

# PATTERNS OF MOTOR VEHICLE TRAFFIC INJURIES IN BRITISH COLUMBIA, 1995-1998

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B.C. *Injury* Research  
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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 Child Health Research (CCCHR) 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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# REPORT

# A. Introduction

## 1. THE NEED FOR THIS STUDY

In 1995, Motor-vehicle traffic injuries (MVTI) represented 31 percent of all causes of death among Canadian males aged 15-19 years old, and 42 percent among Canadian females in the same age group (Health Canada, 2000). MVTI are the leading cause of death by injury in British Columbia among 0-24 years olds for both males and females (Soubhi, Raina et al., 1999). From 1987 to 1996, mortality rates involving MVTI for this group were 21.37 and 7.81 per 100,000 for males and females respectively. The rates for non-fatal injuries are equally as significant. This is clearly an issue that needs to be addressed.

In British Columbia an increasingly greater number of resources are being dedicated toward traffic safety. In 1998 more than 700 police positions were dedicated to traffic services and a considerable amount of funding was directed towards traffic safety equipment. It is not known however, how effective these resources are. In British Columbia, there is no province-wide measurement of the impact of current traffic services. No formal studies have been conducted in BC to identify high-risk traffic problems. There is also no provincial strategy for focusing traffic services on identifiable and achievable results.

This study is designed to develop a profile of fatal and non-fatal Motor Vehicle Traffic injuries in BC based on three categories of data: mortality, hospitalization, and emergency department. The ultimate goal is to identify meaningful and realistic recommendations for motor vehicle traffic safety.

## 2. OBJECTIVES OF THE ANALYSES

The specific objectives of the analyses are as follows:

- 1) Using mortality and hospital data for the period 1995-1998, examine Motor Vehicle Traffic Injuries in terms of age, gender, location (urban/rural: Health Region and/or Police Detachment), and causes (E-codes).
- 2) Using coroner's data for the same period (1995-1998), examine Motor Vehicle Traffic Injury deaths in terms of age, gender, police department, place of injury (township, premise, institute), blood alcohol reading, cause of death, and contributing factors to cause of death.
- 3) Using data from the BC Children's Hospital (BCCH) emergency department, examine Motor Vehicle Traffic Injuries in terms of age, gender, location, area, context, breakdown event, mechanism of injury, vehicle seating position, nature of injury, body part injured, and visit disposition

## 3. METHODOLOGY

Four data sets were used for the purpose of the present study: BC Vital Statistics mortality data, BC Coroner's mortality data, BC hospital separation data, and BC Children's Hospital emergency room data. More detail with respect to analysis for each of the data sets is included below.

### **3.1 Mortality by Motor Vehicle Traffic 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 1,645 deaths by MVTI for all ages that were known residents of BC during the period from 1995 to 1998<sup>1</sup>. 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 1). Mortality data was 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, and HR. Further analyses were conducted by comparing the age-standardized rates across the leading MVTI categories. Age-specific rates were used as much as possible. To take differences in age structures across regions and years into account, age standardized rates were calculated whenever total population groups were compared. Direct standardization was done using the 1996 age distribution population as a standard. Indirect standardization was done using the annual average provincial age-specific rates for the study period.

SPSS 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 (See Appendix 6). 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 expected number of 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 MVTI mortality of 20 percent relative to the province, while an SMR of 0.60 means that compared to the province the given area had 40 percent less MVTI 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.

### **3.2 Mortality by Motor Vehicle Injuries. BC Coroner's Data<sup>2</sup>.**

Counts of deaths were provided by the Office of the Chief Coroner. Like the mortality data and hospital separation data, the population denominators were provided by the BC Vital Statistics Agency. The data

<sup>1</sup> The agency assigns events to geographic regions based on the postal code of usual residence in all publications and data tables.

<sup>2</sup> The BC Coroners Service falls within the Ministry of the Attorney General. The Chief Coroner supervises the Service. There are 130 Coroners within BC, who come from a wide variety of backgrounds such as, medical, legal, legislative, business or other. Each Coroner is appointed by the Lieutenant Governor in Council upon the recommendation of the Attorney General. A Coroner's primary responsibility is to conduct public inquiries into sudden and unexpected deaths. He/she formally carries out this responsibility as directed by the Chief Coroner for the province. The Coroner functions administratively under the general supervision of the Regional Coroner and the direction and control of the Chief Coroner. The Coroner develops and maintains investigative and communicative links with officials from a wide range of municipal and federal authorities.

file for this study included all death caused by MVTI, which occurred in BC from 1995 to 1998. Cases were compiled by Police Detachment, age, gender, victim in MVTI, contributing means of death, place of injury, and blood alcohol reading of the deceased.

Data selection included cases of death by MVTI. Cases with missing information were excluded from analysis. The present report is based on 2,098 deaths by MVTI for all ages that were known residents of BC during the study period from 1995 to 1998. The population data contained four variables; year, Police Detachment, gender, and age (in five-year age groups). A fifth variable was created from the Police Detachment for Health Region (HR) according to the conversion table<sup>3</sup> (See Appendix 1). Coroner's data was then merged with the population data by matching the files with respect to year, gender, age group and HR.

## Analyses

Frequencies were obtained for MVTI deaths within each police detachment, as well as by victim in MVTI. SPSS Version 9 for Windows was used to obtain frequencies and 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 (See Appendix 6). Further analyses were conducted to derive death frequencies for premise of injury, blood alcohol level, victim of death, underlying factors leading to

death, and policing jurisdictions<sup>4</sup>. The blood alcohol level was categorized as above or below 0.08mg/ml, defining the threshold of legally impaired individuals.

## Cautions and Caveats

Similar cautions to those outlined for mortality data are recommended.

## 3.3 Hospital Separations due to Motor Vehicle Traffic Injuries

The BC Ministry of Health, Regional Performance Analysis Branch, provided separation data<sup>5</sup> for all injury hospitalizations in the province of BC for the fiscal years 1995 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. 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.

<sup>3</sup> Deaths on the Highway Patrol were excluded when converting to HR, as they were not classified as being part of the HR population. As well, these deaths could have occurred in any area of the highway and it would be difficult to classify under what regions they occurred.

<sup>4</sup> The provincial and municipal forces provide services to specific geographic locations within the province. Each geographical area is policed by either a municipal or a provincial force. The geographical structure used in this report is the one used in the twelfth edition of the annual Summary Statistics publication of police and crime data for the period 1988 to 1997.

<sup>5</sup> Hospitals must complete a discharge record for every patient admitted to their facilities. Every patient admitted to a BC hospital has a record produced upon discharge that includes details about the person and the related stay. Data are collected for each department (except emergency departments) including acute, rehabilitation, extended care and day surgery patients. Any person whose stay is over 6 hours must be formally admitted. Since a patient may be admitted to hospital and discharged several times during a given year, the data are counts of separations rather than individual patients or encounters. Data collection follows specifications laid out by the BC Ministry of Health and the abstracts are sent to the Canadian Institute for Health Information (CIHI) for coding and processing. Data are collected for the fiscal year April 1 to March 31 based on discharge date.

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## Analyses

The analyses were conducted on 20,316 hospital separations due to MVTI among males and females of all ages that were known residents of BC during the period from 1995 to 1998. The analyses followed a similar scheme 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).

### 3.4 Motor Vehicle Traffic Injuries Seen in Emergency Department

Data was extracted from the BC Children's Hospital (BCCH) Canadian Hospitals Injury Reporting and Prevention Program (CHIRPP) data system. CHIRPP is an emergency department-based surveillance system, organized and administered by the Laboratory Centre for Disease Control (LCDC), Health Protection Branch, Health Canada. Collecting information from participating hospitals since 1990, CHIRPP's aim has been to describe injury cases identified through emergency department visits, and to reduce the number and severity of injuries in children and youth through a better understanding of the circumstances in which these injuries occur (Health Canada, 1997). This system was founded on the premise that visits to emergency departments, unlike deaths and hospitalizations are not recorded in a central standardized manner enabling analyses at local, regional and national levels. CHIRPP

data has allowed researchers to look further into how, when, where and why injuries occur.

CHIRPP is highly flexible and can be used to determine the circumstances of all types of injuries that result in emergency department visits. The person accompanying the injured child to the emergency department receives a CHIRPP questionnaire. In-depth information is collected regarding the age, gender, date, time and place of injury occurrence, what the child was doing at the time of injury, what caused the injury, what type of energy transfer occurred to induce the injury (e.g. thermal, mechanical, etc.), any factors contributing to the injury, the nature of the injury, the part of the body affected by the injury, and what treatment was required. The attending physician completes a medical questionnaire indicating the nature of the injury and area of the body affected by the injury. Up to three injuries per visit can be recorded in the CHIRPP data system. The management of the child in the emergency department is recorded, and all information is coded by a trained data-entry clerk.

## Analyses

1180 records of MVTI treated at BCCH were available for the four-year study period 1995 to 1998. The CHIRPP data, stored in EPI-Info format, was analyzed using EPI-Info software (Version 6). Frequency of MVTI was examined by several variables that describe the pre-injury, injury and post-injury phases (Haddon, 1980). Specifically, patterns of MVTI among males and females were described by time (year, month, day of the week, and time of day), location of injury (where the injury occurred), the circumstances of injury (activity under-taken during the event, breakdown event, and mechanism of injury), and the nature and anatomical site of the injury. Finally, emergency department disposition (outcome of emergency department visit) was used to describe the post-injury phase.

---

## Cautions and Caveats

Although a valuable tool, the CHIRPP database has limitations:

- The data are not representative of all regions of the country. CHIRPP was initially designed to be representative of ten pediatric hospitals in Canada, although five other hospitals were later included (Appendix 2). These hospitals are not uniformly distributed across the country and do not record all cases of injuries treated in emergency rooms in Canada. There may be an under/over-representation of such cases from hospital to hospital.
- CHIRPP forms may not be completed for all serious injuries because it is neither the parents nor physician's priority at the time of admittance.
- Older children (ages 15-19) may not always be treated at participating pediatric hospitals, but may be admitted into a general emergency department instead. Thus this age group may be under represented in the data.
- Cases of violence, abuse, neglect and suicide may be under-reported as patients and families may not readily disclose information about such causes.
- Causes of injury in public health records are uniformly classified and analyzed according to external causes (E codes) in the International Classification of Diseases (ICD-9) (WHO, 1977). CHIRPP data does not provide for any correspondence between its coding variables (in which several variables are utilized to describe the circumstances in which an injury occurred) and the standard ICD-9 coding system (one variable per case of injury).
- Coding errors and inconsistencies in coding from individual to individual and across the participating hospitals lead to further limitations when using CHIRPP data.

# B. RESULTS

## 1. MORTALITY DATA FROM THE BC VITAL STATISTICS AGENCY

### Mortality Rates by Age and Gender

The age-specific mortality rates per 100,000 as well as the total number of deaths from 1995 to 1998 are presented in Table 1.1 and Figure 1.1. Mortality due to MVTI was significantly higher among males than among females across most age groups. Among males, individuals in age groups 15-19, 20-24, and 80-84 have a comparatively higher mortality due to MVTI than the other age groups. Among females, individuals in age group 15-19 have significantly higher rates of MVTI death than younger age groups (See Appendix 6 for 95% CI).

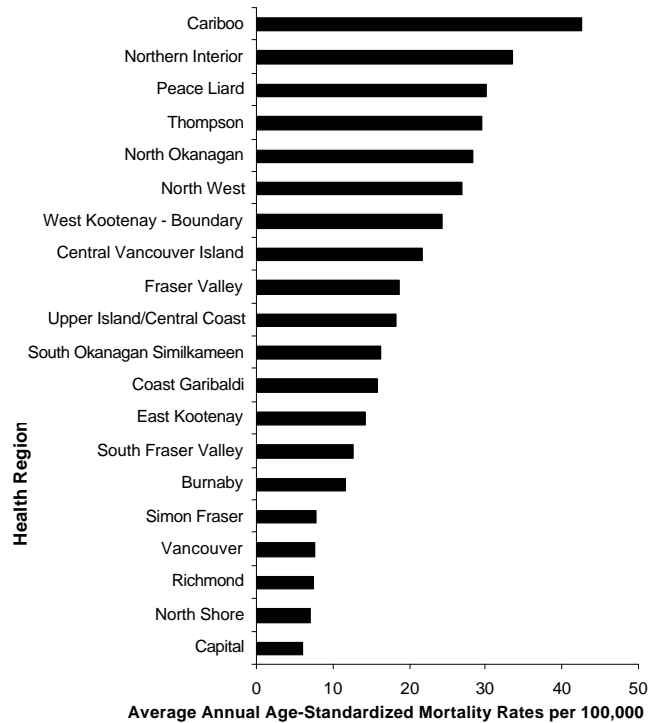
Figure 1.1: Average Annual Age-Specific Mortality Rates, 1995-1998, BC per 100,000 by Age



### Mortality Rates by Health Region

Figure 1.2 presents the average annual age-standardized mortality rates per 100,000 for males, by health region. There is a higher mortality due to MVTI for males in Cariboo (42.56 per 100,000) and Northern Interior (33.46 per 100,000) than in North Shore (7.01 per 100,000) and Capital (5.95 per 100,000).

Figure 1.2: Average Annual Age-Standardized Mortality Rates, 1995-1998, BC, per 100,000, Males, by Health Region.

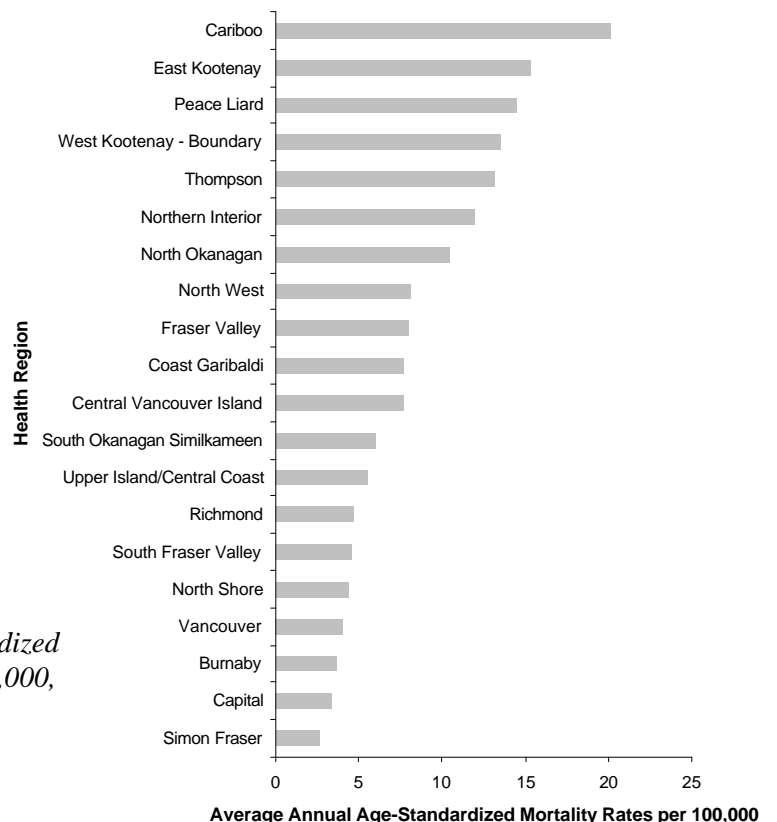


| AGE GROUP    | MALES          |                        | FEMALES        |                        |
|--------------|----------------|------------------------|----------------|------------------------|
|              | Mortality Rate | Total Number of Deaths | Mortality Rate | Total Number of Deaths |
| < 1          | 2.09           | 2                      | 3.35           | 3                      |
| 1-4          | 1.50           | 6                      | 2.38           | 9                      |
| 5-9          | 2.70           | 14                     | 1.83           | 9                      |
| 10-14        | 3.95           | 21                     | 2.00           | 10                     |
| 15-19        | 27.96          | 147                    | 14.61          | 72                     |
| 20-24        | 36.82          | 195                    | 9.59           | 49                     |
| 25-29        | 19.77          | 118                    | 4.68           | 27                     |
| 30-34        | 19.09          | 128                    | 6.72           | 44                     |
| 35-39        | 13.19          | 91                     | 4.81           | 33                     |
| 40-44        | 13.49          | 87                     | 4.28           | 28                     |
| 45-49        | 14.56          | 85                     | 4.36           | 25                     |
| 50-54        | 10.26          | 47                     | 4.42           | 20                     |
| 55-59        | 13.97          | 49                     | 5.67           | 23                     |
| 60-64        | 10.10          | 32                     | 4.47           | 14                     |
| 65-69        | 10.27          | 30                     | 6.93           | 21                     |
| 70-74        | 10.94          | 26                     | 10.17          | 29                     |
| 75-79        | 15.44          | 26                     | 11.33          | 26                     |
| 80-84        | 35.06          | 36                     | 12.45          | 20                     |
| 85+          | 35.73          | 23                     | 15.55          | 20                     |
| <b>Total</b> | <b>14.96</b>   | <b>1163</b>            | <b>6.15</b>    | <b>482</b>             |

Table 1.1: Average Annual Age-Specific Mortality Rates, 1995-98, BC, per 100,000 and Number of Deaths, by Age Group and Gender

Figure 1.3 presents the average annual age-standardized mortality rates for females, 1995-1998 per 100,000 by health region. Mortality due to MVTI is higher among females in Cariboo (20.14 per 100,000), East Kootenay (15.31 per 100,000) and Peace Liard (14.48 per 100,000) than for females in Simon Fraser (2.61 per 100,000), Capital (3.34 per 100,000) and Burnaby (3.69 per 100,000).

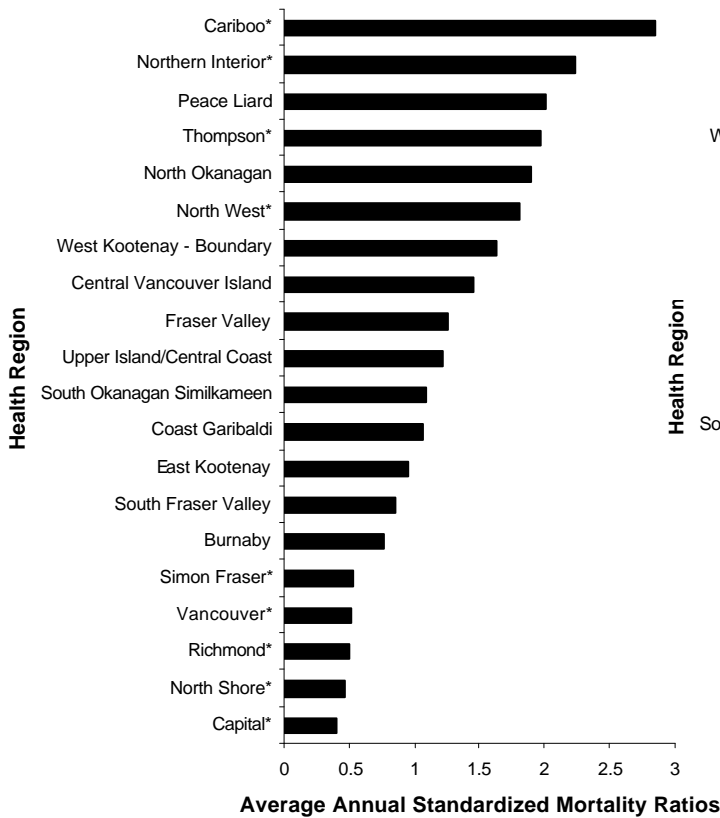
Figure 1.3: Average Annual Age-Standardized Mortality Rates, 1995-1998, BC, per 100,000, Females, by Health Region.



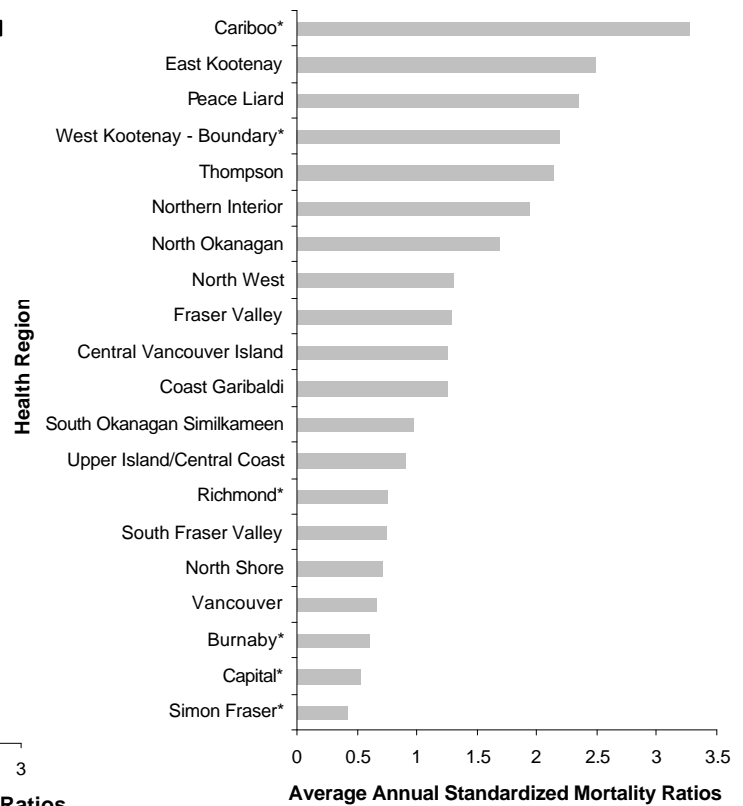
**Figure 1.4** shows that compared to the provincial rate, the highest SMR for MVTI among males was found in the Cariboo Health Region with a significant SMR of 2.85. The next highest SMRs were found in the Northern Interior Region (2.24) and Peace Liard (2.01). The lowest SMRs were found in the Capital Region (0.40), North Shore (0.47), Richmond (0.50) and Vancouver (0.51).

**Figure 1.5** presents the Average Annual Standardized Mortality Ratios, for Females by Health Region. The highest SMR among females was also found in Cariboo Health Region (3.27), followed by East Kootenay (2.49) and Peace Liard (2.35). The lowest SMRs were found in Simon Fraser (0.42), Capital (0.54) and Burnaby (0.60).

*Figure 1.4: Average Annual Standardized Mortality Ratios, 1995-1998, BC, Males, by Health Region.*



*Figure 1.5: Average Annual Standardized Mortality Ratios, 1995-1998, BC, Females, by Health Region*



\*Indicates statistical significance; See Appendix 6 for 95%CI.

## Mortality Rates by External Cause of Injury

Table 1.2, Figures 1.6 and 1.7 show the leading cause of injury for MVTI. For males, MVA without collision was the leading cause of death (4.19 per 100,000) followed by Two-MV collisions (3.95 per 100,000). For females, MVA caused by a Two-MV collision was the leading cause of death (2.11 per 100,000) followed by MVA of unspecified cause and MVA without collision on highway (1.34 and 1.32 per 100,000, respectively). It is worth noting that there is a high rate of MVA of unspecified cause.

