.82	86.56	37.23	31.83	43.55
Street / Highway	10.15	7.34	14.05	12.22	9.01	16.59	15.64	12.28	19.92
Public Building	19.10	15.07	24.20	17.22	13.31	22.27	18.44	14.76	23.04
Residential Institutional	5.44	3.49	8.47	7.37	4.98	10.93	16.10	12.69	20.43
Other Specified Places	50.67	43.81	58.60	46.96	40.18	54.88	34.89	29.68	41.02
Unspecified Places	66.63	58.70	75.64	70.24	61.84	79.78	70.92	63.31	79.44

Place of Occurrence	Age Group								
	65-74			75-79			80+		
	Rate	Lower Limit	Upper Limit	Rate	Lower Limit	Upper Limit	Rate	Lower Limit	Upper Limit
Home	406.36	373.92	441.60	680.90	606.93	763.90	1440.81	1329.42	1561.54
Work Place	19.03	12.96	27.95	8.79	3.20	24.19	11.13	4.46	27.80
Place for Recreation	22.63	15.91	32.19	23.64	12.75	43.83	20.03	10.13	39.64
Street / Highway	27.94	20.34	38.37	45.72	29.33	71.26	88.03	63.57	121.90
Public Building	25.25	18.09	35.26	37.32	22.83	60.99	77.71	54.95	109.88
Residential Institutional	83.99	69.95	100.86	237.39	195.37	288.44	772.61	692.21	862.35
Other Specified Places	27.14	19.67	37.45	34.97	21.05	58.09	46.75	29.90	73.07
Unspecified Places	94.06	79.12	111.81	123.87	94.59	162.21	200.94	161.99	249.26

Appendix B-9b

Average Annual Age-Specific Rates per 100,000 and 95% Confidence Intervals,
by Place of Occurrence and Age Group, Females

Place of Occurrence	Age Group								
	25-34			35-44			45-64		
	Rate	Lower Limit	Upper Limit	Rate	Lower Limit	Upper Limit	Rate	Lower Limit	Upper Limit
Home	73.65	65.17	83.23	98.24	88.13	109.50	187.54	174.78	201.23
Work Place	8.65	6.05	12.36	10.07	7.17	14.14	10.83	8.08	14.52
Place for Recreation	39.50	33.43	46.68	32.70	27.09	39.47	26.56	22.03	32.03
Street / Highway	6.55	4.34	9.87	9.77	6.92	13.78	21.03	17.04	25.95
Public Building	13.00	9.72	17.39	13.61	10.17	18.22	24.14	19.83	29.38
Residential Institutional	7.12	4.81	10.55	7.43	5.01	11.03	17.29	13.71	21.81
Other Specified Places	11.59	8.52	15.78	14.67	11.07	19.42	22.79	18.62	27.89
Unspecified Places	32.64	27.16	39.23	32.97	27.34	39.77	47.73	41.51	54.89

Place of Occurrence	Age Group								
	65-74			75-79			80+		
	Rate	Lower Limit	Upper Limit	Rate	Lower Limit	Upper Limit	Rate	Lower Limit	Upper Limit
Home	536.89	502.17	574.02	1088.94	1008.00	1176.39	2213.15	2107.53	2324.06
Work Place	4.58	2.22	9.45	5.21	1.71	15.92	7.69	3.36	17.63
Place for Recreation	24.99	18.33	34.07	24.66	14.76	41.20	18.71	10.99	31.85
Street / Highway	49.00	39.27	61.14	91.32	69.94	119.24	126.39	103.00	155.09
Public Building	53.63	43.41	66.27	96.82	74.72	125.44	132.93	108.89	162.29
Residential Institutional	90.91	77.28	106.95	329.21	286.06	378.86	1313.38	1232.60	1399.45
Other Specified Places	34.42	26.43	44.82	52.42	36.87	74.55	64.06	48.05	85.39
Unspecified Places	82.27	69.35	97.59	136.70	109.92	170.00	224.08	192.16	261.30

LIST OF ABBREVIATIONS

BC	British Columbia
CDC	Centre for Disease Control
CHIRPP	Canadian Hospitals Injury Reporting and Prevention Program
CI	Confidence Interval
ED	Emergency Department
HR	Health Region
ICD-9	International Classification of Diseases, Version 9
IPEC	Injury Prevention and Education
LARS-LAN	(Local Area Network) Accident Reporting System
LHA	Local Health Area
MV	Motor Vehicle
NHRDP	National Health Research and Development Program
SMR	Standardized Mortality Ratio (Chapter 2) Standardized Morbidity Ratio (Chapter 3)
WHO	World Health Organization