Figure 1.7: Average Annual Age Standardized Mortality Rates 1995-1998, BC, per 100,000, Females, by External Cause of Injury

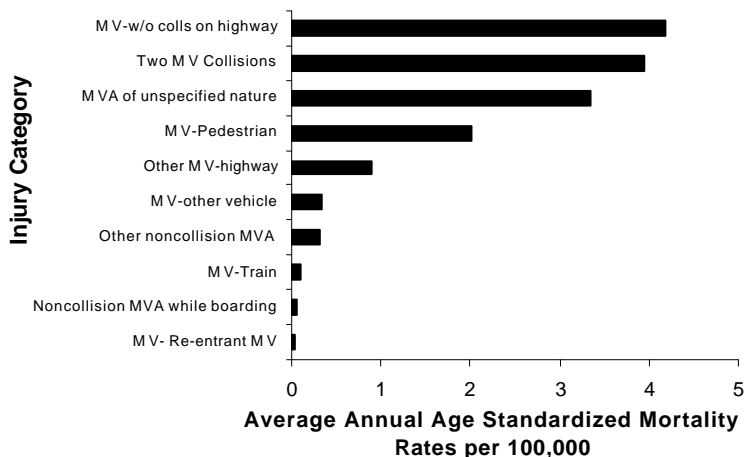
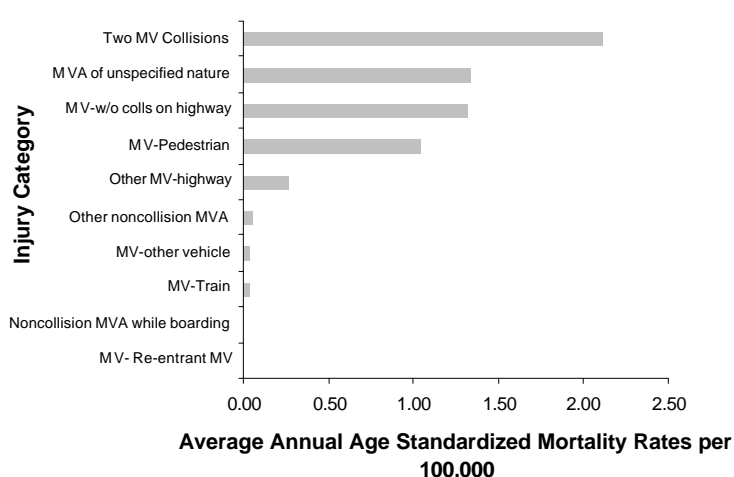


Figure 1.6: Average Annual Age Standardized Mortality Rates 1995-1998, BC, per 100,000, Males, by External Cause of Injury



| INJURY CATEGORY                  | MALES          |                     | FEMALES        |                     |
|----------------------------------|----------------|---------------------|----------------|---------------------|
|                                  | Mortality Rate | Total No. of Deaths | Mortality Rate | Total No. of Deaths |
| MV-Train                         | .09            | 7                   | .04            | 3                   |
| MV- Re-entrant MV                | .03            | 2                   | .00            | 0                   |
| Two MV Collisions                | 3.95           | 301                 | 2.11           | 166                 |
| MV-other vehicle                 | .33            | 26                  | .04            | 3                   |
| MV-Pedestrian                    | 2.01           | 156                 | 1.05           | 81                  |
| Other MV-highway                 | .89            | 69                  | .27            | 21                  |
| MV-w/o colls on highway          | 4.19           | 318                 | 1.32           | 102                 |
| Noncollision MVTI while boarding | .05            | 4                   | .00            | 0                   |
| Other noncollision MVTI          | .32            | 25                  | .06            | 5                   |
| MVTI of unspecified nature       | 3.35           | 255                 | 1.34           | 101                 |

Table 1.2: Average Annual Age-Standardized Mortality Rates 1995-98, BC, per 100,000, by External cause of Injury and Gender

Figures 1.8 and 1.9 show the age standardized mortality rates for the leading MVTI categories by health region, for both males and females. Among males, the highest peaks for MVA without collisions on highway and Two-MV collisions were both observed in Cariboo (17 per 100,000 and 13 per 100,000 respectively). The peak for MV – pedestrian was observed in the North West, Peace Liard, Burnaby and Thompson Health Regions, all with an age standardized rate of approximately 5 per 100,000.

For females, the highest peaks for Two-MV collisions were observed in Peace Liard (14 per 100,000) and Cariboo (7 per 100,000). A peak for MVA without collisions was observed in Cariboo (6 per 100,000). A similar rate was observed for MV– pedestrian in Coast Garibaldi (6 per 100,000).

Figure 1.8: Average Annual Age Standardized Mortality Rates, 1995-1998, BC, per 100,000, Males, by Leading MVTI Categories and Health Region

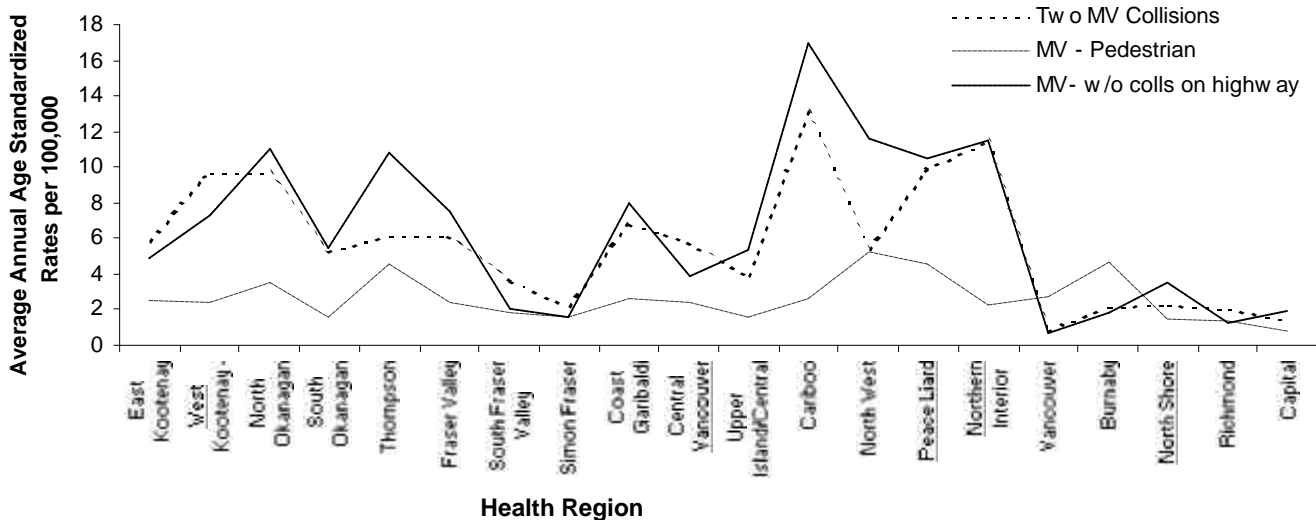
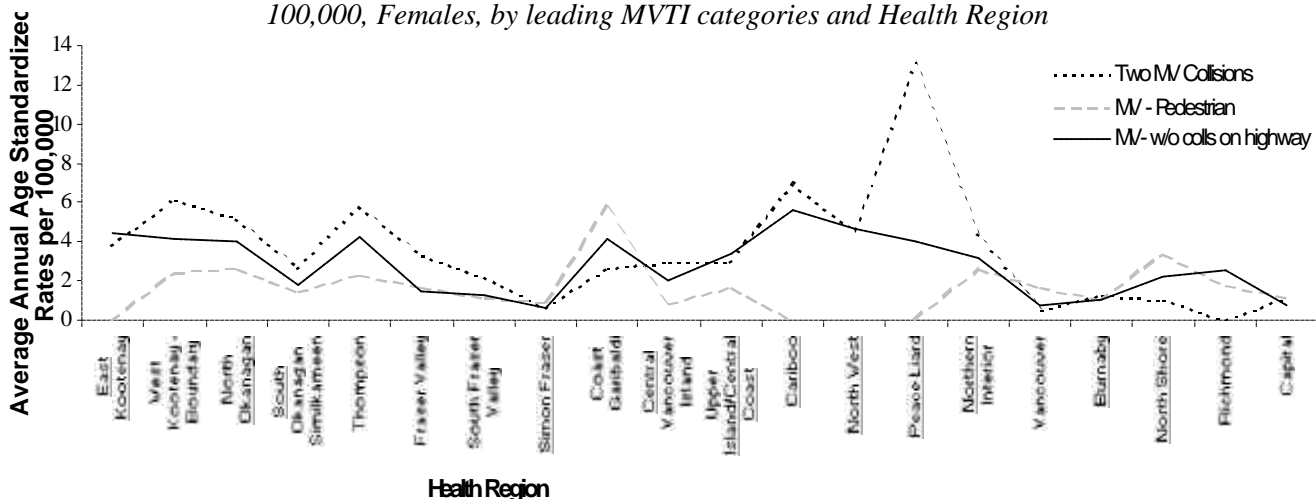


Figure 1.9: Average Annual Age Standardized Mortality Rates, 1995-1998, BC, per 100,000, Females, by leading MVTI categories and Health Region

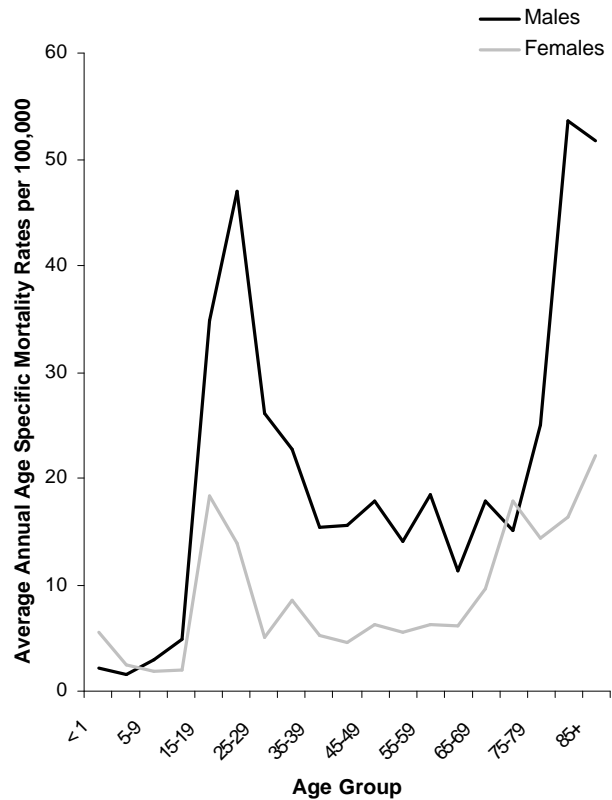


## 2. MORTALITY DATA FROM THE BC CORONER'S OFFICE

Figure 2.1: Average Annual Age Specific Mortality Rates 1995-1998, BC, per 100,000, by Age Group and Gender.

### Mortality Rates by Age and Gender

Table 2.1 and Figure 2.1 show the mortality rates by age and gender. The data displays a similar pattern to that of the mortality data from BC Vital Statistics Agency. Mortality due to MVTI was significantly higher among males than among females across most age groups. More specifically, males in age groups 15-19, 20-24, and 80-84 have a higher mortality due to MVTI than females (See Appendix 6 for 95% CI).



| Age Group    | Males          |                        | Females        |                        |
|--------------|----------------|------------------------|----------------|------------------------|
|              | Mortality Rate | Total Number of Deaths | Mortality Rate | Total Number of Deaths |
| < 1          | 2.09           | 2                      | 5.55           | 5                      |
| 1-4          | 1.50           | 6                      | 2.38           | 9                      |
| 5-9          | 2.89           | 15                     | 1.83           | 9                      |
| 10-14        | 4.92           | 26                     | 2.01           | 10                     |
| 15-19        | 34.87          | 183                    | 18.30          | 90                     |
| 20-24        | 47.02          | 249                    | 13.90          | 71                     |
| 25-29        | 26.11          | 156                    | 5.02           | 29                     |
| 30-34        | 22.68          | 152                    | 8.57           | 56                     |
| 35-39        | 15.42          | 106                    | 5.24           | 36                     |
| 40-44        | 15.65          | 101                    | 4.60           | 30                     |
| 45-49        | 17.80          | 104                    | 6.24           | 36                     |
| 50-54        | 13.98          | 64                     | 5.51           | 25                     |
| 55-59        | 18.49          | 65                     | 6.24           | 22                     |
| 60-64        | 11.36          | 36                     | 6.06           | 19                     |
| 65-69        | 17.79          | 52                     | 9.58           | 29                     |
| 70-74        | 15.15          | 36                     | 17.89          | 51                     |
| 75-79        | 25.01          | 42                     | 14.34          | 33                     |
| 80-84        | 53.56          | 55                     | 16.28          | 26                     |
| 85+          | 51.83          | 33                     | 22.15          | 29                     |
| <b>Total</b> | <b>19.08</b>   | <b>1483</b>            | <b>7.85</b>    | <b>615</b>             |

Table 2.1: Average Annual Age-Specific Mortality Rates 1995-98, BC, per 100,000 and Number of Deaths, by Age Group and Gender.

## Mortality Rates by Health Region

Figure 2.2 shows that high age standardized mortality rates due to MVTI for males were found in Thompson (66.22 per 100,000), Peace Liard (56.95 per 100,000), Cariboo (49.43 per 100,000) and Northern Interior (45.87 per 100,000). Lower rates were found in southern regions including North Shore (3.22 per 100,000), Capital (4.69 per 100,000), Richmond (6.49 per 100,000), and Simon Fraser (6.53 per 100,000). This pattern is similar to the one found in the mortality data from the BC Statistics Agency.

Figure 2.2: Average Annual Age Standardized Mortality Rates per 1995-1998, BC, 100,000, Males, by Health Region. BC Coroner's Data.

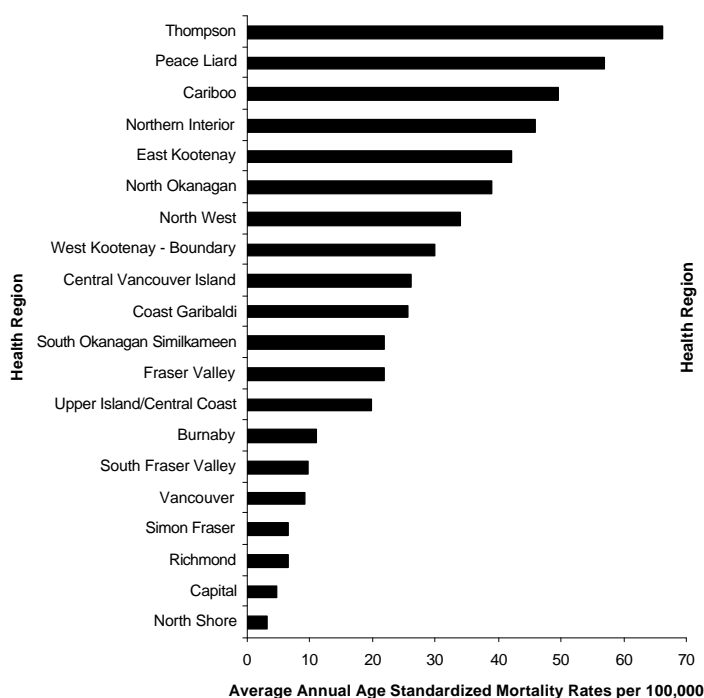
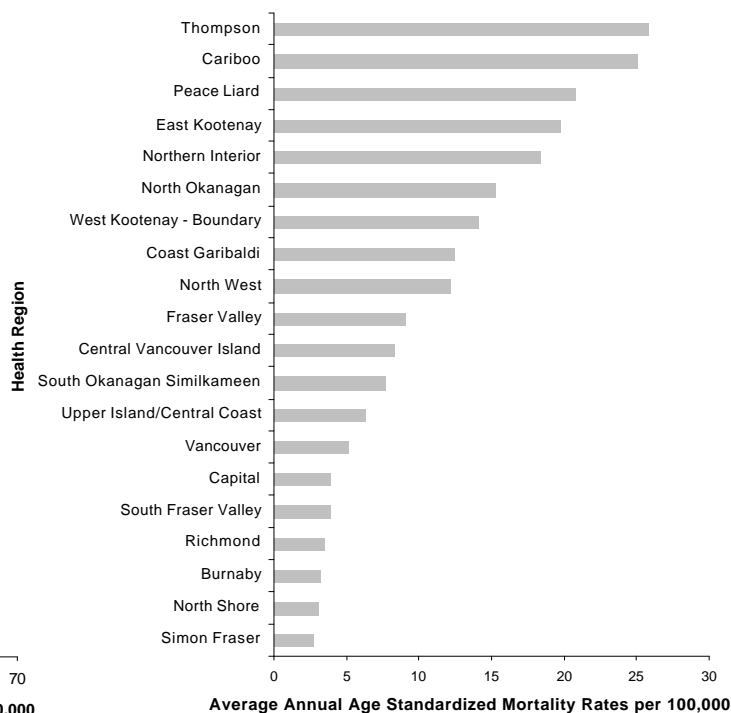


Figure 2.3 shows the Average Annual Age Standardized Mortality Rates per 100,000 for females. Mortality due to MVTI is high among females in the northern and north-east health regions. The highest rates were found in Thompson (25.82 per 100,000) and Cariboo (25.04 per 100,000). The lowest rates for females were found in North Shore (3.01 per 100,000) and Richmond (3.44 per 100,000).

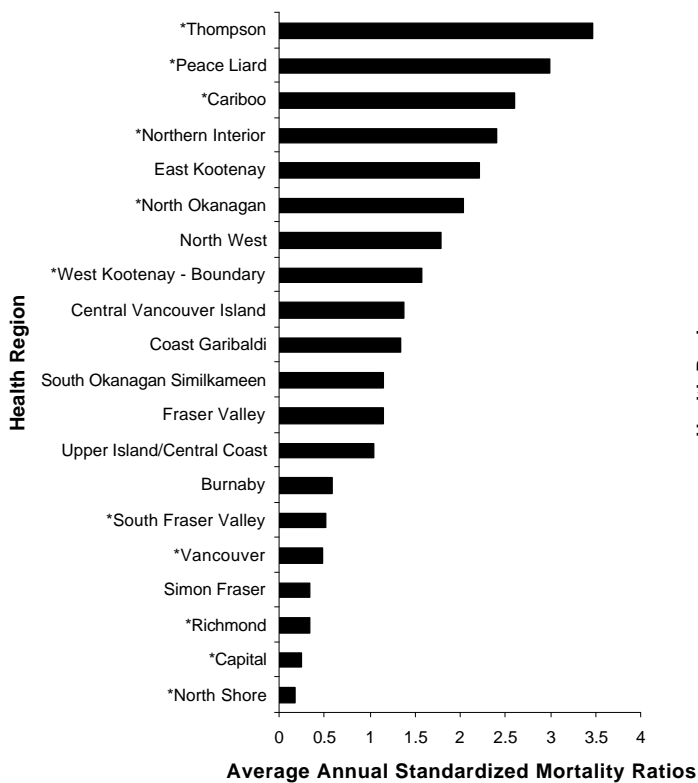
Figure 2.3: Average Annual Age Standardized Mortality Rates, 1995-1998, BC, per 100,000, Females, by Health Region. BC Coroner's Data.



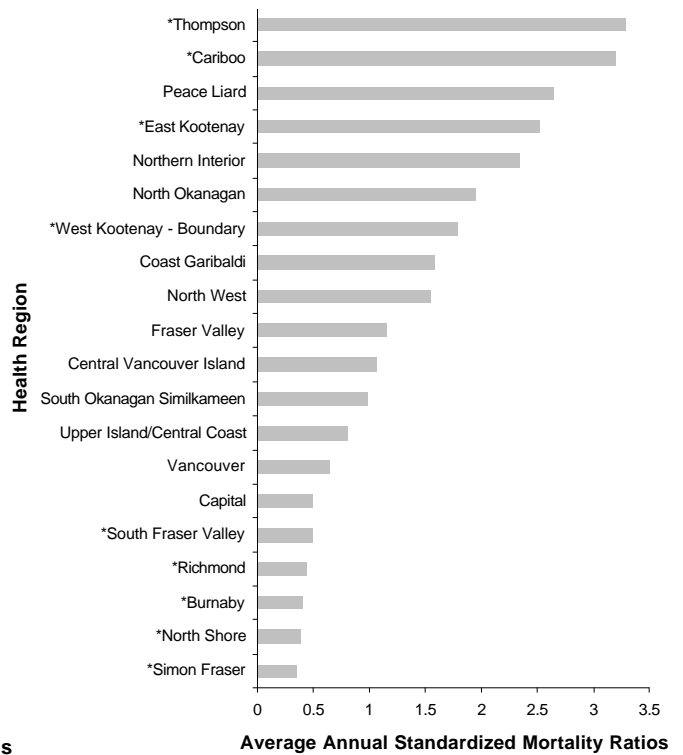
**Figure 2.4 shows the standardized mortality ratios by Health Region among males.** Compared to the provincial rate, the highest mortality rate for MVTI among males was found in the Thompson Health Region with a significant SMR of 3.48. The next highest SMRs were found in the Peace Liard (2.99), Cariboo (2.60), Northern Interior (2.41), and North Okanagan (2.04). The lowest SMRs were found in the North Shore (0.17) and Capital (0.25) Regions (See Appendix 6 for 95%CI).

The highest **SMR among females** was also found in Thompson Health Region (3.30), followed by Cariboo (3.20), Peace Liard (2.65) and East Kootenay (2.52) Regions. The lowest SMRs were found in Simon Fraser (0.35), North Shore (0.38) and Burnaby (0.40). (See *figure 2.5*)

*Figure 2.4: Average Annual Standardized Mortality Ratios, 1995-1998, BC, Males, by Health Region. BC Coroner's Data.*



*Figure 2.5: Average Annual Standardized Mortality Ratios, 1995-1998, BC, Females, by Health Region. BC Coroner's Data.*



*\*Indicates statistical significance; See Appendix 6 for 95%CI.*

## Victim of Death by Policing Jurisdiction

Table 2.2 shows the categories of victims of death by policing jurisdictions. There are more pedal cyclists and pedestrian deaths in Greater Victoria/Greater Vancouver than in Northern Jurisdictions (about 3 to 4 times more than in the Northern regions) ( $p < 0.05$ ). Conversely, there are more driver and passenger deaths occurring in the Northern, Southeast and Southwest jurisdictions than in Greater Victoria and Greater Vancouver (77% vs. 23%) ( $p < 0.05$ ).

## Contributing Factors to Death by Policing Jurisdiction

Table 2.3 shows the contributing factors involved in the MVTI death by policing jurisdiction. The majority of the deaths involved alcohol (90 percent of the cases). Out of these alcohol-related deaths, about 32 percent occurred in the Northern Jurisdictions, 40 percent in Southeast, 27 percent in Southwest and 31 percent in Greater Victoria and Greater Vancouver. Finally, the Southwest and Greater Vancouver and Victoria tend to have higher proportions of a combination of alcohol and drugs involved ( $p < 0.05$ ).

| Policing Jurisdiction                  | Victim of Death         |                            |                |                        |                |                    |                 |                         | Total      |
|--|-------------------------|----------------------------|----------------|------------------------|----------------|--------------------|-----------------|-------------------------|------------|
|  | MVA: Comm. Truck Driver | MVA: Comm. Truck Passenger | MVA: Driver    | MVA: Motorcycle, Moped | MVA: Passenger | MVA: Pedal Cyclist | MVA: Pedestrian | MVA: Train <sup>6</sup> |            |
| Northern                               | 21<br>(5.2%)            | 2<br>(.5%)                 | 202<br>(49.6%) | 8<br>(2.0%)            | 140<br>(34.4%) | 5<br>(1.2%)        | 27<br>(6.6%)    | 2<br>(.5%)              | 407 (100%) |
| Southeast                              | 12<br>(2.2%)            | 2<br>(.4%)                 | 295<br>(52.9%) | 32<br>(5.7%)           | 170<br>(30.5%) | 5<br>(.9%)         | 41<br>(7.3%)    | 1<br>(.2%)              | 558 (100%) |
| Southwest                              | 6<br>(1.9%)             | 0                          | 159<br>(50.3%) | 21<br>(6.6%)           | 88<br>(27.8%)  | 6<br>(1.9%)        | 34<br>(10.8%)   | 2<br>(.6%)              | 316 (100%) |
| Greater Vancouver/<br>Greater Victoria | 0                       | 0                          | 187<br>(35.5%) | 33<br>(6.3%)           | 134<br>(25.4%) | 17<br>(3.2%)       | 155<br>(29.4%)  | 1<br>(.2%)              | 527 (100%) |

Table 2.2 Victim of Death by Policing Jurisdiction 1995-1998. BC Coroner's Data.

| Policing Jurisdiction                     | Contributing Factors |                          |                |                        |                   |                 |            |               |            |                      | Total       |               |
|---|----------------------|--------------------------|----------------|------------------------|-------------------|-----------------|------------|---------------|------------|----------------------|-------------|---------------|
|   | Airway Obstruction   | Alcohol/ Drugs: Involved | Alcohol: Acute | Alcohol: Chronic Abuse | Alcohol: Involved | Drugs: Involved | Fall       | Fire: Vehicle | MVA: Train | Police: Auto-Pursuit |             | Submersion    |
| Northern                                  | 2<br>(1.2%)          | 3<br>(1.8%)              | 27<br>(15.8%)  | 2<br>(1.2%)            | 126<br>(73.7%)    | 2<br>(1.2%)     | 1<br>(.6%) | 4<br>(2.3%)   | 0          | 1<br>(.6%)           | 3<br>(1.8%) | 171<br>(100%) |
| Southeast                                 | 0                    | 8<br>(3.7%)              | 35<br>(16.1%)  | 0                      | 155<br>(71.4%)    | 6<br>(2.8%)     | 0          | 5<br>(2.3%)   | 2<br>(.9%) | 0                    | 6<br>(2.8%) | 217<br>(100%) |
| Southwest                                 | 1<br>(.8%)           | 12<br>(8.1%)             | 23<br>(15.4%)  | 0                      | 95<br>(63.8%)     | 4<br>(2.7%)     | 1<br>(.7%) | 4<br>(2.7%)   | 1<br>(.7%) | 1<br>(.7%)           | 7<br>(4.7%) | 149<br>(100%) |
| Greater Vancouver<br>and Greater Victoria | 0                    | 13<br>(7.5%)             | 41<br>(23.7%)  | 1<br>(.6%)             | 98<br>(56.6%)     | 6<br>(3.5%)     | 1<br>(.6%) | 2<br>(1.2%)   | 0          | 7<br>(4.0%)          | 4<br>(2.3%) | 173<br>(100%) |

Table 2.3 Contributing Factors by Policing Jurisdiction 1995-1998. BC Coroner's Data.

<sup>6</sup> The victim of death is not specified in the MVA/Train category of collision

## Alcohol Involvement

*Table 2.4* shows the distribution of cases where alcohol was involved in the MVTI. About 5% of male and female drivers were exposed to a combination of alcohol and drugs.

Among males, acute alcohol intoxication was found in 22% of the drivers ( $p < 0.05$ ). Alcohol was present in about 73 percent of drivers, 71 percent of motorcyclists, 81 percent of passengers, and 56 percent of pedestrians.

Among females, acute alcohol intoxication was found in 19% of the drivers ( $p > 0.05$ ). Alcohol was present in about 74 percent of drivers, 92 percent of passengers, 72 percent of pedestrians, and all 4 female motorcyclists that were recorded in this database.

| SEX     | Alcohol Involvement            |                           |                              |                      | Total    |             |            |
|---------|--------------------------------|---------------------------|------------------------------|----------------------|----------|-------------|------------|
|         | Alcohol/<br>Drugs:<br>Involved | Alcohol:<br>Acute         | Alcohol:<br>Chronic<br>Abuse | Alcohol:<br>Involved |          |             |            |
| Males   | Victim of<br>Death             | MVA: Driver               | 17 (5.4%)                    | 69 (21.8%)           | 1 (.3%)  | 229 (72.5%) | 316 (100%) |
|         |                                | MVA: Motorcycle,<br>Moped | 1 (3.2%)                     | 8 (25.8%)            | 0        | 22 (71.0%)  | 31 (100%)  |
|         |                                | MVA: Passenger            | 8 (6.25%)                    | 16 (12.5%)           | 0        | 104 (81.3%) | 128 (100%) |
|         |                                | MVA: Pedal<br>Cyclist     | 1 (14.3%)                    | 0                    | 0        | 6 (85.7%)   | 7 (100%)   |
|         |                                | MVA: Pedestrian           | 3 (0.1%)                     | 22 (37.3%)           | 1 (1.7%) | 33 (55.9%)  | 59 (100%)  |
| Females | Victim of<br>death             | MVA: Driver               | 3 (5.7%)                     | 10 (18.9%)           | 1 (1.9%) | 39 (73.6%)  | 53 (100%)  |
|         |                                | MVA: Motorcycle,<br>Moped | 0                            | 0                    | 0        | 4 (100%)    | 4 (100%)   |
|         |                                | MVA: Passenger            | 4 (8.2%)                     | 0                    | 0        | 45 (91.8%)  | 49 (100%)  |
|         |                                | MVA: Pedestrian           | 1 (5.6%)                     | 4 (22.2%)            | 0        | 13 (72.2%)  | 18 (100%)  |

*Table 2.4: Victim of Death by Alcohol Involvement and Gender, 1995-1998. BC Coroner's Data*

## Victim of Death and Legal Alcohol Impairment

**Table 2.5 shows the distribution of the cases by legal impairment status.** When a person is classified as being legally impaired, this means that he/she has a blood alcohol reading of 0.08% or more.

For males, about 41 percent of the drivers were legally impaired. Similarly, 27 percent of motorcyclists, 30 percent of passengers, 14 percent of pedal cyclists and 31 percent of pedestrians were legally impaired ( $p < 0.01$ ).

For females, about 20 percent of the drivers were legally impaired. 11 percent of motorcyclists, 12 percent of passengers and 16 percent of pedestrians were legally impaired ( $p > 0.05$ ).

**Table 2.6 shows the legal status of blood alcohol level for all the victims by policing jurisdictions.** Similar proportions of legally impaired cases were found across the jurisdictions. Northern, Southeast, Southwest, and Greater Vancouver/Greater Victoria jurisdictions had respectively 32 percent, 29 percent, 34 percent, and 23 percent of the deaths classified as legally impaired ( $p > 0.05$ ).

*Table 2.5 Legal Status of Blood Alcohol Level By Victim of Death and Gender, 1995-1998, BC Coroner's Data*

| SEX     | Victim of Death | MVA: Driver            | Legal Status     |                      | Total           |
|---------|-----------------|------------------------|------------------|----------------------|-----------------|
|         |                 |                        | Legally impaired | Not legally impaired |                 |
| Males   | Victim of Death | MVA: Driver            | 283<br>(40.7%)   | 413<br>(59.3%)       | 696<br>(100.0%) |
|         |                 | MVA: Motorcycle, Moped | 23<br>(26.7%)    | 63<br>(73.3%)        | 86<br>(100.0%)  |
|         |                 | MVA: Passenger         | 95<br>(30.2%)    | 220<br>(69.8%)       | 315<br>(100.0%) |
|         |                 | MVA: Pedal Cyclist     | 4<br>(14.3%)     | 24<br>(85.7%)        | 28<br>(100.0%)  |
|         |                 | MVA: Pedestrian        | 51<br>(30.5%)    | 116<br>(69.5%)       | 167<br>(100.0%) |
| Females | Victim of Death | MVA: Driver            | 38<br>(19.6%)    | 156<br>(80.4%)       | 194<br>(100.0%) |
|         |                 | MVA: Motorcycle, Moped | 1<br>(11.1%)     | 8<br>(88.9%)         | 9<br>(100.0%)   |
|         |                 | MVA: Passenger         | 30<br>(11.6%)    | 229<br>(88.4%)       | 259<br>(100.0%) |
|         |                 | MVA: Pedal Cyclist     | 0                | 5<br>(100.0%)        | 5<br>(100.0%)   |
|         |                 | MVA: Pedestrian        | 16<br>(15.8%)    | 85<br>(84.2%)        | 101<br>(100.0%) |

*Table 2.6: Legal Status of Blood Alcohol Level By Policing Jurisdictions, 1995-1998, BC Coroner's Data*

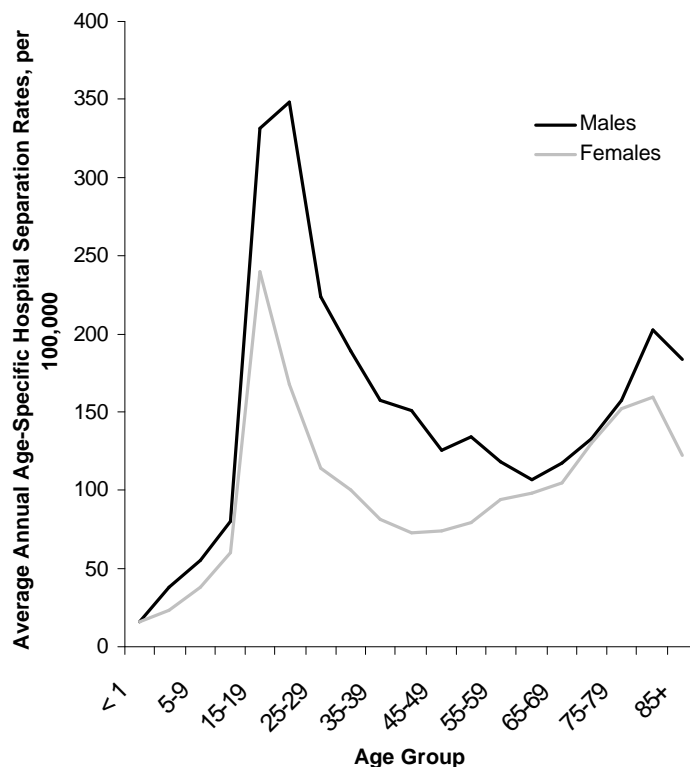
| Policing Jurisdiction |  | Legal Status     |                      | Total           |
|-----------------------|--|------------------|----------------------|-----------------|
|                       |  | legally impaired | not legally impaired |                 |
| Northern              |  | 135<br>(32.1%)   | 285<br>(67.9%)       | 420<br>(100.0%) |
|                       |  | 161<br>(28.6%)   | 401<br>(71.4%)       | 562<br>(100.0%) |
|                       |  | 109<br>(34.1%)   | 211<br>(65.9%)       | 320<br>(100.0%) |
|                       |  | 122<br>(22.8%)   | 412<br>(77.2%)       | 534<br>(100.0%) |

### 3. NON-FATAL MTVI – HOSPITAL SEPARATIONS

#### Hospital Separation Rates by Age and Gender

Table 3.1 and Figure 3.2 present the age-specific hospital separation rates by age and gender. Injuries due to MVTI among males were significantly higher than among females across all age groups. Most MVTI injuries occurred for both males and females in age groups 15-19, 20-24, 25-29, 75-79, and 80-84 (See Appendix 6 for 95% CI).

Figure 3.1: Average Annual Age-Specific Hospital Separation Rates, 1995-1998, BC, per 100,000 by Age Group and Gender



| Age Group    | Males                    |                          | Females                  |                          |
|--------------|--------------------------|--------------------------|--------------------------|--------------------------|
|              | Hospital Separation Rate | Total Number of Injuries | Hospital Separation Rate | Total Number of Injuries |
| < 1          | 15.57                    | 15                       | 15.38                    | 14                       |
| 1-4          | 37.76                    | 151                      | 23.50                    | 89                       |
| 5-9          | 54.48                    | 282                      | 38.46                    | 190                      |
| 10-14        | 80.45                    | 426                      | 60.46                    | 303                      |
| 15-19        | 331.27                   | 1740                     | 239.52                   | 1183                     |
| 20-24        | 347.90                   | 1842                     | 167.33                   | 856                      |
| 25-29        | 223.33                   | 1334                     | 114.39                   | 660                      |
| 30-34        | 188.79                   | 1266                     | 100.50                   | 656                      |
| 35-39        | 157.27                   | 1087                     | 80.83                    | 555                      |
| 40-44        | 150.57                   | 972                      | 73.20                    | 474                      |
| 45-49        | 125.72                   | 737                      | 73.55                    | 425                      |
| 50-54        | 134.54                   | 609                      | 79.63                    | 359                      |
| 55-59        | 117.78                   | 419                      | 93.59                    | 333                      |
| 60-64        | 106.22                   | 337                      | 98.17                    | 308                      |
| 65-69        | 116.79                   | 341                      | 104.84                   | 318                      |
| 70-74        | 132.72                   | 314                      | 129.99                   | 371                      |
| 75-79        | 156.76                   | 260                      | 152.11                   | 349                      |
| 80-84        | 202.24                   | 208                      | 159.45                   | 256                      |
| 85+          | 183.27                   | 117                      | 122.80                   | 160                      |
| <b>Total</b> | <b>160.25</b>            | <b>12457</b>             | <b>100.28</b>            | <b>7859</b>              |

Table 3.1: Average Annual Age-Specific Hospital Separation Rates 1995-98, BC, per 100,000 and Number of Injuries, by Age Group and Gender

## Hospital Separation Rates by Health Region

Figure 3.2 shows the average annual age standardized hospital separation rates by health region among males. The Cariboo Health Region had the highest hospital separation rate for males (392.65 per 100,000). The next highest rates were found in Peace Liard (271.89 per 100,000) and Northern Interior (257.15 per 100,000). The lowest rates were seen in the North Shore (76.85 per 100,000) and Richmond (96.85 per 100,000).

Figure 3.2: Average Annual Age Standardized Hospital Separation Rates, 1995-1998, BC, per 100,000, Males, by Health Region

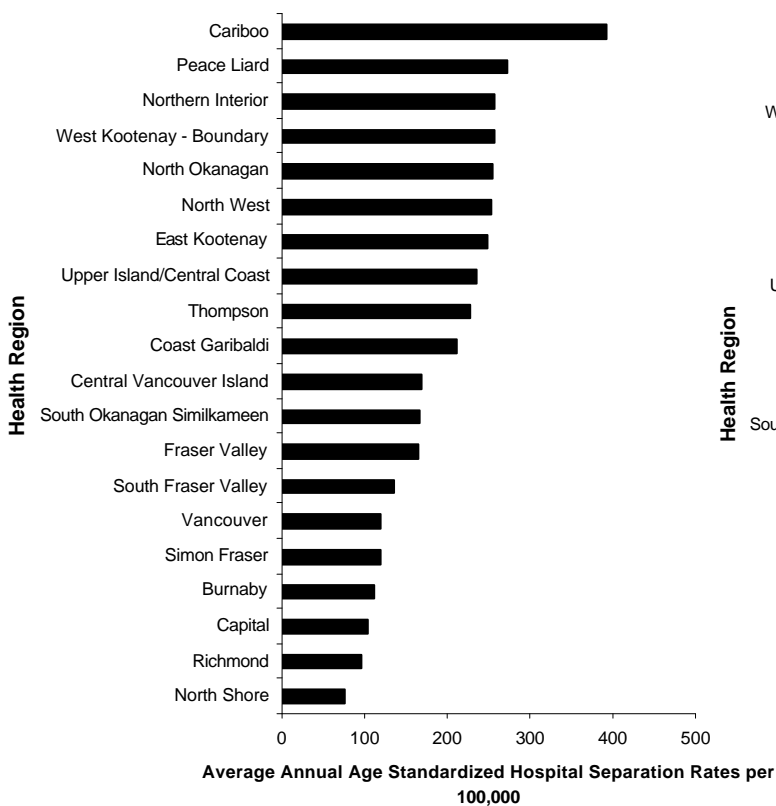
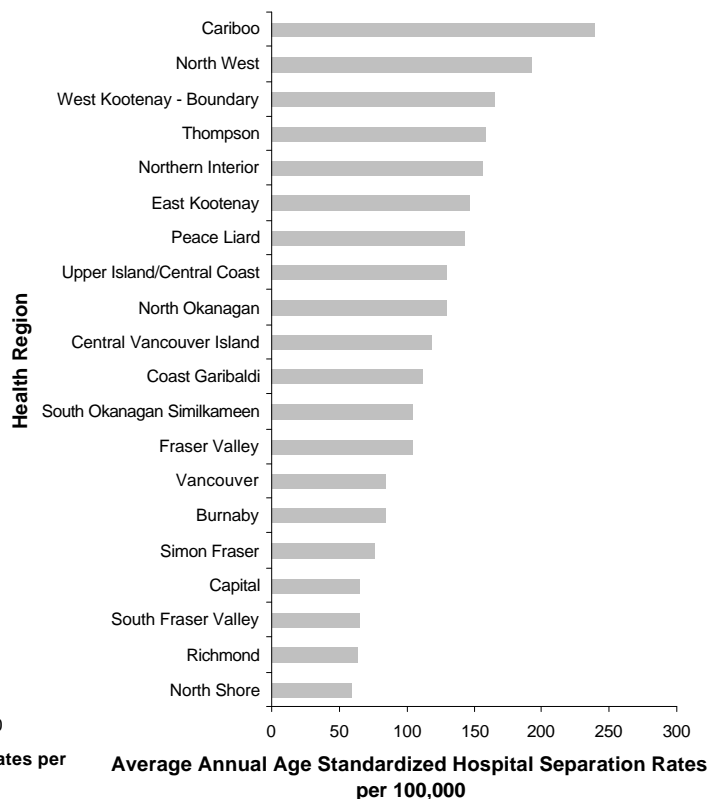


Figure 3.3 shows the average annual age standardized hospital separation rates by health region among females. Cariboo Health Region had the highest hospital separation rates for females (239.52 per 100,000). The next highest rates were found in North West and West Kootenay (192.23 and 165.29 per 100,000, respectively). The lowest separation rates for females were found in North Shore (58.76 per 100,000) and Richmond (63.91 per 100,000).

Figure 3.3: Average Annual Age Standardized Hospital Separation Rates, 1995-1998, BC, per 100,000 Females, by Health Region

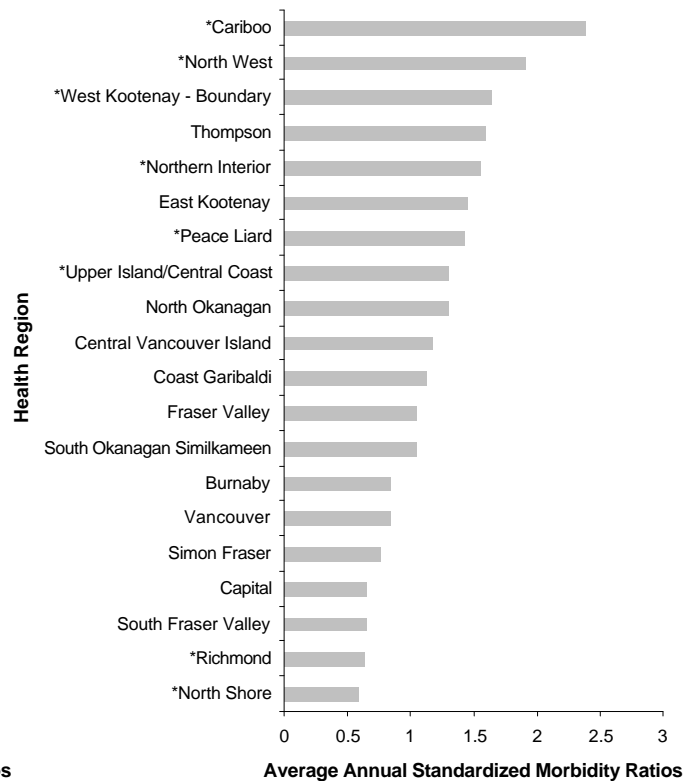
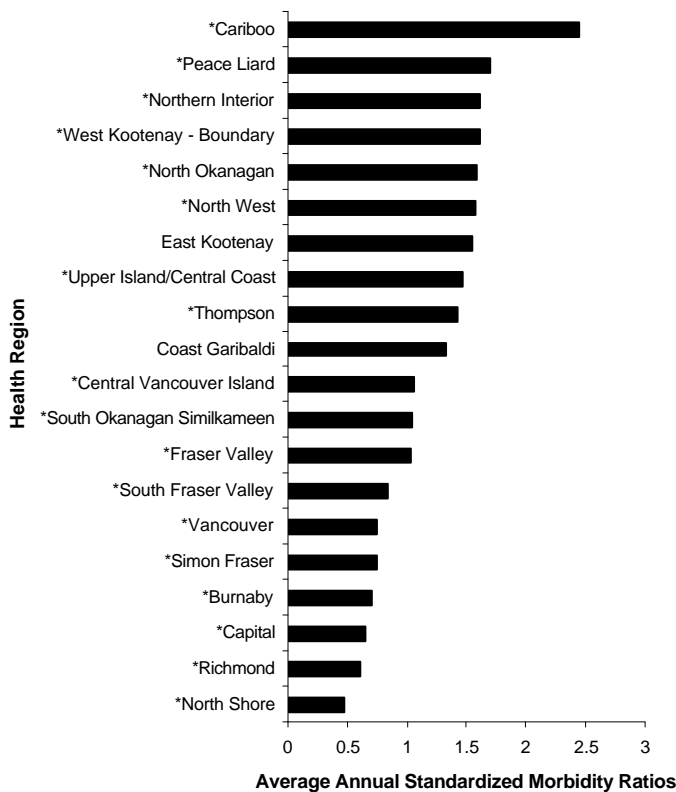


**Figure 3.4 shows the standardized morbidity ratios (SMRs) among males.** Significantly high SMRs were found in Cariboo (2.45), Peace Liard (1.70), West Kootenay – Boundary (1.61), Northern Interior (1.61), North Okanagan (1.59) and North West (1.58). Significantly low SMRs among males were found in North Shore (0.48), Richmond (0.61) and Capital (0.65) (See Appendix 6 for 95% CI).

**Figure 3.5 shows that the highest SMRs for females** were found in Cariboo Health Region (2.39), followed by North West (1.92), West Kootenay – Boundary (1.65) and Thompson (1.59). Significantly low SMRs were found in Capital (0.65), Richmond (0.64) and North Shore (0.59) and Richmond (0.61) (See Appendix 6 for 95% CI).

*Figure 3.4: Average Annual Standardized Morbidity Ratios, 1995-1998, BC, Males, by Health Region*

*Figure 3.5: Average Annual Standardized Morbidity Ratios, 1995-1998, BC, Females, by Health Region*



*\*Indicates statistical significance; See Appendix 6 for 95%CI.*

## Hospital Separation Rates by External Cause of Injury

Table 3.3 and Figures 3.6 and 3.7 show that the highest hospital separation rates due to MVTI for males were caused by MVA without collisions on highway (56.37 per 100,000), followed by Two-MV collisions

(47.94 per 100,000) and MV- pedestrian (19.54 per 100,000). For females, Two-MV collisions was the leading cause of injuries (37.39 per 100,000) followed by MVA without collisions on highway and MV-pedestrian (28.24 and 15.93 per 100,000, respectively).

Figure 3.6: Average Annual Age Standardized Hospital Separation Rates, 1995-1998, BC, per 100,000, Males, by External Cause of Injury

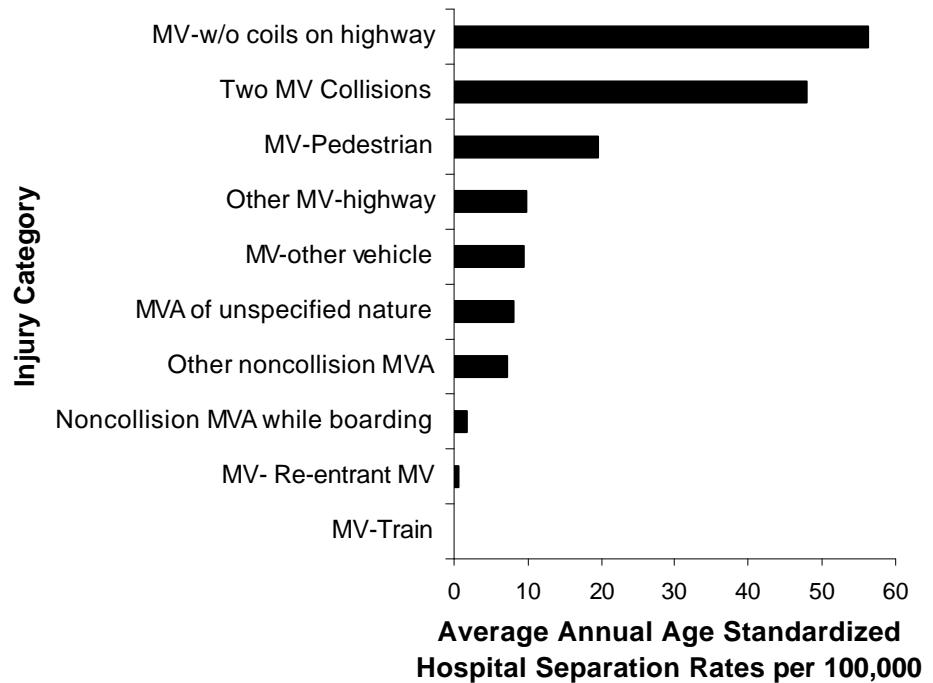
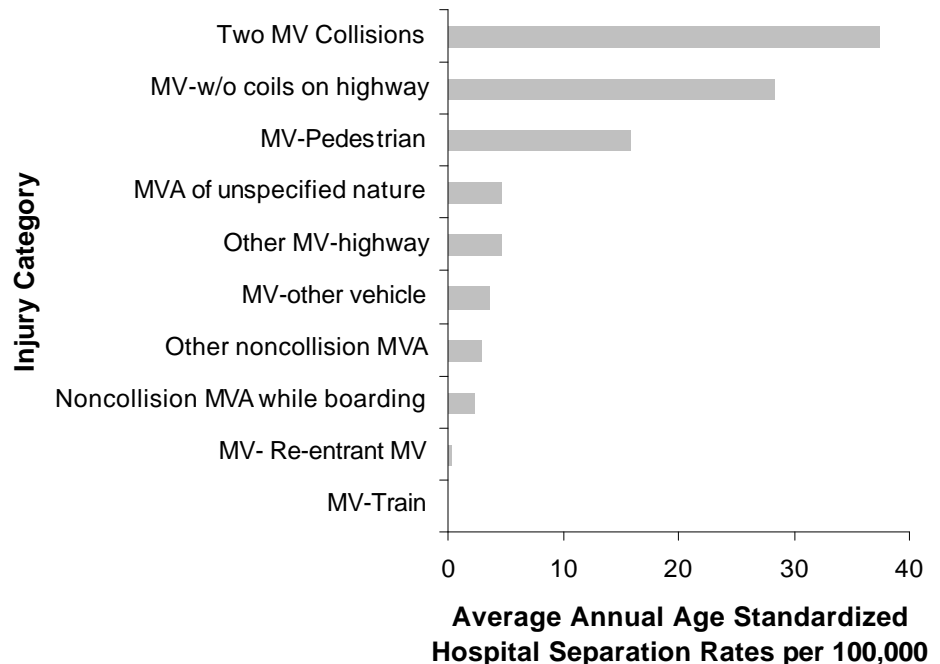


Figure 3.7: Average Annual Age Standardized Hospital Separation Rates 1995-1998, BC, per 100,000, Females, by External Cause of Injury



| Injury Category                  | Males                    |                          | Females                  |                          |
|----------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
|                                  | Hospital Separation Rate | Total Number of Injuries | Hospital Separation Rate | Total Number of Injuries |
| MV-Train                         | .21                      | 16                       | .10                      | 8                        |
| MV- Re-entrant MV                | .49                      | 38                       | .42                      | 33                       |
| Two MV Collisions                | 47.94                    | 3719                     | 37.39                    | 2930                     |
| MV-other vehicle                 | 9.46                     | 733                      | 3.61                     | 282                      |
| MV-Pedestrian                    | 19.54                    | 1519                     | 15.93                    | 1249                     |
| Other MV-highway                 | 9.77                     | 758                      | 4.65                     | 363                      |
| MV-w/o colls on highway          | 56.37                    | 4366                     | 28.24                    | 2206                     |
| Noncollision MVTI while boarding | 1.75                     | 136                      | 2.37                     | 186                      |
| Other noncollision MVTI          | 7.13                     | 554                      | 2.96                     | 231                      |
| MVTI of unspecified nature       | 7.97                     | 618                      | 4.75                     | 371                      |

*Table 3.3 Average Annual Age-Standardized Hospital Separation Rates 1995-98, BC, per 100,000, by External Cause of Injury and Gender*

Figures 3.8 and 3.9 show the age standardized hospital separation rates for the leading MVTI categories by health region, for males and females respectively. Among males, the highest rates were for MV-Occupant observed in Cariboo (283 per 100,000), Northern Interior (201 per 100,000), Peace Liard and North Okanagan (196 per 100,000), West Kootenay (195 per 100,000), NorthWest (186 per 100,000), and

East Kootenay (181 per 100,000) (See Appendix 6 for 95% CI).

For females, the highest rates were for MV-Occupant observed in Cariboo (206 per 100,000). The highest rate for MV-Pedestrian was observed in Vancouver (30 per 100,000) (See Appendix 6 for 95% CI).

Figure 3.8: Average Annual Age Standardized Hospital Separation Rates, 1995-1998, BC, per 100,000, Males, by Leading MVTI Categories and Health Region

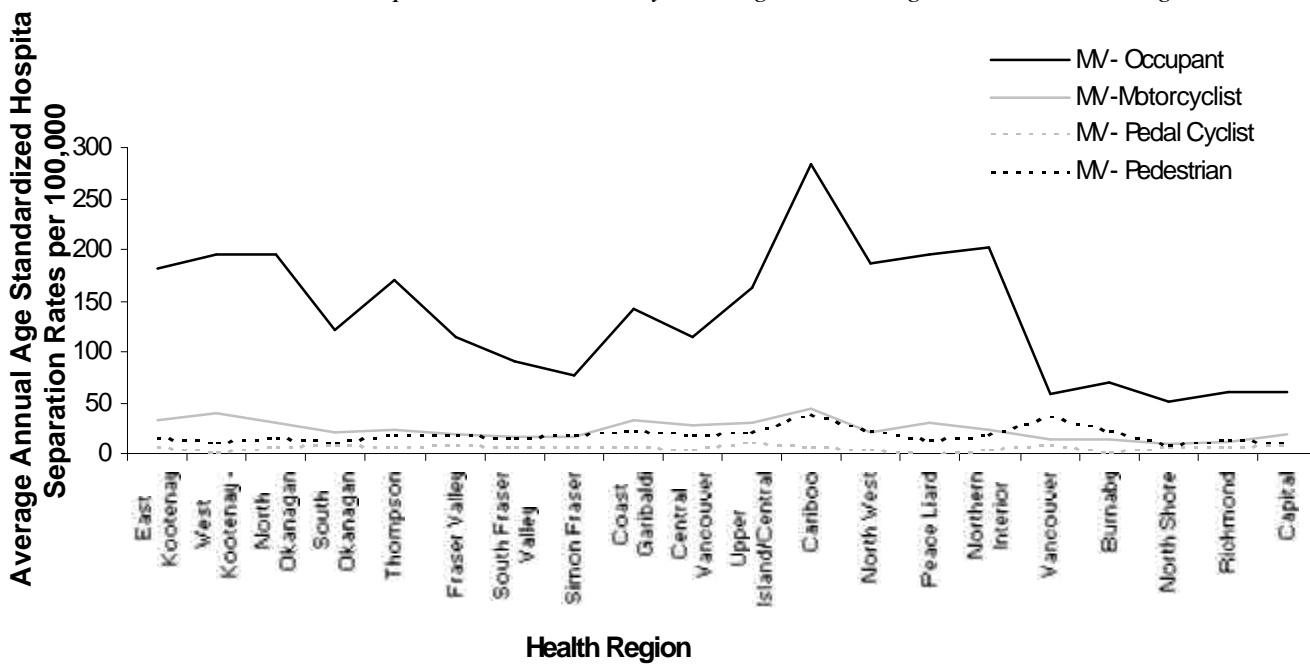
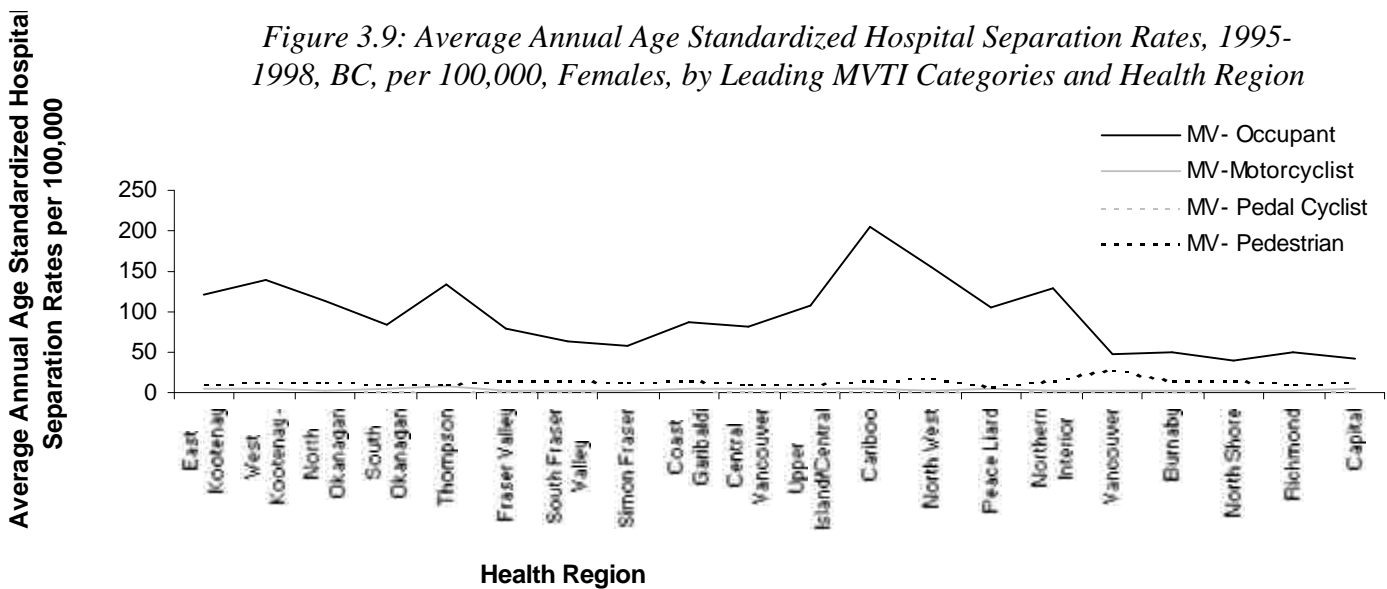


Figure 3.9: Average Annual Age Standardized Hospital Separation Rates, 1995-1998, BC, per 100,000, Females, by Leading MVTI Categories and Health Region



| Policing Jurisdiction |                                | Leading MVTI Categories |                |                  |                 | Total           |
|-----------------------|--------------------------------|-------------------------|----------------|------------------|-----------------|-----------------|
|                       |                                | MV-Occupant             | MV-Motorcycle  | MV-Pedal Cyclist | MV-Pedestrian   |                 |
| Northern              | Northern                       | 1884<br>(82.5%)         | 164<br>(7.2%)  | 35<br>(1.5%)     | 201<br>(8.8%)   | 2284<br>(100%)  |
|                       | Southeast                      | 2640<br>(80.0%)         | 329<br>(10.0%) | 79<br>(2.4%)     | 252<br>(7.6%)   | 3300<br>(100%)  |
|                       | Southwest                      | 2515<br>(79.0%)         | 295<br>(9.3%)  | 73<br>(2.3%)     | 300<br>(9.4%)   | 3183<br>(100%)  |
|                       | Greater Vancouver and Victoria | 7294<br>(67.4%)         | 1008<br>(9.3%) | 462<br>(4.3%)    | 2062<br>(19.0%) | 10826<br>(100%) |

Table 3.4 Leading MVTI Categories By Policing Jurisdiction, Hospitalization Data, 1995-1998, BC

Table 3.4 shows the leading MVTI categories by policing jurisdiction. All the jurisdictions have a high number of injuries due to MV-Occupant. Northern, Southeast, Southwest and Greater Vancouver and Victoria Regions respectively have 82.5, 80.0, 79.0, and 67.4 percent of all injuries in the MV-Occupant. Greater Vancouver and Victoria Region has a greater percentage of injuries involving MV-Pedestrian (19.0%) than the rest of the regions ( $p < 0.05$ ).

#### 4 NON-FATAL MVTI'S –CHIRPP DATA

There were 1180 injury visits to the BCCH's emergency department during the period from 1995 to 1998. **The number of MVTI by age and gender are shown in Figure 4.1** with the highest number of injuries occurring among children 10 to 14 years of age. Please note that these results reflect the age categories of the children that are seen in BCCH.

Figure 4.1: Motor Vehicle Traffic Injuries, BC's Children's Hospital, CHIRPP, 1995-1998, by Age and Gender.

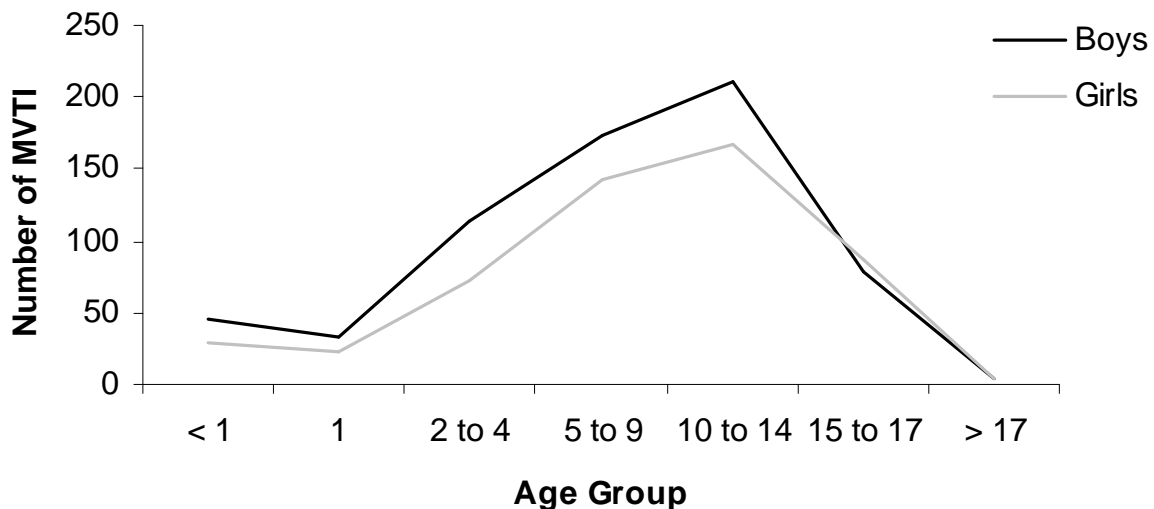


Figure 4.2, 4.3 and 4.4 show that for both genders MVTI occurred more frequently during the summer (June, July, August), on the weekends, afternoons and early evening hours.

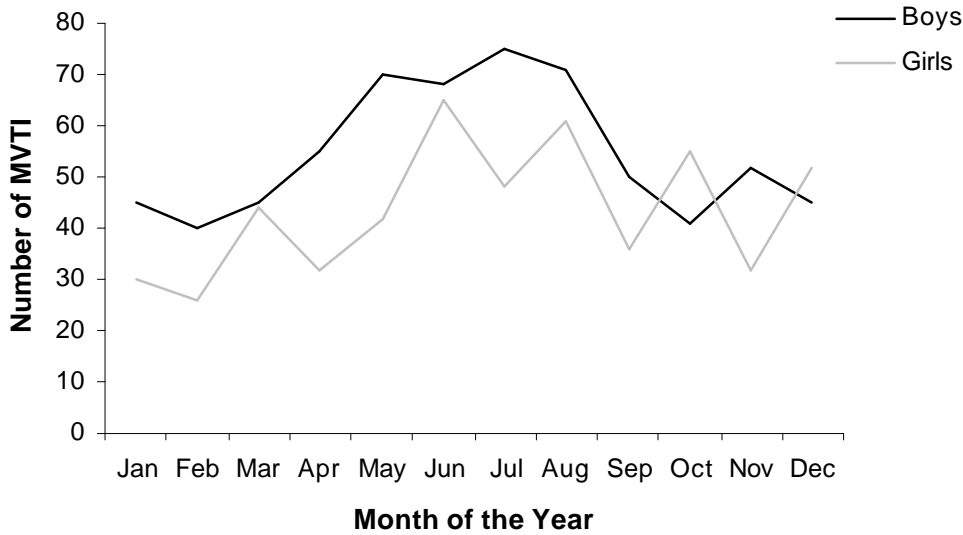


Figure 4.2: Monthly Occurrence of MVTI, BC's Children's Hospital, CHIRPP, 1995-1998, by Gender.

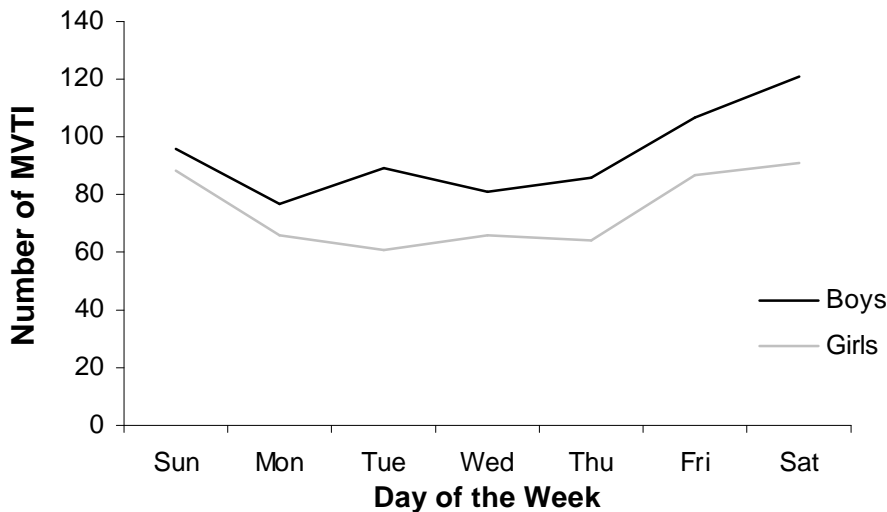


Figure 4.3: Day of MVTI Occurrence, BC's Children's Hospital, CHIRPP, 1995-1998, by Gender.

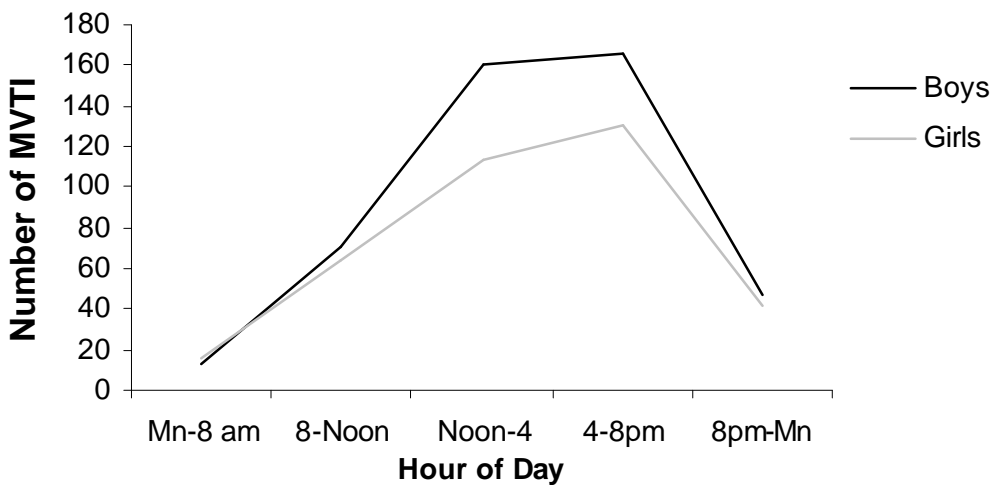
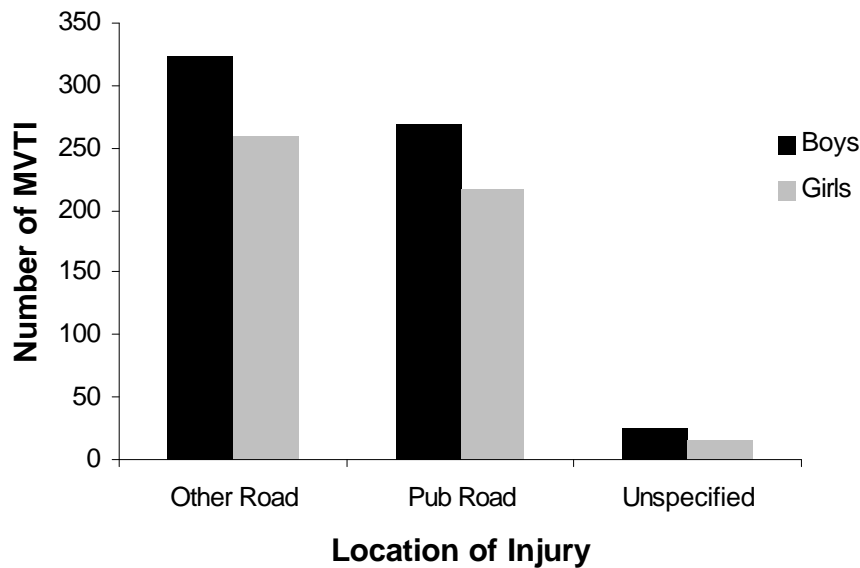


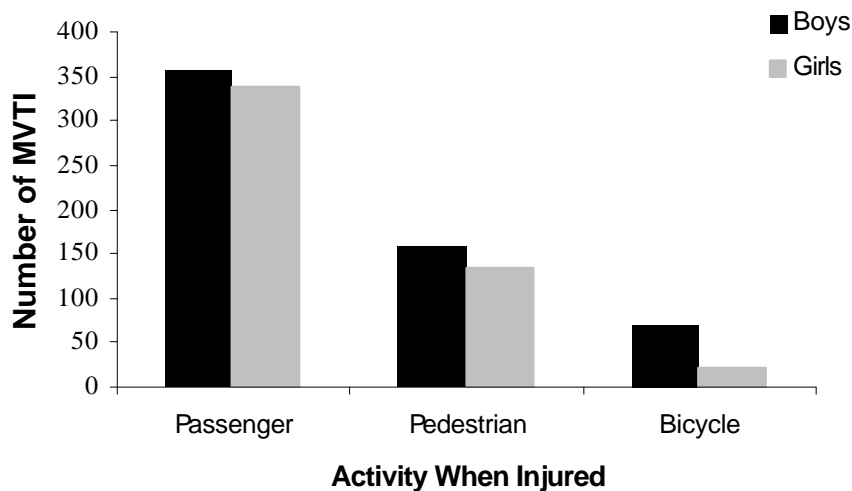
Figure 4.4: Hour of MVTI Occurrence, BC's Children's Hospital, CHIRPP, 1995-1998, by Gender.

**Figure 4.5 shows the location of the injury event.** The most frequently reported locations for both males and females were other road (51%) and public road (43%). The injury event location was not specified in about 4 percent of the cases.

**Figure 4.6 shows the activity by gender when injured.** For both males and females, about 59 percent of MVTI injury victims were passengers and 25 percent were pedestrians. Among males, about 55 percent of the victims were passengers and approximately 24 percent were pedestrians. Among females, 65 percent of victims of MVTI injuries were passengers and 25 percent were pedestrians.



*Figure 4.5: Location where MVTI Occurred, BC's Children's Hospital, CHIRPP, 1995-1998, by Gender.*



*Figure 4.6: Activity Leading to MVTI, BC's Children's Hospital, CHIRPP, 1995-1998, by Gender.*

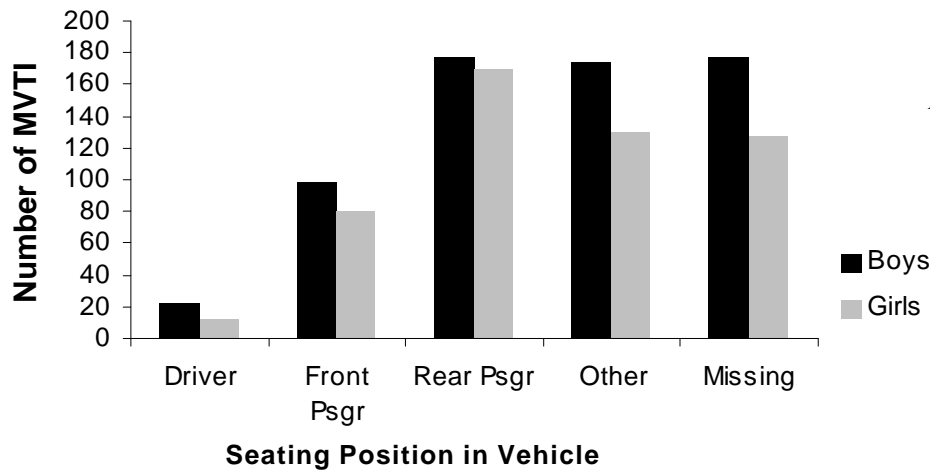
**Figure 4.7** shows the seating position at the time of the MVTI. About 26 percent of the cases had missing data for seating position in vehicle for both males and females. For both males and females, about 30 percent of MVTI victims were rear seat passengers and 15 percent were front seat passengers.

Among males, about 27 percent of the victims were rear seat passengers and approximately 15 percent were front seat passengers.

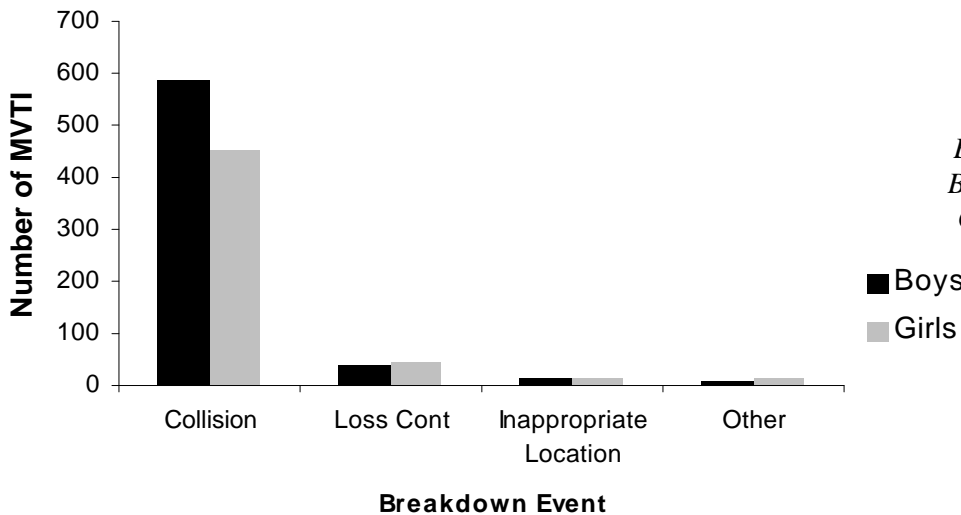
Among females, 33 percent of victims of MVT injuries were rear seat passengers and 15 percent were front seat passengers.

The breakdown events for MVTI are illustrated in **Figure 4.8** for males and females. These are the events that led to the occurrence of the injury, or more specifically, “*how things went wrong*”. Being in collision was responsible for 88 percent of all MVTI while Loss of Control of the motor vehicle was responsible for 7 percent.

The proportions were similar for males and females. Among males, being in a collision was reported for 89 percent of all MVTI. Loss of Control events were responsible for 6 percent of injuries. Among females, being in a collision was reported for 87 percent of all MVTI while Loss of Control events were responsible for 7 percent of all injuries.



*Figure 4.7: Seating Position in Vehicle, BC's Children's Hospital, CHIRPP, 1995-1998, by Gender.*

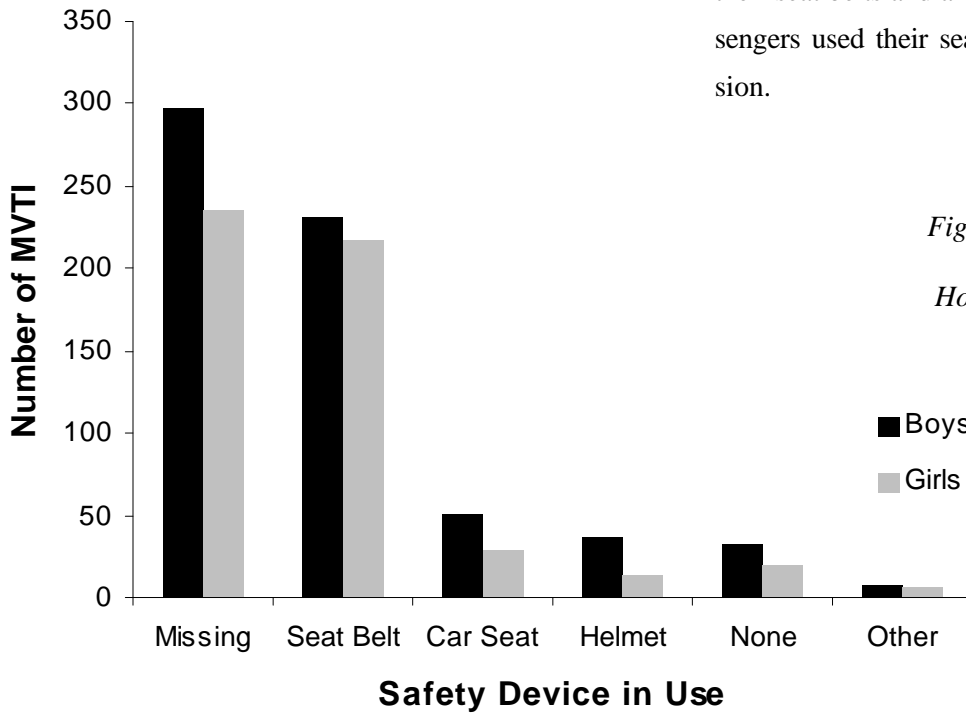


*Figure 4.8: Breakdown Events Leading to MVTI, BC's Children's Hospital, CHIRPP, 1995-1998, by Gender.*

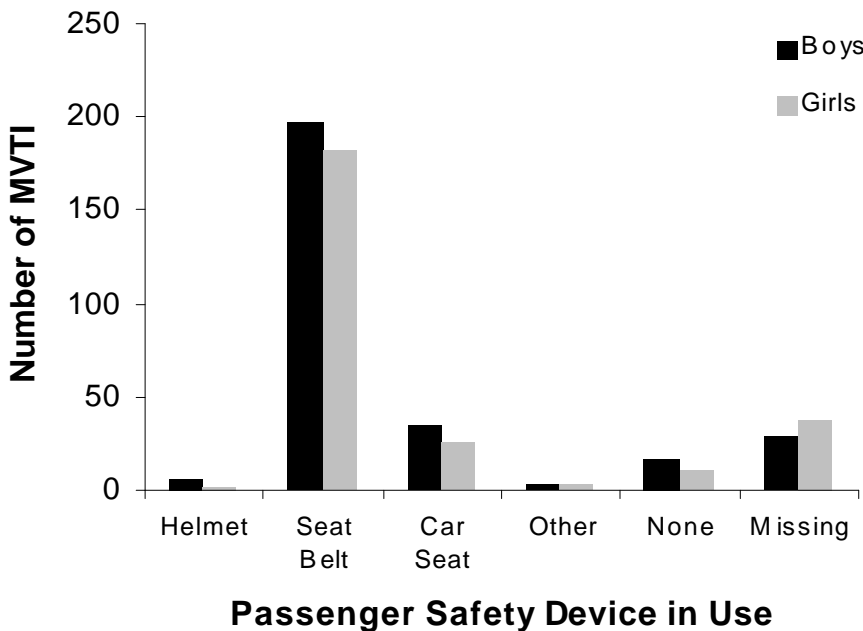
The safety device in use is illustrated in *Figure 4.9*. The majority (45%) of the cases are reported to have missing data for safety device. Seat belt was involved as a safety device in 38 percent of MVTI.

The safety device in use by passengers is illustrated in *Figures 4.10*. Missing data on passenger safety device utilization was found in approximately 12 percent of MVTI for both males and females.

For passengers, for both males and females, about 69 percent of injured passengers were wearing seat belts. Among males, about 69 percent of the passengers used their seat belts and among females, 70 percent of passengers used their seat belts at the time of the collision.



*Figure 4.9: Safety Device in Use in MVTI, BC's Children's Hospital, CHIRPP, 1995-1998, by Gender.*



*Figure 4.10: Passenger Safety Device Use in MVTI, BC's Children's Hospital, CHIRPP, 1995-1998, by Gender.*

The location of the injury event describes where the individual was when the injury-producing event took place. As shown in Figure 4.11 the most frequently reported location for males and females was the paved road (39%). Injury event location was not specified for about 55 percent of the cases.

The mechanism of injury describes the way in which the injury was inflicted. Contact with a moving object accounted for 50 percent of all injuries for both genders and contact with a still object accounted for 42 percent of all injuries for both genders. (Figure 4.12) Similar proportions were observed for males and females. Among males, contact with a moving object accounted for 53 percent of all injuries and contact with a still object accounted for 40 percent of all injuries. Among females, contact with a moving object accounted for 47 percent of all injuries and contact with a still object accounted for 43 percent of all injuries.

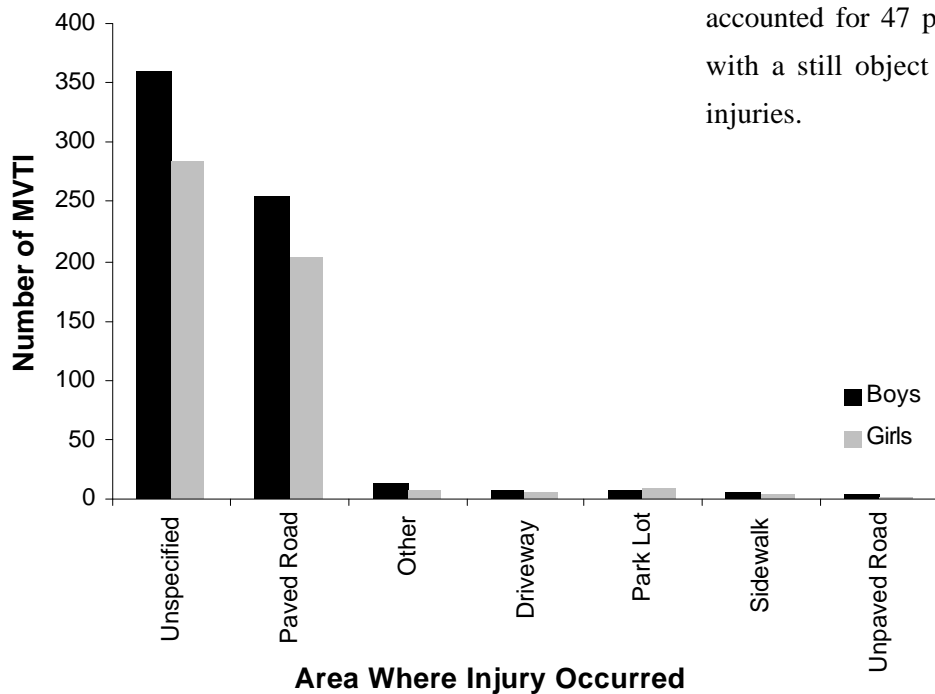


Figure 4.11: Area where MVTI Occurred, BC's Children's Hospital, CHIRPP, 1995-1998, by Gender.

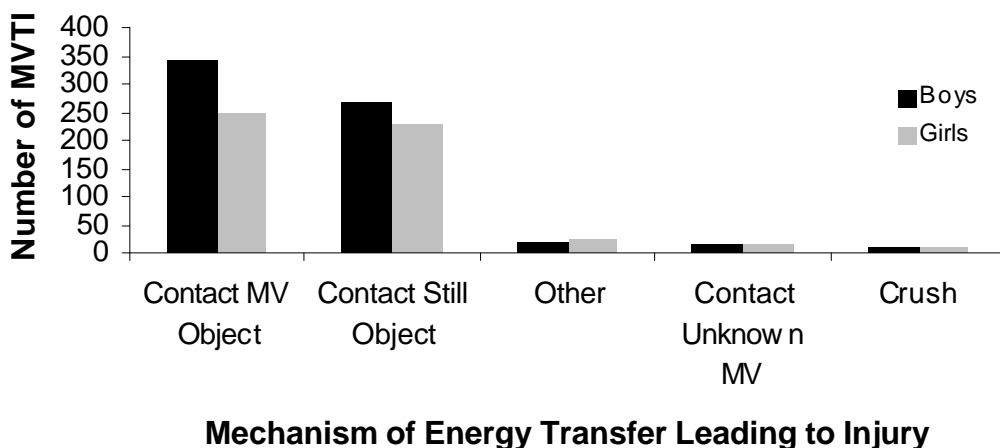


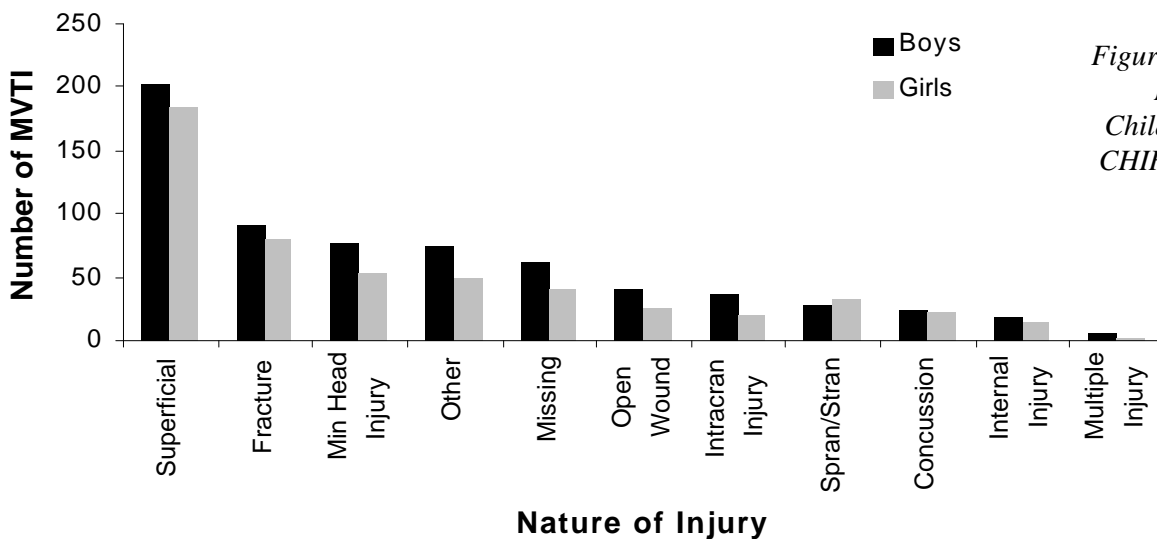
Figure 4.12: Mechanism Leading to MVTI, BC's Children's Hospital, CHIRPP, 1995-1998, by Gender.

The types of MVTI most frequently reported are highlighted in *Figure 4.13*. Superficial wounds such as minor bruises and abrasions represented 33 percent of all types of injuries followed by fractures (14%). Head injuries were the third most common type of injury accounting for 11 percent of all injuries. For 9 percent of the cases, the nature of injury was not reported.

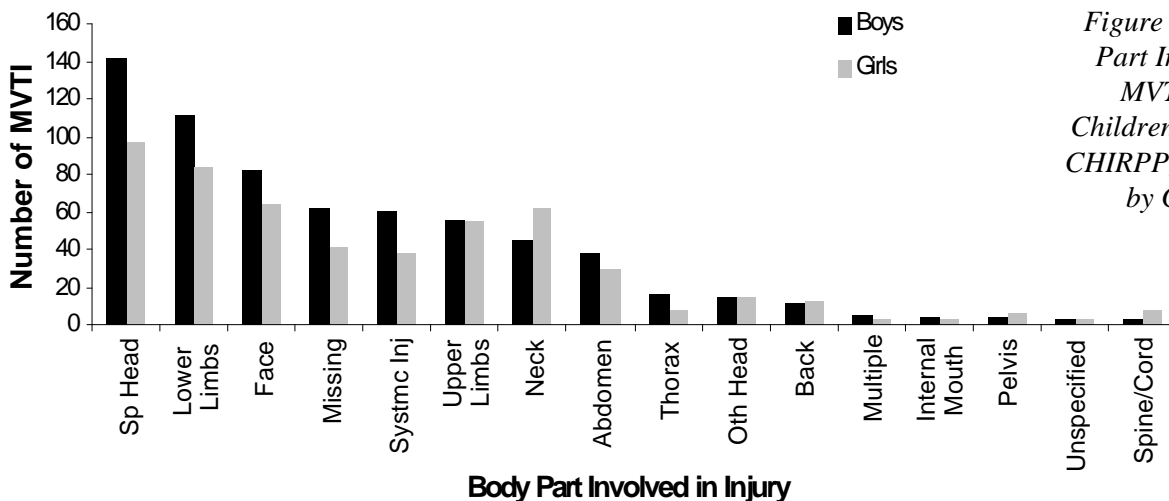
Among males, superficial wounds accounted for 31 percent of all injuries, followed by fractures (14%) and head injuries (12%). Among females, superficial wounds accounted for 35 percent of all injuries, followed by fractures (15%) and head injuries (10%).

The most frequently injured body parts by gender are summarized in *Figure 4.14*. Head injuries were the most frequently injured body part for all MVTI injuries (20%), followed by injuries to the lower limbs (17%). Nine percent of cases had missing data on injured body parts. The face was the third most frequently injured area of the body (12%).

Among males, head injuries were observed in 22 percent of all injuries, followed by injuries to the lower limbs (17%) and face (13%). Among females, head injuries were observed in 19 percent of all injuries, followed by injuries to the lower limbs (16%) and face (12%).



*Figure 4.13: Nature of MVTI, BC's Children's Hospital, CHIRPP, 1995-1998, by Gender.*



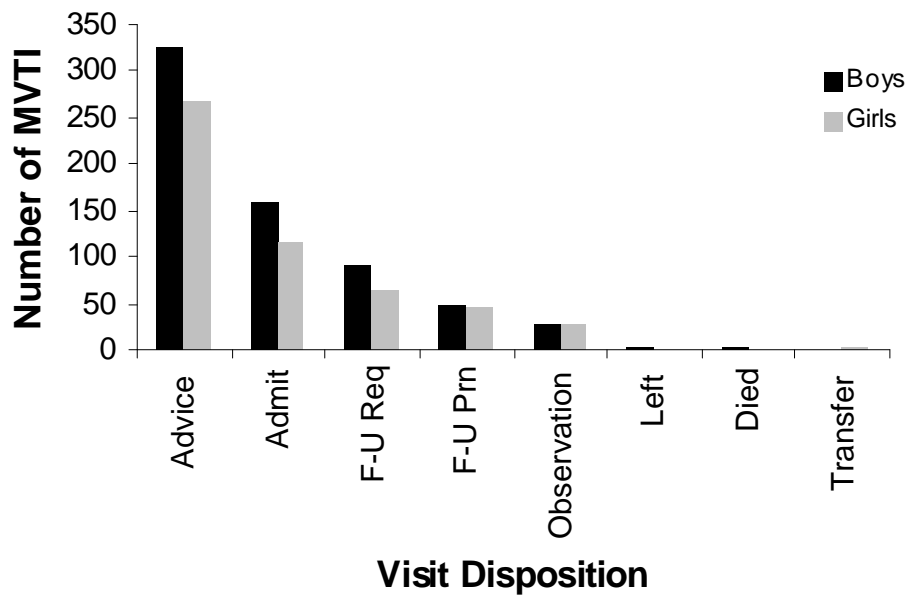
*Figure 4.14: Body Part Involved in MVTI, BC's Children's Hospital, CHIRPP, 1995-1998, by Gender.*

**Fifty percent of all MVTI victims obtained advice in the emergency department** (Figure 4.15). Approximately 23 percent of injured victims were admitted. About 13 percent of injured victims required follow-up treatment.

Among males, 50 percent obtained advice, 24 percent were admitted and 14 percent required follow-up treatment.

Among females, 51 percent obtained advice, 22 percent were admitted and 12 percent required follow-up treatment.

*Figure 4.15: Visit Disposition for MVTI, BC's Children's Hospital, CHIRPP, 1995-1998, by Gender.*



## C. IMPLICATIONS FOR PREVENTION AND RECOMMENDATIONS

The provincial and regional profile of MVTI developed in this study clearly supports the need for continued efforts in the area of traffic safety. In this section of the report, we will provide a review of the main results from this study, discuss some principles of injury prevention and suggest general recommendations to address the problem of MVTI globally. These recommendations have a potential to target a broad array of MVTI outcomes. Finally, based on each of the main results of this study we will present more specific recommendations.

### 1. REVIEW OF MAIN RESULTS

Results of this study can be grouped into four main categories: age and gender differences, regional variations, alcohol involvement in MVTI deaths and specific patterns of MVTI seen in the BCCH Emergency Department.

**a. Age and gender differences:** Age-specific rates of death and hospitalization due to MVTI showed higher rates among youth (15-24) and among seniors (particularly males) aged 80 years and over. This pattern was consistent for both genders. Injuries also tend to be more severe among males than among females. This pattern was in turn consistent across the data sets used in this study.

**b. Regional variations:** Northern and rural regions of BC showed higher rates of severe MVTI than southern and urban areas. This pattern was consistent across mortality and hospitalization data. There were similar proportions of driver and passenger deaths across the northern, southeast and southwest policing jurisdictions. The lowest proportions of driver and passenger deaths were found in Greater Vancouver/Greater Vic-

toria. Conversely, there were higher proportions of pedal cyclist and pedestrian deaths in Greater Vancouver/Greater Victoria.

**c. Alcohol Involvement:** Alcohol was present in a high percentage of MVTI deaths. This was consistent across male and female drivers, passengers and pedestrians. Almost three-quarters of all drivers involved in alcohol related MVTI deaths were legally impaired. It is also notable 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 MVTI deaths in about 92 percent, 91 percent, 87 percent and 88 percent of the cases respectively in the Northern, Southeast, Southwest and Greater Vancouver/Greater Victoria. Finally, it is notable that about half of these alcohol related deaths were evenly distributed across the Northern jurisdiction and the Greater Vancouver/Greater Victoria (about 25 percent in each jurisdiction).

**d. Patterns of MVTI identified in the BCCH emergency department:** Data from the BCCH emergency department showed a higher frequency of MVTI in the summer period, on the weekends, afternoons, early evening hours. A high occurrence of injuries was observed among passengers and pedestrians. The head was the most frequently injured body part and the two most frequent breakdown events were collisions followed by loss of control of the vehicle. Finally, a high number of children (especially boys) were not wearing seat belts when the collision occurred.

## 2. GENERAL PRINCIPLES AND RECOMMENDATIONS

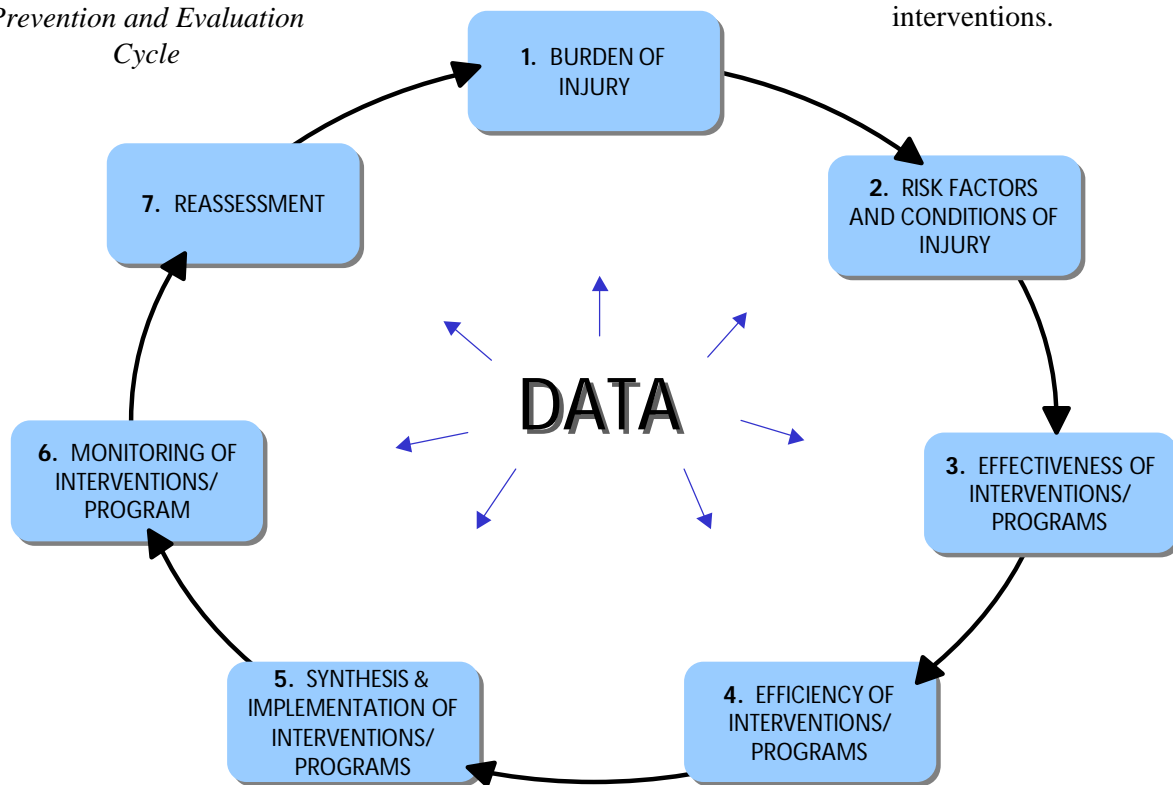
Successful prevention programs are multifaceted and use a combination of approaches. The problem of MVTI is too large and too diverse for any one group to address alone. There is a need for collaborative efforts among a broad range of disciplines, agencies and organizations to contribute to injury prevention,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

The steps to injury prevention and evaluation can be viewed through the Injury Prevention and Evaluation Cycle (IPEC) (Raina, Turcotte, & Soubhi, 2000). IPEC provides a framework for a surveillance system, to collect the information needed to understand and reduce the burden of morbidity and mortality by injury. The cycle is composed of seven steps [Figure C2.1]:

- 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 can be reduced in small increments and data monitoring must be maintained to sustain injury reduction. The cycle is also comprehensive and includes issues related to the development and implementation of injury prevention initiatives that are addressed in steps 2, 3, 4 and 5. These steps identify target risk factors, address implementation issues, as well as the effectiveness and efficiency of preventive interventions.

Figure C2.1: The Injury Prevention and Evaluation Cycle



adapted from Tugwell, Bennett, Sackett, Haynes, 1985

*Table C2.1: Three Phases of Injury Event with Characteristics of the host, the agent and the environment*

|               | 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                           |

Various theoretical models can guide the development of these steps. Haddon’s injury matrix is one of these models. It is widely used for the development of a comprehensive array of interventions (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 (*See Table C2.1*). 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 look like *Table C2.1*.

Control strategies help prevent circumstances which might lead to injury (pre-event phase). They can 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 traveling, and the conditions of the brakes. Looking at the host, one should ask questions such as what was the driver’s physical condition, what safety precautions were taken, and what was the driver’s skill level and experience?

As indicated by this example, the application of Haddon’s matrix requires ongoing documentation of the characteristics of the environment where MVTI occur, the host and the vehicles involved. Hence the need for a comprehensive and systematic injury data collection system.

**Recommendation 1: Develop, implement and evaluate a comprehensive MVTI data collection system including Emergency Departments in BC**

Indeed, appropriate data (either preexisting or new) is 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 this data is easily obtainable and routinely

collected. However, mortality data represents 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 C2.2 of the injury pyramid, mortality-based data does not reflect the extent of an injury problem because most people who are injured do not die from their injuries (Hader & Seliske, 1993).

In order to develop a provincial and regional profile of MVTI in this study, a combination of data sets were used. The data contained regional information covering a wide range of injury severity, hence the inclusion of mortality, hospital and emergency department data. The resulting profile provides a perspective on the problem of MVTI from three levels of the injury pyramid.

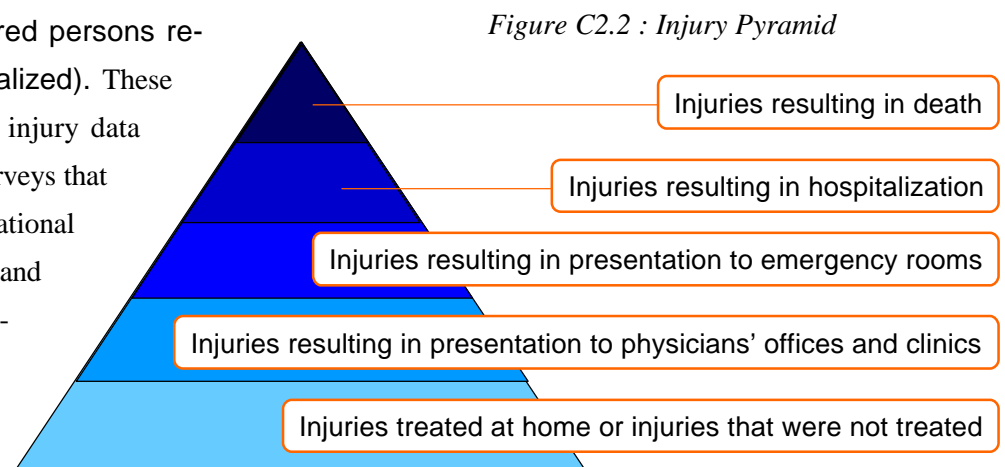
Thus, similar to the approach adopted in this study, there is a need for ongoing documentation of MVTI using a combination of data sources. These data sources would include but not be limited to ICBC, BC Vital Statistics Agency, BC Office of the Coroner, Hospital Separation data, and emergency department data. Indeed, such an approach should involve in the short term all emergency departments in BC as much clinical and circumstantial information on injuries is missed by injury surveillance systems using only fatality or hospital data (it is estimated that only between 5% to 13% of injured persons reporting to the ED are hospitalized). These data can be complemented by injury data provided by various national surveys that address injuries such as the National Longitudinal Survey of Children and Youth and the National Popula-

tion Health Survey. In addition, more targeted studies would address specific traffic safety issues (e.g., public perception regarding safety devices) as well as program implementation issues. Such an approach would help broaden the scope of injury data collection and analysis to assist in designing better preventive measures to reduce MVTI. It would also provide relevant information geared toward specific performance measures.

### **Recommendation 2: Develop, implement and evaluate a set of performance measures for traffic safety interventions**

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

The analysis (burden of injury assessment) phase includes data collection and analysis as well as internal and external environmental analyses. Key indicators would include population demographics, ethnic composition, occupations and economic level of communities; the identification of 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.



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Measurements related to key design development activities include monitoring the development of a comprehensive plan, targeting of high-risk groups and injuries, proposed interventions based on mortality and morbidity behavioural risk factors, data for the defined geographic area/target group, identification and involvement of important individuals (experts, community leaders), and selection of 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, selection and definition of relevant outcomes (e.g., incidence and severity of MVTI).

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 public health, medical, law enforcement, political, community, and other players organized and united into a planned health promotion approach. Hence the need for a reinforced political commitment to traffic safety.

**Recommendation 3: Reinforce the political commitment to traffic safety within integrated strategies that address both environmental (physical and social) and health impacts of transport.**

Experiences from various countries in the European Union, highlight the need to broaden traffic safety interventions to strategies that combine both environ-

mental and health gains (Dora & Racioppi, 2000). This approach calls for a complete rethinking of the nature of and need for mobility, an improved knowledge of the pattern of road and land use (especially in the northern regions) and of the transport consumption patterns. For example, 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) would combine health gains with environmental gains.

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-sectoral collaboration to prevent and control injuries (e.g., stakeholders in the areas of health, transport, education, rehabilitation, substance abuse and public safety)
- Monitor the transport environment and transport strategies and their impact on health
- Review policies for greater integration of health concerns into transport strategies
- Secure funding for pilot projects and research.

### 3. SPECIFIC RECOMMENDATIONS

**a. Age and gender differences:** The high number of MVTI occurring among the youth and elderly suggest the need for an improved focus on driver licensing and education for these groups.

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**Recommendation 4: Ensure that driver license renewal and acquisition is comprehensive for both young and older drivers.**

New driver programs 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, & 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 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 very limited.

Concerning gender differences, the literature suggests that young males tend to take more risk than females. 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). This may suggest the need to increase

the focus of behavioural education towards males more than females. However, more research is needed to understand the behavioral and psychological factors that contribute to gender differences in mortality.

**b. 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). Crash rates as well as the proportion of different road user types often differs between rural and urban areas (Baker, Whitfield, & O'Neill, 1987). In northern, remote and rural areas of British Columbia, adverse environmental conditions may promote increased rates of motor vehicle crashes. High speeds on open roads are common, roads may be less safe, and medical care is generally less accessible than in urban areas, which may result in treatment delays and more severe injury outcomes.

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-absorbing capability of vehicle components. Environmental factors address the quality of road design, the identification of high-risk locations or blackspots in highways, and the installation of protective barriers and breakaway features for fixed roadside obstacles.

In general, there is a need for an energetic, well-organized and sustained public lobbying of governments to encourage legislation 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 reinforce low speeds have shown reduced injuries to

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all vulnerable road users including cyclists (Barss, Smith, Baker, & Mohan et al., 1998).

Regional variations in injury deaths may also be indicative of socioeconomic variations across the province. Numerous studies have shown that among children and teenagers, the socioeconomic differentials in mortality rates are large and the major source of this differential risk is traumatic deaths (Mare, 1982). Children in low socioeconomic areas tend to live in environments that are more hazardous with higher traffic density, fewer satisfactory play areas, and lower use of injury prevention devices such as infant seat restraints. Specific countermeasures should therefore move beyond the action on behavioral determinants of injury (e.g., law enforcement). They should include the influence of broader determinants, such as social and economic conditions, the physical environment, health care capacity, legislation and public health policies, in order to make a substantial and long lasting impact on the burden of MVTI. A regional, community-based approach that builds on identified local needs and resources would be the most efficient in this regard.

### **Recommendation 5: Create and promote coordinated regional policies in the area of motor vehicle traffic safety.**

It is at the local level that needs and resources should be identified, data collected, community support garnered and interventions implemented. 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 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 MVTI 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 at the level of health regions of MVTI 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 at the Ministry of the Attorney General or the Ministry of Health.

**d. Alcohol Involvement:** While a lot has been done through education and enforcement to discourage drinking and driving, it remains a serious concern as indicated by the results of this study.

### **Recommendation 6: Ensure that efforts directed against drinking and driving are**

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**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 the 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 percent (Hingson, Heeren, & Winter, 1994). However, this type of measure would require a tough and consistent judicial system. As indicated in the Traffic Services Study Discussion Paper, in the last 10 years, the number of 24-hour prohibitions has been steadily increasing. Furthermore, 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. Enhanced CounterAttack implemented in BC since 1995 is an excellent initiative that should be encouraged and its public visibility increased through periodic reminders using a variety of media. Moreover, activities of the police forces should move beyond law enforcement to include the creation and promotion of traffic safety messages.

**Recommendation 7: Expand the focus of MVTI control to include the combination of alcohol and drugs.**

As indicated in this study, a combination of alcohol and drugs is often found in similar proportions among males and females as a contributing factor to MVTI deaths, especially in the Greater Vancouver/Greater Victoria policing jurisdiction. Other research has

shown that drugs other than alcohol contribute to a significant number of traffic fatalities in BC (Mercer and 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 and 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.

**e. Patterns of MVTI identified in the BCCH emergency department:** As indicated by the BCCH emergency department data used in this study, child restraint is not systematically used. While enforcement is an effective way to increase the use of occupant restraints, studies show that the most effective way to increase compliance is through a combination of education and enforcement.

**Recommendation 8: 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 children 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 child restraint and seat belts (O'Donnell & Mickalide, 1998).

Educational programs involving classroom education, social learning techniques and pediatric counseling have led to increased restraint use (Stulginskas and

Pless, 1983; Decina, Temple, and Dorer, 1994; and 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 and MacKinnon, 1985; and Stuy and 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 and Ciccone, 1993).

#### 4. CONCLUSION

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 the 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. Ultimately, the critical indicators of successful implementation of a MVTI prevention program include legislative activities, surveillance, monitoring and evaluation, community involvement with the injury program, and the ability to institutionalize the program.

Based on four data sets that cover a wide spectrum of injury severity, the results presented in this report provide a provincial and regional profile of MVTI. This study identifies a number of high-risk traffic issues, especially in the areas of regional variations, impaired driving and driver education and safety. We expect these results to serve as baseline data for assessing impact of future changes in Traffic Service Safety. It is also anticipated that these results will be combined with other components of the Traffic Services Study conducted by the Police Services Division to provide a comprehensive Traffic Safety program.

#### *Exhibit C-1: List of Recommendations*

**Recommendation 1:** Develop, implement and evaluate a comprehensive MVTI data collection system. In the short term, such a system should promote the development and implementation of an emergency department based surveillance system.

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

**Recommendation 3:** Reinforce the political commitment to traffic safety within integrated strategies that address both environmental (physical and social) and health impacts of transport.

**Recommendation 4:** Ensure that driver license renewal and acquisition is comprehensive for both young and older drivers.

**Recommendation 5:** Create and promote coordinated regional policies in the area of motor vehicle traffic safety.

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

**Recommendation 7:** Expand the focus of MVTI control to include the combination of alcohol and drugs.

**Recommendation 8:** Continue to encourage the use of occupant restraints through legislation and education.

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# APPENDICES

# APPENDIX 1

## Health Regions Conversion Tables

| New Local Health Area Name    | New Health Region Name     |
|-------------------------------|----------------------------|
| Fernie                        | East Kootenay              |
| Cranbrook                     | East Kootenay              |
| Kimberley                     | East Kootenay              |
| Windermere                    | East Kootenay              |
| Creston                       | East Kootenay              |
| Kootenay Lake                 | West Kootenay - Boundary   |
| Nelson                        | West Kootenay - Boundary   |
| Castlegar                     | West Kootenay - Boundary   |
| Arrow Lakes                   | West Kootenay - Boundary   |
| Trail                         | West Kootenay - Boundary   |
| Grand Forks                   | West Kootenay - Boundary   |
| Kettle Valley                 | West Kootenay - Boundary   |
| Southern Okanagan             | South Okanagan Similkameen |
| Penticton                     | South Okanagan Similkameen |
| Keremeos                      | South Okanagan Similkameen |
| Princeton                     | South Okanagan Similkameen |
| Golden                        | East Kootenay              |
| Revelstoke                    | North Okanagan             |
| Salmon Arm                    | North Okanagan             |
| Armstrong - Spallumcheen      | North Okanagan             |
| Vernon                        | North Okanagan             |
| Central Okanagan              | South Okanagan Similkameen |
| Kamloops                      | Thompson                   |
| 100 Mile House                | Cariboo                    |
| North Thompson                | Thompson                   |
| Cariboo - Chilcotin           | Cariboo                    |
| Quesnel                       | Cariboo                    |
| Lillooet                      | Thompson                   |
| South Cariboo                 | Thompson                   |
| Merritt                       | Thompson                   |
| Hope                          | Fraser Valley              |
| Chilliwack                    | Fraser Valley              |
| Abbotsford                    | Fraser Valley              |
| Langley                       | South Fraser Valley        |
| Surrey                        | South Fraser Valley        |
| Delta                         | South Fraser Valley        |
| Richmond                      | Richmond                   |
| New Westminster               | Simon Fraser               |
| Burnaby                       | Burnaby                    |
| Maple Ridge                   | Simon Fraser               |
| Coquitlam                     | Simon Fraser               |
| North Vancouver               | North Shore                |
| West Vancouver - Bowen Island | North Shore                |
| Sunshine Coast                | Coast Garibaldi            |
| Powell River                  | Coast Garibaldi            |
| Howe Sound                    | Coast Garibaldi            |

|                               |                            |
|-------------------------------|----------------------------|
| Bella Coola Valley            | Cariboo                    |
| Queen Charlotte               | North West                 |
| Snow Country                  | North West                 |
| Prince Rupert                 | North West                 |
| Upper Skeena                  | North West                 |
| Smithers                      | North West                 |
| Burns Lake                    | Northern Interior          |
| Nechako                       | Northern Interior          |
| Prince George                 | Northern Interior          |
| Peace River South             | Peace Liard                |
| Peace River North             | Peace Liard                |
| Greater Victoria              | Capital                    |
| Sooke                         | Capital                    |
| Saanich                       | Capital                    |
| Gulf Islands                  | Capital                    |
| Cowichan                      | Central Vancouver Island   |
| Lake Cowichan                 | Central Vancouver Island   |
| Ladysmith                     | Central Vancouver Island   |
| Nanaimo                       | Central Vancouver Island   |
| Qualicum                      | Central Vancouver Island   |
| Alberni                       | Central Vancouver Island   |
| Courtenay                     | Upper Island/Central Coast |
| Campbell River                | Upper Island/Central Coast |
| Mission                       | Fraser Valley              |
| Agassiz - Harrison            | Fraser Valley              |
| Summerland                    | South Okanagan Similkameen |
| Enderby                       | North Okanagan             |
| Kitimat                       | North West                 |
| Fort Nelson                   | Peace Liard                |
| Central Coast                 | Upper Island/Central Coast |
| Vancouver Island West         | Upper Island/Central Coast |
| Vancouver Island North        | Upper Island/Central Coast |
| Stikine                       | North West                 |
| Terrace                       | North West                 |
| Nisga'a                       | North West                 |
| Telegraph Creek               | North West                 |
| Vancouver - City Centre       | Vancouver                  |
| Vancouver - Downtown Eastside | Vancouver                  |
| Vancouver - North East        | Vancouver                  |
| Vancouver - Westside          | Vancouver                  |
| Vancouver - Midtown           | Vancouver                  |
| Vancouver - South             | Vancouver                  |
| British Columbia              | British Columbia           |

| Police Detachment   | Health Region |                               |
|---------------------|---------------|-------------------------------|
| 100 Mile Det.       | 12            |                               |
| Abbotsford Mun      | 6             |                               |
| Agassiz Det.        | 6             |                               |
| Alert Bay Det.      | 11            |                               |
| Alexis Creek Det.   | 12            |                               |
| Anahim Lake Det.    | 12            |                               |
| Armstrong Det.      | 3             |                               |
| Ashcroft Det.       | 5             |                               |
| Atlin Det.          | 13            | 1 East Kootenay               |
| Barriere Det.       | 5             | 2 West Kootenay - Boundary    |
| Bella Bella Det.    | 12            | 3 North Okanagan              |
| Bella Coola Det.    | 12            | 4 South Okanagan Similkameen  |
| Boston Bar Det.     | 6             | 5 Thompson                    |
| Bowen Island Det.   | 18            | 6 Fraser Valley               |
| Burnaby Det.        | 17            | 7 South Fraser Valley         |
| Burns Lake Det.     | 15            | 8 Simon Fraser                |
| Campbell River Det. | 11            | 9 Coast Garibaldi             |
| Castelgar Det.      | 2             | 10 Central Vancouver Island   |
| Central Saanich Mun | 20            | 11 Upper Island/Central Coast |
| Chase Det.          | 5             | 12 Cariboo                    |
| Chetwynd Det.       | 14            | 13 North West                 |
| Chilliwack Det.     | 6             | 14 Peace Liard                |
| Clearwater Det.     | 5             | 15 Northern Interior          |
| Clinton Det.        | 5             | 16 Vancouver                  |
| Coquitlam Det.      | 8             | 17 Burnaby                    |
| Courtenay Det.      | 11            | 18 North Shore                |
| Cranbrook Det.      | 1             | 19 Richmond                   |
| Creston Det.        | 1             | 20 Capital                    |
| Dawson Creek Det.   | 14            |                               |
| Dease Lake Det.     | 13            |                               |
| Delta Mun           | 7             |                               |
| Elkford Det.        | 1             |                               |
| Enderby Det.        | 3             |                               |
| Esquimalt Mun       | 20            |                               |
| Falkland Det.       | 3             |                               |
| Fernie Det.         | 1             |                               |
| Fort Nelson Det.    | 14            |                               |
| Fort St. James Det. | 15            |                               |
| Fort St. John Det.  | 14            |                               |
| Fraser Lake Det.    | 15            |                               |
| Fruitvale Det.      | 2             |                               |
| Galiano Island Det. | 10            |                               |
| Gibsons Det.        | 9             |                               |
| Gold River Det.     | 11            |                               |
| Golden Det.         | 1             |                               |
| Grand Forks Det.    | 2             |                               |
| Granisle Det.       | 15            |                               |

|                      |    |
|----------------------|----|
| Hope Det.            | 6  |
| Houston Det.         | 13 |
| Hudson Hope Det.     | 14 |
| Kamloops Det.        | 5  |
| Kaslo Det.           | 2  |
| Kelowna Det.         | 4  |
| Keremeos Det.        | 4  |
| Kimberley Det.       | 1  |
| Kitimat Det.         | 13 |
| Ladysmith Det.       | 10 |
| Lake Cowichan Det.   | 10 |
| Langley Det.         | 7  |
| Lillooet Det.        | 5  |
| Lisims/Nass Valley   | 13 |
| Logan Lake Det.      | 5  |
| Lumby Det.           | 3  |
| Lytton Det.          | 5  |
| Mackenzie Det.       | 14 |
| Masset Det.          | 13 |
| McBride Det.         | 15 |
| Merritt Det.         | 5  |
| Midway Det.          | 2  |
| Nakusp Det.          | 2  |
| Nanaimo Det.         | 10 |
| Nelson Det.          | 2  |
| Nelson Mun           | 2  |
| New Denver Det.      | 2  |
| New Hazelton Det.    | 13 |
| New Westminster Mun  | 8  |
| North Cowichan Det.  | 10 |
| North Vancouver Det. | 18 |
| Oak Bay Mun          | 20 |
| Oliver Det.          | 4  |
| Osoyoos Det.         | 4  |
| Outer Gulf Islands   | 20 |
| Parksville Det.      | 10 |
| Pemberton Det.       | 9  |
| Penticton Det.       | 4  |
| Port Alberni Det.    | 10 |
| Port Alice Det.      | 11 |
| Port Hardy Det.      | 11 |
| Port McNeill Det.    | 11 |
| Port Moody Mun       | 8  |
| Powell River Det.    | 9  |
| Prince George Det.   | 15 |
| Prince Rupert Det.   | 13 |
| Princeton Det.       | 4  |
| Quadra Island Det.   | 11 |
| Queen Charlotte Det. | 13 |
| Quesnel Det.         | 12 |

|                     |    |
|---------------------|----|
| Revelstoke Det.     | 3  |
| Richmond Det.       | 19 |
| Ridge Meadows Det.  | 8  |
| Rossland Det.       | 2  |
| Saanich Mun         | 20 |
| Salmo Det.          | 2  |
| Salmon Arm Det.     | 3  |
| Sayward Det.        | 11 |
| Sechelt Det.        | 9  |
| Shawnigan Lake Det. | 10 |
| Sicamous Det.       | 3  |
| Sidney Det.         | 20 |
| Smithers Det.       | 13 |
| Sooke Det.          | 20 |
| Sparwood Det.       | 1  |
| Squamish Det.       | 9  |
| Squamish HP.        | 9  |
| Stewart Det.        | 13 |
| Summerland Det.     | 4  |
| Surrey Det.         | 7  |
| Tashis Det.         | 11 |
| Terrace Det.        | 13 |
| Texada Island Det.  | 9  |
| Tofino Det.         | 10 |
| Trail Det.          | 2  |
| Tsa Keh Det.        | 14 |
| Tumbler Ridge Det.  | 14 |
| Ucluelet Det.       | 10 |
| University Det.     | 16 |
| Valemount Det.      | 15 |
| Vancouver Mun       | 16 |
| Vanderhoof Det.     | 15 |
| Vernon Det.         | 3  |
| Victoria Mun        | 20 |
| Wells Det.          | 12 |
| West Vancouver Mun  | 18 |
| Western Communities | 20 |
| Whistler Det.       | 9  |
| White Rock Det.     | 7  |
| Williams Lake Det.  | 12 |

## APPENDIX 2

Participating Hospitals in CHIRPP, 1993.

## Participating Hospitals in CHIRPP, 1993.

| PARTICIPATING HOSPITAL  | CITY          | PROVINCE              |
|---|---------------|-----------------------|
| Dr. Charles A. Janeway Child Health Centre  | St. John's    | Newfoundland          |
| Izaak Walton Killam Hospital for Children*  | Halifax       | Nova Scotia           |
| Hopital de l'enfant-Jesus <sup>a</sup>  | Quebec City   | Quebec                |
| Hopital Sainte-Justine*   | Montreal      | Quebec                |
| The Montreal Children's Hospital*   | Montreal      | Quebec                |
| Children's Hospital of Eastern Ontario*   | Ottawa        | Ontario               |
| Hotel Dieu <sup>b</sup>   | Kingston      | Ontario               |
| Kingston General Hospital   | Kingston      | Ontario               |
| The Hospital for Sick Children*   | Toronto       | Ontario               |
| Children's Hospital of Western Ontario*   | London        | Ontario               |
| Sioux Lookout Zone Hospital <sup>c</sup>  | Sioux Lookout | Ontario               |
| Children's Hospital*  | Winnipeg      | Manitoba              |
| Alberta Children's Hospital*  | Calgary       | Alberta               |
| British Columbia's Children's Hospital*   | Vancouver     | British Columbia      |
| Stanton Yellowknife Hospital <sup>d</sup>   | Yellowknife   | Northwest Territories |
| <p>* Pediatric hospital<br/> a. Processing forms from the <i>Centre hospitalier regional de Rimouski</i> since 1995<br/> b. Now Closed<br/> c. Processing forms from nursing stations in <i>Fort Severn</i> and <i>Deer Lake</i> since 1994; <i>Kingfisher Lake</i>, <i>Wapekeka</i> and <i>Wunnumin Lake</i> since 1996<br/> d. Processed forms from <i>Baffin</i> nursing station since 1995.</p> |               |                       |

# APPENDIX 3

## E-CODES

## E-CODES

Motor vehicle traffic accidents: E810-E819. Fourth digits form .0 to .9 help identify the injured person (see attached list).

### Glossary

1. A *motor vehicle accident* is a transport accident involving a motor vehicle. It is defined as a motor vehicle traffic accident or as a motor vehicle non-traffic accident according to whether the accident occurs on a public highway or elsewhere.

Excludes: injury or damage due to cataclysm  
Injury or damage while a motor vehicle, not under its own power, is being loaded on, or unloaded from, another conveyance

2. A *motor vehicle traffic accident* is any motor vehicle accident occurring on a public highway (i.e. originating, terminating or involving vehicle partially on the highway). A motor vehicle accident is assumed to have occurred on the highway unless another place is specified, except in the case of accidents involving only off-road motor vehicles, which are classified as non-traffic accidents unless the contrary is stated.

3. A *motor vehicle non-traffic accident* is any motor vehicle accident, which occurs entirely in any place other than a public highway.

4.. A *public highway (trafficway)* or street is the entire width between property lines (or other boundary lines) of every way or place, of which any part is open to the use of the public for purposes of vehicular traffic as a matter of right or custom. A roadway is that part of the public highway designed, improved and ordinarily used, for vehicle travel.

Includes: approaches to: docks, public building, station

Excludes: driveway (private), parking lot, ramp and  
roads in: airfield, farm, industrial premises, mine, private grounds, quarry

5. A *motor vehicle* is any mechanically or electrically powered device, not operated on rails, upon which any person or property may be transported or drawn upon a highway. Any object such as a trailer, coaster, sled, or wagon being towed by a motor vehicle is considered a part of the motor vehicle.

Includes: automobile (any type), bus, construction machinery, farm and industrial machinery, stem roller, tractor, army tank, highway grader or similar vehicle on wheels or treads, while in transport under own power, fire engine (motorized), motorcycle, motorized bicycle (moped) or scooter, trolley bus not operating on rails, truck, van.

Excludes: devices used solely to move persons or materials within the confines of a building and its premises, such as: building elevator, coal car in mine, electric baggage or mail truck used solely within a railroad station, electric truck used solely within an industrial plant, moving overhead crane.

6. A *motorcycle* is a two-wheeled motor vehicle having one or two riding saddles and sometimes having a third wheel for the support of a sidecar. The sidecar is considered part of the motorcycle.

Includes:        motorized bicycle, scooter, tricycle

7. A *driver of a motor vehicle* is the occupant of the motor vehicle operating it or intending to operate it. A motorcyclist is the driver of a motor cycle. Other authorized occupants of a motor vehicle are passengers.

## E-codes list

|       |  |
|-------|--|
| E810  | motor vehicle traffic accident involving collision with train  |
| E8100 | motor vehicle traffic accident involving collision with train - driver of motor vehicle other than motorcycle                |
| E8101 | motor vehicle traffic accident involving collision with train - passenger in motor vehicle other than motorcycle             |
| E8102 | motor vehicle traffic accident involving collision with train - motorcyclist   |
| E8103 | motor vehicle traffic accident involving collision with train - passenger on motorcycle                                      |
| E8104 | motor vehicle traffic accident involving collision with train - occupant of streetcar  |
| E8105 | motor vehicle traffic accident involving collision with train - rider of animal; occupant of animal-drawn vehicle            |
| E8106 | motor vehicle traffic accident involving collision with train - pedal cyclist  |
| E8107 | motor vehicle traffic accident involving collision with train - pedestrian   |
| E8108 | motor vehicle traffic accident involving collision with train - other specified person                                       |
| E8109 | motor vehicle traffic accident involving collision with train - unspecified person   |
| E811  | motor veh traffic accident involv re-entrant collis with anoth motor veh   |
| E8110 | motor veh traffic accident involv re-entrant collis with anoth motor veh - driver of motor vehicle other than motorcycle     |
| E8111 | motor veh traffic accident involv re-entrant collis with anoth motor veh - passenger in motor vehicle other than motorcycle  |
| E8112 | motor veh traffic accident involv re-entrant collis with anoth motor veh - motorcyclist                                      |
| E8113 | motor veh traffic accident involv re-entrant collis with anoth motor veh - passenger on motorcycle                           |
| E8114 | motor veh traffic accident involv re-entrant collis with anoth motor veh - occupant of streetcar                             |
| E8115 | motor veh traffic accident involv re-entrant collis with anoth motor veh - rider of animal; occupant of animal-drawn vehicle |
| E8116 | motor veh traffic accident involv re-entrant collis with anoth motor veh - pedal cyclist                                     |
| E8117 | motor veh traffic accident involv re-entrant collis with anoth motor veh - pedestrian  |
| E8118 | motor veh traffic accident involv re-entrant collis with anoth motor veh - other specified person                            |
| E8119 | motor veh traffic accident involv re-entrant collis with anoth motor veh - unspecified person                                |
| E812  | oth motor vehicle traffic accident involv collision with anoth motor veh   |
| E8120 | oth motor vehicle traffic accident involv collision with anoth motor veh - driver of motor vehicle other than motorcycle     |
| E8121 | oth motor vehicle traffic accident involv collision with anoth motor veh - passenger in motor vehicle other than motorcycle  |
| E8122 | oth motor vehicle traffic accident involv collision with anoth motor veh - motorcyclist                                      |
| E8123 | oth motor vehicle traffic accident involv collision with anoth motor veh - passenger on motorcycle                           |
| E8124 | oth motor vehicle traffic accident involv collision with anoth motor veh - occupant of streetcar                             |
| E8125 | oth motor vehicle traffic accident involv collision with anoth motor veh - rider of animal; occupant of animal-drawn vehicle |
| E8126 | oth motor vehicle traffic accident involv collision with anoth motor veh - pedal cyclist                                     |
| E8127 | oth motor vehicle traffic accident involv collision with anoth motor veh - pedestrian  |
| E8128 | oth motor vehicle traffic accident involv collision with anoth motor veh - other specified person                            |
| E8129 | oth motor vehicle traffic accident involv collision with anoth motor veh - unspecified person                                |
| E813  | motor vehicle traffic accident involving collision with other vehicle  |
| E8130 | motor vehicle traffic accident involving collision with other vehicle - driver of motor vehicle other than motorcycle        |
| E8131 | motor vehicle traffic accident involving collision with other vehicle - passenger in motor vehicle other than motorcycle     |
| E8132 | motor vehicle traffic accident involving collision with other vehicle - motorcyclist   |
| E8133 | motor vehicle traffic accident involving collision with other vehicle - passenger on motorcycle                              |
| E8134 | motor vehicle traffic accident involving collision with other vehicle - occupant of streetcar                                |
| E8135 | motor vehicle traffic accident involving collision with other vehicle - rider of animal; occupant of animal-drawn vehicle    |
| E8136 | motor vehicle traffic accident involving collision with other vehicle - pedal cyclist  |
| E8137 | motor vehicle traffic accident involving collision with other vehicle - pedestrian   |
| E8138 | motor vehicle traffic accident involving collision with other vehicle - other specified person                               |
| E8139 | motor vehicle traffic accident involving collision with other vehicle - unspecified person                                   |
| E814  | motor vehicle traffic accident involving collision with pedestrian   |

|       |  |
|-------|--|
| E8140 | motor vehicle traffic accident involving collision with pedestrian - driver of motor vehicle other than motorcycle           |
| E8141 | motor vehicle traffic accident involving collision with pedestrian - passenger in motor vehicle other than motorcycle        |
| E8142 | motor vehicle traffic accident involving collision with pedestrian - motorcyclist  |
| E8143 | motor vehicle traffic accident involving collision with pedestrian - passenger on motorcycle                                 |
| E8144 | motor vehicle traffic accident involving collision with pedestrian - occupant of streetcar                                   |
| E8145 | motor vehicle traffic accident involving collision with pedestrian - rider of animal; occupant of animal-drawn vehicle       |
| E8146 | motor vehicle traffic accident involving collision with pedestrian - pedal cyclist   |
| E8147 | motor vehicle traffic accident involving collision with pedestrian - pedestrian  |
| E8148 | motor vehicle traffic accident involving collision with pedestrian - other specified person                                  |
| E8149 | motor vehicle traffic accident involving collision with pedestrian - unspecified person                                      |
| E815  | other motor vehicle traffic accident involving collision on the highway  |
| E8150 | other motor vehicle traffic accident involving collision on the highway - driver of motor vehicle other than motorcycle      |
| E8151 | other motor vehicle traffic accident involving collision on the highway - passenger in motor vehicle other than motorcycle   |
| E8152 | other motor vehicle traffic accident involving collision on the highway - motorcyclist                                       |
| E8153 | other motor vehicle traffic accident involving collision on the highway - passenger on motorcycle                            |
| E8154 | other motor vehicle traffic accident involving collision on the highway - occupant of streetcar                              |
| E8155 | other motor vehicle traffic accident involving collision on the highway - rider of animal; occupant of animal-drawn vehicle  |
| E8156 | other motor vehicle traffic accident involving collision on the highway - pedal cyclist                                      |
| E8157 | other motor vehicle traffic accident involving collision on the highway - pedestrian   |
| E8158 | other motor vehicle traffic accident involving collision on the highway - other specified person                             |
| E8159 | other motor vehicle traffic accident involving collision on the highway - unspecified person                                 |
| E816  | motor veh traffic accident due to loss of control, without collis on hwy   |
| E8160 | motor veh traffic accident due to loss of control, without collis on hwy - driver of motor vehicle other than motorcycle     |
| E8161 | motor veh traffic accident due to loss of control, without collis on hwy - passenger in motor vehicle other than motorcycle  |
| E8162 | motor veh traffic accident due to loss of control, without collis on hwy - motorcyclist                                      |
| E8163 | motor veh traffic accident due to loss of control, without collis on hwy - passenger on motorcycle                           |
| E8164 | motor veh traffic accident due to loss of control, without collis on hwy - occupant of streetcar                             |
| E8165 | motor veh traffic accident due to loss of control, without collis on hwy - rider of animal; occupant of animal-drawn vehicle |
| E8166 | motor veh traffic accident due to loss of control, without collis on hwy - pedal cyclist                                     |
| E8167 | motor veh traffic accident due to loss of control, without collis on hwy - pedestrian  |
| E8168 | motor veh traffic accident due to loss of control, without collis on hwy - other specified person                            |
| E8169 | motor veh traffic accident due to loss of control, without collis on hwy - unspecified person                                |
| E817  | noncollision motor vehicle traffic accident while boarding or alighting  |
| E8170 | noncollision motor vehicle traffic accident while boarding or alighting - driver of motor vehicle other than motorcycle      |
| E8171 | noncollision motor vehicle traffic accident while boarding or alighting - passenger in motor vehicle other than motorcycle   |
| E8172 | noncollision motor vehicle traffic accident while boarding or alighting - motorcyclist                                       |
| E8173 | noncollision motor vehicle traffic accident while boarding or alighting - passenger on motorcycle                            |
| E8174 | noncollision motor vehicle traffic accident while boarding or alighting - occupant of streetcar                              |
| E8175 | noncollision motor vehicle traffic accident while boarding or alighting - rider of animal; occupant of animal-drawn vehicle  |
| E8176 | noncollision motor vehicle traffic accident while boarding or alighting - pedal cyclist                                      |
| E8177 | noncollision motor vehicle traffic accident while boarding or alighting - pedestrian   |
| E8178 | noncollision motor vehicle traffic accident while boarding or alighting - other specified person                             |
| E8179 | noncollision motor vehicle traffic accident while boarding or alighting - unspecified person                                 |
| E818  | other noncollision motor vehicle traffic accident  |
| E8180 | other noncollision motor vehicle traffic accident - driver of motor vehicle other than motorcycle                            |
| E8181 | other noncollision motor vehicle traffic accident - passenger in motor vehicle other than motorcycle                         |
| E8182 | other noncollision motor vehicle traffic accident - motorcyclist   |
| E8183 | other noncollision motor vehicle traffic accident - passenger on motorcycle  |

|       |  |
|-------|--|
| E8184 | other noncollision motor vehicle traffic accident - occupant of streetcar                                |
| E8185 | other noncollision motor vehicle traffic accident - rider of animal; occupant of animal-drawn vehicle    |
| E8186 | other noncollision motor vehicle traffic accident - pedal cyclist  |
| E8187 | other noncollision motor vehicle traffic accident - pedestrian   |
| E8188 | other noncollision motor vehicle traffic accident - other specified person                               |
| E8189 | other noncollision motor vehicle traffic accident - unspecified person                                   |
| E819  | motor vehicle traffic accident of unspecified nature   |
| E8190 | motor vehicle traffic accident of unspecified nature - driver of motor vehicle other than motorcycle     |
| E8191 | motor vehicle traffic accident of unspecified nature - passenger in motor vehicle other than motorcycle  |
| E8192 | motor vehicle traffic accident of unspecified nature - motorcyclist                                      |
| E8193 | motor vehicle traffic accident of unspecified nature - passenger on motorcycle                           |
| E8194 | motor vehicle traffic accident of unspecified nature - occupant of streetcar                             |
| E8195 | motor vehicle traffic accident of unspecified nature - rider of animal; occupant of animal-drawn vehicle |
| E8196 | motor vehicle traffic accident of unspecified nature - pedal cyclist                                     |
| E8197 | motor vehicle traffic accident of unspecified nature - pedestrian  |
| E8198 | motor vehicle traffic accident of unspecified nature - other specified person                            |
| E8199 | motor vehicle traffic accident of unspecified nature - unspecified person                                |

# APPENDIX 4

## ABBREVIATIONS

## ABBREVIATIONS

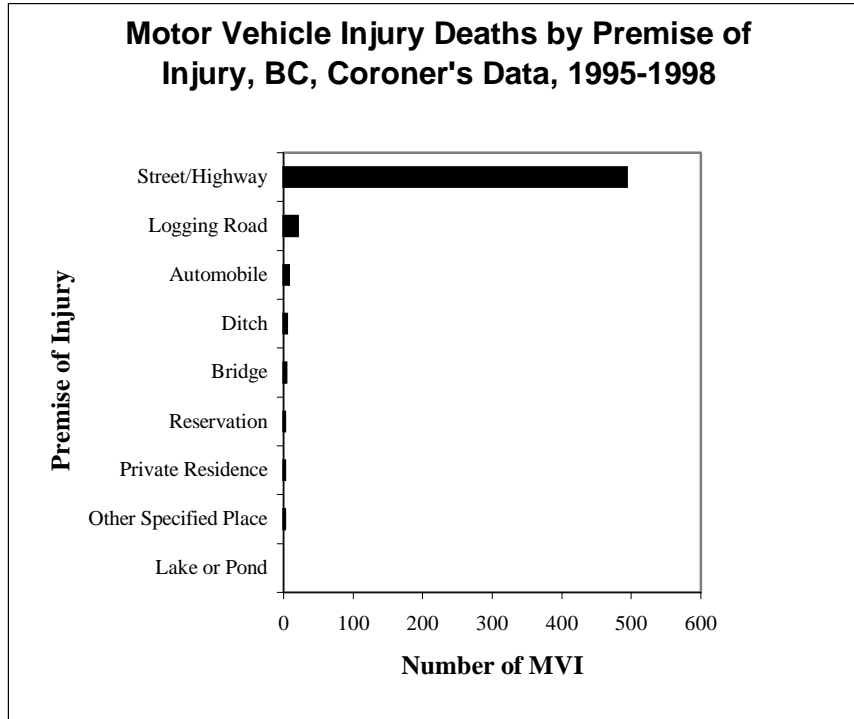
|        |  |
|--------|--|
| BCCH   | British Columbia Children's Hospital                       |
| CCMS   | Coroners Case Management System                            |
| CHIRPP | Canadian Hospitals Injury Reporting and Prevention Program |
| HR     | Health Region  |
| LARS   | LAN Accident Reporting System                              |
| LCDC   | Laboratory Centre for Disease Control                      |
| LHA    | Local Health Area  |
| SMR    | Standardized Mortality Ratios                              |
| MVTI   | Motor Vehicle Traffic Injury                               |
| MVA    | Motor Vehicle Accident                                     |
| 95%CI  | 95% Confidence Interval                                    |

## APPENDIX 5

- 1. Place of Occurrence of Death, BC Coroner's Data**
- 2. Death Frequencies by Police Detachment**
- 3. Death Frequencies by Case Injury Township**

## Place of Occurrence of Death, BC Coroner's Data

The figure below shows that 92 percent of the fatal MVTI occur on the street/highway followed by logging road (4%).



*Motor Vehicle Injury Deaths by Premise of Injury, 1995-1998, BC, Coroner's Data*

## Frequency of Deaths by Police Department

| Police Department   | Frequency | Percent |
|---------------------|-----------|---------|
| 100 Mile Det.       | 20        | 1.0     |
| Abbotsford Mun      | 32        | 1.6     |
| Agassiz Det.        | 8         | .4      |
| Alexis Creek Det.   | 10        | .5      |
| Anahim Lake Det.    | 5         | .3      |
| Armstrong Det.      | 8         | .4      |
| Ashcroft Det.       | 14        | .7      |
| Barriere Det.       | 14        | .7      |
| Bella Bella Det.    | 1         | .1      |
| Bella Coola Det.    | 1         | .1      |
| Boston Bar Det.     | 11        | .6      |
| Burnaby Det.        | 47        | 2.4     |
| Burns Lake Det.     | 9         | .5      |
| Campbell River Det. | 15        | .8      |
| Castlegar Det.      | 4         | .2      |
| Central Saanich Mun | 7         | .4      |
| Chase Det.          | 18        | .9      |
| Chemainus Det.      | 3         | .2      |
| Chetwynd Det.       | 10        | .5      |
| Chilliwack Det.     | 43        | 2.2     |
| Clearwater Det.     | 11        | .6      |
| Clinton Det.        | 17        | .9      |
| Coquitlam Det.      | 20        | 1.0     |
| Courtenay Det.      | 27        | 1.4     |
| Cranbrook Det.      | 12        | .6      |
| Creston Det.        | 14        | .7      |
| Dawson Creek Det.   | 12        | .6      |
| Dease HP            | 17        | .9      |
| Dease Lake Det.     | 5         | .3      |
| Delta Mun           | 24        | 1.2     |
| Duncan Det.         | 33        | 1.7     |
| Enderby Det.        | 8         | .4      |
| Falkland Det.       | 10        | .5      |
| Fernie Det.         | 8         | .4      |
| Field Det.          | 1         | .1      |
| Fort Nelson Det.    | 23        | 1.2     |
| Fort St. James Det. | 9         | .5      |
| Fort St. John Det.  | 30        | 1.5     |
| Fraser Lake Det.    | 5         | .3      |
| Galiano Island Det. | 1         | .1      |
| Gibsons Det.        | 5         | .3      |
| Gold River Det.     | 3         | .2      |
| Golden Det.         | 29        | 1.5     |
| Grand Forks Det.    | 8         | .4      |
| Granisle Det.       | 2         | .1      |

| <b>Police Department</b> | <b>Frequency</b> | <b>Percent</b> |
|--------------------------|------------------|----------------|
| Hope Det.                | 18               | .9             |
| Hope HP                  | 28               | 1.4            |
| Houston Det.             | 11               | .6             |
| Hudson Hope Det.         | 1                | .1             |
| Invermere Det.           | 5                | .3             |
| Kamloops Det.            | 58               | 3.0            |
| Kamloops HP              | 2                | .1             |
| Kaslo Det.               | 7                | .4             |
| Kelowna Det.             | 63               | 3.2            |
| Keremeos Det.            | 5                | .3             |
| Kimberley Det.           | 6                | .3             |
| Kitimat Det.             | 4                | .2             |
| Ladysmith Det.           | 4                | .2             |
| Lake Cowichan Det.       | 2                | .1             |
| Langley Det.             | 23               | 1.2            |
| Lillooet Det.            | 9                | .5             |
| Logan Lake Det.          | 3                | .2             |
| Lumby Det.               | 3                | .2             |
| Lytton Det.              | 15               | .8             |
| Mackenzie Det.           | 13               | .7             |
| Maple Ridge Det.         | 1                | .1             |
| Matsqui Det.             | 1                | .1             |
| McBride Det.             | 9                | .5             |
| Merritt Det.             | 35               | 1.8            |
| Midway Det.              | 3                | .2             |
| Mission Det.             | 17               | .9             |
| Nakusp Det.              | 6                | .3             |
| Nanaimo Det.             | 34               | 1.7            |
| Nelson Det.              | 19               | 1.0            |
| New Denver Det.          | 2                | .1             |
| New Hazelton Det.        | 9                | .5             |
| New Westminster Mun      | 14               | .7             |
| No police involved.      | 14               | .7             |
| North Vancouver Det.     | 10               | .5             |
| Oak Bay Mun              | 2                | .1             |
| Oliver Det.              | 11               | .6             |
| Osoyoos Det.             | 5                | .3             |
| Outer Gulf Islands       | 1                | .1             |
| Parksville Det.          | 27               | 1.4            |
| Pemberton Det.           | 11               | .6             |
| Penticton Det.           | 23               | 1.2            |
| Port Alberni Det.        | 17               | .9             |
| Port Alice Det.          | 1                | .1             |
| Port Hardy Det.          | 3                | .2             |
| Port Mann HP             | 16               | .8             |
| Port McNeill Det.        | 6                | .3             |
| Port Moody Mun           | 5                | .3             |

| <b>Police Department</b> | <b>Frequency</b> | <b>Percent</b> |
|--------------------------|------------------|----------------|
| Powell River Det.        | 2                | .1             |
| Prince George Det.       | 75               | 3.9            |
| Prince Rupert Det.       | 5                | .3             |
| Princeton Det.           | 8                | .4             |
| Quadra Island Det.       | 1                | .1             |
| Queen Charlotte Det.     | 1                | .1             |
| Quesnel Det.             | 32               | 1.6            |
| Radium Hot Spring De     | 2                | .1             |
| Revelstoke Det.          | 20               | 1.0            |
| Richmond Det.            | 29               | 1.5            |
| Ridge Meadows Det.       | 15               | .8             |
| Rossland Det.            | 3                | .2             |
| Saanich Mun              | 13               | .7             |
| Salmo Det.               | 10               | .5             |
| Salmon Arm Det.          | 19               | 1.0            |
| Saltspring Island De     | 1                | .1             |
| Sayward Det.             | 4                | .2             |
| Sechelt Det.             | 5                | .3             |
| Shawnigan Lake Det.      | 9                | .5             |
| Sicamous Det.            | 11               | .6             |
| Sidney Det.              | 1                | .1             |
| Smithers Det.            | 14               | .7             |
| Sointula Det.            | 1                | .1             |
| Sooke Det.               | 8                | .4             |
| Sparwood Det.            | 9                | .5             |
| Squamish Det.            | 26               | 1.3            |
| Stewart Det.             | 5                | .3             |
| Sumas HP                 | 20               | 1.0            |
| Summerland Det.          | 3                | .2             |
| Surrey Det.              | 87               | 4.5            |
| Telegraph Creek Det.     | 2                | .1             |
| Terrace Det.             | 16               | .8             |
| Teslin Det.              | 1                | .1             |
| Tofino Det.              | 5                | .3             |
| Trail Det.               | 4                | .2             |
| Tsa Keh Det.             | 2                | .1             |
| Tumbler Ridge Det.       | 3                | .2             |
| Ucluelet Det.            | 2                | .1             |
| University Det.          | 8                | .4             |
| Valemount Det.           | 17               | .9             |
| Vancouver Mun            | 125              | 6.4            |
| Vanderhoof Det.          | 13               | .7             |
| Vernon Det.              | 29               | 1.5            |
| Victoria Mun             | 5                | .3             |
| Watson Lake Det.         | 2                | .1             |
| West Vancouver Mun       | 12               | .6             |
| Western Communities      | 17               | .9             |

| <b>Police Department</b> | <b>Frequency</b> | <b>Percent</b> |
|--------------------------|------------------|----------------|
| Whistler Det.            | 6                | .3             |
| White Rock Det.          | 3                | .2             |
| Williams Lake Det.       | 36               | 1.9            |
| <b>Total</b>             | <b>1943</b>      | <b>100.0</b>   |

# APPENDIX 6

## **95% Confidence Intervals**

**Average Annual Age-Specific Mortality Rates per 100,000 and 95% Confidence Intervals, 1995-1998, BC., by Gender and Age Group**

| Age Group | Male  |             |             | Female |             |             |
|-----------|-------|-------------|-------------|--------|-------------|-------------|
|           | Rate  | Lower Limit | Upper Limit | Rate   | Lower Limit | Upper Limit |
| < 1       | 2.09  | 0           | 8.95        | 3.35   | 0           | 14.01       |
| 1-4       | 1.50  | 0           | 3.10        | 2.38   | 0.77        | 3.98        |
| 5-9       | 2.70  | 0.17        | 5.23        | 1.83   | 0           | 5.07        |
| 10-14     | 3.95  | 1.53        | 6.36        | 2.00   | 0.71        | 3.29        |
| 15-19     | 27.96 | 21.32       | 34.61       | 14.61  | 10.22       | 19.00       |
| 20-24     | 36.82 | 28.16       | 45.48       | 9.59   | 6.57        | 12.61       |
| 25-29     | 19.77 | 15.54       | 23.10       | 4.68   | 1.27        | 8.08        |
| 30-34     | 19.09 | 15.39       | 22.79       | 6.72   | 1.62        | 11.81       |
| 35-39     | 13.19 | 8.48        | 17.90       | 4.81   | 2.57        | 7.04        |
| 40-44     | 13.49 | 9.25        | 17.74       | 4.28   | 2.10        | 6.46        |
| 45-49     | 14.56 | 9.60        | 19.53       | 4.36   | 1.48        | 7.24        |
| 50-54     | 10.26 | 7.29        | 13.24       | 4.42   | 0.28        | 8.56        |
| 55-59     | 13.97 | 0           | 28.14       | 5.67   | 1.72        | 9.60        |
| 60-64     | 10.10 | 3.27        | 16.93       | 4.47   | 3.24        | 5.69        |
| 65-69     | 10.27 | 3.67        | 16.87       | 6.93   | 3.73        | 10.12       |
| 70-74     | 10.94 | 4.12        | 17.75       | 10.17  | 6.34        | 13.99       |
| 75-79     | 15.44 | 11.65       | 19.24       | 11.33  | 7.72        | 14.93       |
| 80-84     | 35.06 | 25.71       | 44.41       | 12.45  | 2.88        | 22.00       |
| 85+       | 35.73 | 5.98        | 65.48       | 15.55  | 3.24        | 27.86       |

**Average Annual Age-Standardized Mortality Rates per 100,000 and 95% Confidence Intervals, 1995-1998, BC., Males, by Health Region**

| <i>Health Region</i>       | Males Rate | Lower Limit | Upper Limit |
|----------------------------|------------|-------------|-------------|
| Cariboo                    | 42.56      | 16.95       | 68.18       |
| Northern Interior          | 33.46      | 27.34       | 39.58       |
| Peace Liard                | 30.04      | 8.79        | 51.28       |
| Thompson                   | 29.51      | 21.40       | 37.62       |
| North Okanagan             | 28.38      | 12.91       | 43.84       |
| North West                 | 27.00      | 15.77       | 38.22       |
| West Kootenay - Boundary   | 24.35      | 10.93       | 37.78       |
| Central Vancouver Island   | 21.66      | 8.09        | 35.23       |
| Fraser Valley              | 18.76      | 9.98        | 27.54       |
| Upper Island/Central Coast | 18.18      | 6.35        | 30.02       |
| South Okanagan Similkameen | 16.32      | 10.41       | 22.23       |
| Coast Garibaldi            | 15.93      | 4.63        | 27.23       |
| East Kootenay              | 14.30      | 0           | 30.61       |
| South Fraser Valley        | 12.75      | 10.38       | 15.12       |
| Burnaby                    | 11.58      | 5.30        | 17.87       |
| Simon Fraser               | 7.89       | 6.03        | 9.69        |
| Vancouver                  | 7.61       | 6.09        | 9.13        |
| Richmond                   | 7.52       | 2.56        | 12.48       |
| North Shore                | 7.01       | 4.35        | 9.67        |
| Capital                    | 5.95       | 0.62        | 11.28       |

**Average Annual Age-Standardized Mortality Rates per 100,000 and 95% Confidence Intervals, 1995-1998, BC., Females, by Health Region**

| <i>Health Region</i>              | <b>Females</b> |              |              |
|-----------------------------------|----------------|--------------|--------------|
|                                   | Rate           | Lower Limit  | Upper Limit  |
| <b>Cariboo</b>                    | <b>20.14</b>   | <b>10.22</b> | <b>30.07</b> |
| <b>East Kootenay</b>              | <b>15.31</b>   | <b>0</b>     | <b>37.71</b> |
| <b>Peace Liard</b>                | <b>14.48</b>   | <b>0</b>     | <b>29.72</b> |
| <b>West Kootenay - Boundary</b>   | <b>13.50</b>   | <b>11.48</b> | <b>15.52</b> |
| <b>Thompson</b>                   | <b>13.13</b>   | <b>3.48</b>  | <b>22.78</b> |
| <b>Northern Interior</b>          | <b>11.93</b>   | <b>4.47</b>  | <b>19.39</b> |
| <b>North Okanagan</b>             | <b>10.43</b>   | <b>2.13</b>  | <b>18.72</b> |
| <b>North West</b>                 | <b>8.07</b>    | <b>1.77</b>  | <b>14.38</b> |
| <b>Fraser Valley</b>              | <b>8.02</b>    | <b>3.43</b>  | <b>12.61</b> |
| <b>Coast Garibaldi</b>            | <b>7.71</b>    | <b>0</b>     | <b>17.14</b> |
| <b>Central Vancouver Island</b>   | <b>7.67</b>    | <b>1.01</b>  | <b>14.34</b> |
| <b>South Okanagan Similkameen</b> | <b>5.98</b>    | <b>1.19</b>  | <b>10.76</b> |
| <b>Upper Island/Central Coast</b> | <b>5.53</b>    | <b>4.10</b>  | <b>6.97</b>  |
| <b>Richmond</b>                   | <b>4.70</b>    | <b>3.70</b>  | <b>5.71</b>  |
| <b>South Fraser Valley</b>        | <b>4.63</b>    | <b>2.05</b>  | <b>7.21</b>  |
| <b>North Shore</b>                | <b>4.39</b>    | <b>0.03</b>  | <b>8.75</b>  |
| <b>Vancouver</b>                  | <b>4.06</b>    | <b>1.15</b>  | <b>6.97</b>  |
| <b>Burnaby</b>                    | <b>3.69</b>    | <b>1.60</b>  | <b>5.78</b>  |
| <b>Capital</b>                    | <b>3.34</b>    | <b>1.01</b>  | <b>5.68</b>  |
| <b>Simon Fraser</b>               | <b>2.61</b>    | <b>0.26</b>  | <b>4.95</b>  |

**Average Annual Age-Standardized Mortality Rates per 100,000 and 95% Confidence Intervals, 1995-1998, BC., by External Cause of Injury and Gender**

| Injury Category                       | <i>Males</i> |             |             | <i>Females</i> |             |             |
|---------------------------------------|--------------|-------------|-------------|----------------|-------------|-------------|
|                                       | Rate         | Lower Limit | Upper Limit | Rate           | Lower Limit | Upper Limit |
| MV-Train                              | <b>.09</b>   | <b>0</b>    | <b>0.33</b> | <b>.04</b>     | <b>0</b>    | <b>0.12</b> |
| MV- Re-entrant                        | <b>.03</b>   | <b>0</b>    | <b>7.16</b> | <b>.00</b>     | <b>.00</b>  | <b>.00</b>  |
| Another MV-<br>Another MV             | <b>3.95</b>  | <b>3.25</b> | <b>4.64</b> | <b>2.11</b>    | <b>1.46</b> | <b>2.75</b> |
| MV- other<br>vehicle                  | <b>.33</b>   | <b>0.13</b> | <b>0.54</b> | <b>.04</b>     | <b>0</b>    | <b>0.11</b> |
| MV- Pedestrian                        | <b>2.01</b>  | <b>1.52</b> | <b>2.50</b> | <b>1.05</b>    | <b>0.57</b> | <b>1.53</b> |
| Other MV-<br>highway                  | <b>.89</b>   | <b>0.35</b> | <b>1.43</b> | <b>.27</b>     | <b>0.09</b> | <b>0.45</b> |
| MV- w/o colls<br>on highway           | <b>4.19</b>  | <b>3.10</b> | <b>5.29</b> | <b>1.32</b>    | <b>0.91</b> | <b>1.73</b> |
| Noncollision<br>MVA while<br>boarding | <b>.05</b>   | <b>0</b>    | <b>0.12</b> | <b>0</b>       | <b>0</b>    | <b>0</b>    |
| Other<br>noncollision<br>MVA          | <b>.32</b>   | <b>0</b>    | <b>0.66</b> | <b>.06</b>     | <b>0</b>    | <b>0.14</b> |
| MVA of<br>unspecified<br>nature       | <b>3.35</b>  | <b>2.38</b> | <b>4.32</b> | <b>1.34</b>    | <b>1.07</b> | <b>1.60</b> |

**Average Annual Standardized Mortality Ratios and 95% Confidence Intervals, 1995-1998, Males, BC., by Health Region**

| <i>Health Region</i>              | <b>Males</b> |             |             |
|-----------------------------------|--------------|-------------|-------------|
|                                   | SMR          | Lower Limit | Upper Limit |
| <b>Cariboo</b>                    | <b>2.85</b>  | <b>1.13</b> | <b>4.56</b> |
| <b>Northern Interior</b>          | <b>2.24</b>  | <b>1.83</b> | <b>2.65</b> |
| <b>Peace Liard</b>                | <b>2.01</b>  | <b>0.59</b> | <b>3.43</b> |
| <b>Thompson</b>                   | <b>1.97</b>  | <b>1.43</b> | <b>2.52</b> |
| <b>North Okanagan</b>             | <b>1.90</b>  | <b>0.86</b> | <b>2.93</b> |
| <b>North West</b>                 | <b>1.81</b>  | <b>1.05</b> | <b>2.56</b> |
| <b>West Kootenay - Boundary</b>   | <b>1.63</b>  | <b>0.73</b> | <b>2.53</b> |
| <b>Central Vancouver Island</b>   | <b>1.45</b>  | <b>0.54</b> | <b>2.36</b> |
| <b>Fraser Valley</b>              | <b>1.25</b>  | <b>0.67</b> | <b>1.84</b> |
| <b>Upper Island/Central Coast</b> | <b>1.22</b>  | <b>0.42</b> | <b>2.01</b> |
| <b>South Okanagan Similkameen</b> | <b>1.09</b>  | <b>0.70</b> | <b>1.49</b> |
| <b>Coast Garibaldi</b>            | <b>1.07</b>  | <b>0.31</b> | <b>1.82</b> |
| <b>East Kootenay</b>              | <b>0.96</b>  | <b>0</b>    | <b>2.05</b> |
| <b>South Fraser Valley</b>        | <b>0.85</b>  | <b>0.69</b> | <b>1.01</b> |
| <b>Burnaby</b>                    | <b>0.77</b>  | <b>0.35</b> | <b>1.19</b> |
| <b>Simon Fraser</b>               | <b>0.53</b>  | <b>0.41</b> | <b>0.65</b> |
| <b>Vancouver</b>                  | <b>0.51</b>  | <b>0.41</b> | <b>0.61</b> |
| <b>Richmond</b>                   | <b>0.50</b>  | <b>0.17</b> | <b>0.83</b> |
| <b>North Shore</b>                | <b>0.47</b>  | <b>0.29</b> | <b>0.65</b> |
| <b>Capital</b>                    | <b>0.40</b>  | <b>0.04</b> | <b>0.75</b> |

**Average Annual Standardized Mortality Ratios and 95% Confidence Intervals, 1995-1998, Females, BC., by Health Region**

| <i>Health Region</i>              | <b>Females</b> |             |             |
|-----------------------------------|----------------|-------------|-------------|
|                                   | SMR            | Lower Limit | Upper Limit |
| <b>Cariboo</b>                    | <b>3.27</b>    | <b>1.66</b> | <b>4.89</b> |
| <b>East Kootenay</b>              | <b>2.49</b>    | <b>0</b>    | <b>6.13</b> |
| <b>Peace Liard</b>                | <b>2.35</b>    | <b>0</b>    | <b>4.83</b> |
| <b>West Kootenay - Boundary</b>   | <b>2.19</b>    | <b>1.87</b> | <b>2.52</b> |
| <b>Thompson</b>                   | <b>2.13</b>    | <b>0.57</b> | <b>3.70</b> |
| <b>Northern Interior</b>          | <b>1.94</b>    | <b>0.73</b> | <b>3.15</b> |
| <b>North Okanagan</b>             | <b>1.69</b>    | <b>0.35</b> | <b>3.04</b> |
| <b>North West</b>                 | <b>1.31</b>    | <b>0.29</b> | <b>2.34</b> |
| <b>Fraser Valley</b>              | <b>1.30</b>    | <b>0.56</b> | <b>2.05</b> |
| <b>Coast Garibaldi</b>            | <b>1.25</b>    | <b>0</b>    | <b>2.78</b> |
| <b>Central Vancouver Island</b>   | <b>1.25</b>    | <b>0.16</b> | <b>2.33</b> |
| <b>South Okanagan Similkameen</b> | <b>0.97</b>    | <b>0.19</b> | <b>1.75</b> |
| <b>Upper Island/Central Coast</b> | <b>0.90</b>    | <b>0.67</b> | <b>1.13</b> |
| <b>Richmond</b>                   | <b>0.76</b>    | <b>0.60</b> | <b>0.93</b> |
| <b>South Fraser Valley</b>        | <b>0.75</b>    | <b>0.33</b> | <b>1.17</b> |
| <b>North Shore</b>                | <b>0.71</b>    | <b>0.04</b> | <b>1.42</b> |
| <b>Vancouver</b>                  | <b>0.66</b>    | <b>0.19</b> | <b>1.13</b> |
| <b>Burnaby</b>                    | <b>0.60</b>    | <b>0.26</b> | <b>0.94</b> |
| <b>Capital</b>                    | <b>0.54</b>    | <b>0.16</b> | <b>0.92</b> |
| <b>Simon Fraser</b>               | <b>0.42</b>    | <b>0.04</b> | <b>0.80</b> |

Average Annual Age-Specific Mortality Rates per 100,000 and 95% Confidence Intervals, 1995-1998, BC., by Gender and Age Group, BC Coroner's data.

| Age Group | Male  |             |             | Female |             |             |
|-----------|-------|-------------|-------------|--------|-------------|-------------|
|           | Rate  | Lower Limit | Upper Limit | Rate   | Lower Limit | Upper Limit |
| < 1       | 2.09  | 0           | 8.75        | 5.55   | 0           | 16.17       |
| 1-4       | 1.50  | 0.58        | 2.43        | 2.38   | 0.77        | 3.98        |
| 5-9       | 2.89  | 0.83        | 4.96        | 1.83   | 0           | 5.07        |
| 10-14     | 4.92  | 0.67        | 9.17        | 2.01   | 0           | 4.50        |
| 15-19     | 34.87 | 26.70       | 43.05       | 18.30  | 10.74       | 25.87       |
| 20-24     | 47.02 | 32.30       | 61.74       | 13.90  | 7.84        | 19.96       |
| 25-29     | 26.11 | 16.97       | 35.25       | 5.02   | 0.60        | 9.44        |
| 30-34     | 22.68 | 17.64       | 27.71       | 8.57   | 3.27        | 13.87       |
| 35-39     | 15.42 | 7.06        | 23.78       | 5.24   | 2.72        | 7.77        |
| 40-44     | 15.65 | 11.74       | 19.55       | 4.60   | 3.21        | 5.98        |
| 45-49     | 17.80 | 12.96       | 22.64       | 6.24   | 1.60        | 10.88       |
| 50-54     | 13.98 | 10.84       | 17.12       | 5.51   | 0.05        | 10.96       |
| 55-59     | 18.49 | 0.65        | 36.32       | 6.24   | 2.84        | 9.64        |
| 60-64     | 11.36 | 5.35        | 17.37       | 6.06   | 4.93        | 7.20        |
| 65-69     | 17.79 | 0.56        | 35.03       | 9.58   | 2.70        | 16.47       |
| 70-74     | 15.15 | 4.59        | 25.72       | 17.89  | 5.64        | 30.14       |
| 75-79     | 25.01 | 12.18       | 37.83       | 14.34  | 8.66        | 20.03       |
| 80-84     | 53.56 | 33.25       | 73.88       | 16.28  | 0           | 33.07       |
| 85+       | 51.83 | 8.13        | 95.53       | 22.15  | 3.87        | 40.44       |

Average Annual Age-Standardized Mortality Rates per 100,000 and 95% Confidence Intervals, 1995-1998, BC., Males, by Health Region, BC Coroner's data.

| <i>Health Region</i>       | Males |             |             |
|----------------------------|-------|-------------|-------------|
|                            | Rate  | Lower Limit | Upper Limit |
| Thompson                   | 66.22 | 42.23       | 90.21       |
| Peace Liard                | 56.95 | 29.03       | 84.86       |
| Cariboo                    | 49.43 | 29.57       | 69.30       |
| Northern Interior          | 45.87 | 27.93       | 63.81       |
| East Kootenay              | 42.19 | 11.35       | 73.02       |
| North Okanagan             | 38.93 | 20.31       | 57.55       |
| North West                 | 33.92 | 16.74       | 51.09       |
| West Kootenay - Boundary   | 29.88 | 23.51       | 36.25       |
| Central Vancouver Island   | 26.18 | 7.59        | 44.78       |
| Coast Garibaldi            | 25.67 | 13.90       | 37.44       |
| South Okanagan Similkameen | 21.81 | 12.50       | 31.13       |
| Fraser Valley              | 21.76 | 6.11        | 37.40       |
| Upper Island/Central Coast | 19.77 | 10.72       | 28.83       |
| Burnaby                    | 11.04 | 0           | 22.47       |
| South Fraser Valley        | 9.76  | 5.22        | 14.31       |
| Vancouver                  | 9.12  | 3.67        | 14.56       |
| Simon Fraser               | 6.53  | 3.04        | 10.01       |
| Richmond                   | 6.49  | 1.18        | 11.80       |
| Capital                    | 4.69  | 0.61        | 8.76        |
| North Shore                | 3.22  | 0.86        | 5.58        |

Average Annual Age-Standardized Mortality Rates per 100,000 and 95% Confidence Intervals, 1995-1998, BC., Females, by Health Region, BC Coroner's data.

| <i>Health Region</i>       | Females Rate | Lower Limit | Upper Limit |
|----------------------------|--------------|-------------|-------------|
| Thompson                   | 25.82        | 11.82       | 39.83       |
| Cariboo                    | 25.04        | 18.59       | 31.49       |
| Peace Liard                | 20.78        | 5.66        | 35.91       |
| East Kootenay              | 19.74        | 11.03       | 28.45       |
| Northern Interior          | 18.38        | 4.59        | 32.18       |
| North Okanagan             | 15.28        | 1.44        | 29.12       |
| West Kootenay - Boundary   | 14.10        | 9.39        | 18.80       |
| Coast Garibaldi            | 12.46        | 5.97        | 18.95       |
| North West                 | 12.13        | 1.54        | 22.72       |
| Fraser Valley              | 9.09         | 6.15        | 12.03       |
| Central Vancouver Island   | 8.36         | 0           | 19.02       |
| South Okanagan Similkameen | 7.71         | 2.95        | 12.47       |
| Upper Island/Central Coast | 6.35         | 4.03        | 8.67        |
| Vancouver                  | 5.13         | 0           | 10.52       |
| Capital                    | 3.92         | 0.58        | 7.27        |
| South Fraser Valley        | 3.89         | 1.03        | 6.76        |
| Richmond                   | 3.44         | 2.57        | 4.30        |
| Burnaby                    | 3.17         | 0.12        | 6.22        |
| North Shore                | 3.01         | 0.78        | 5.24        |
| Simon Fraser               | 2.76         | 0           | 6.09        |

Average Annual Standardized Mortality Ratios and 95% Confidence Intervals, 1995-1998, Males, BC., by Health Region, BC Coroner's data.

| <i>Health Region</i>       | Males SMR | Lower Limit | Upper Limit |
|----------------------------|-----------|-------------|-------------|
| Thompson                   | 3.48      | 2.22        | 4.74        |
| Peace Liard                | 2.99      | 1.52        | 4.46        |
| Cariboo                    | 2.60      | 1.55        | 3.64        |
| Northern Interior          | 2.41      | 1.47        | 3.35        |
| East Kootenay              | 2.21      | 0.60        | 3.83        |
| North Okanagan             | 2.04      | 1.07        | 3.02        |
| North West                 | 1.78      | 0.88        | 2.68        |
| West Kootenay - Boundary   | 1.57      | 1.23        | 1.90        |
| Central Vancouver Island   | 1.37      | 0.40        | 2.35        |
| Coast Garibaldi            | 1.35      | 0.73        | 1.97        |
| South Okanagan Similkameen | 1.15      | 0.66        | 1.63        |
| Fraser Valley              | 1.14      | 0.32        | 1.96        |
| Upper Island/Central Coast | 1.04      | 0.56        | 1.51        |
| Burnaby                    | 0.58      | 0           | 1.18        |
| South Fraser Valley        | 0.51      | 0.27        | 0.75        |
| Vancouver                  | 0.48      | 0.19        | 0.76        |
| Richmond                   | 0.34      | 0.06        | 0.62        |
| Simon Fraser               | 0.34      | 0.16        | 0.53        |
| Capital                    | 0.25      | 0.03        | 0.46        |
| North Shore                | 0.17      | 0           | 0.29        |

**Average Annual Standardized Mortality Ratios and 95% Confidence Intervals, 1995-1998, Females, BC., by Health Region**

| <i>Health Region</i>              | <b>Females</b> |             |             |
|-----------------------------------|----------------|-------------|-------------|
|                                   | SMR            | Lower Limit | Upper Limit |
| <b>Thompson</b>                   | <b>3.30</b>    | <b>1.52</b> | <b>5.08</b> |
| <b>Cariboo</b>                    | <b>3.20</b>    | <b>2.37</b> | <b>4.02</b> |
| <b>Peace Liard</b>                | <b>2.65</b>    | <b>0.72</b> | <b>4.58</b> |
| <b>East Kootenay</b>              | <b>2.52</b>    | <b>1.41</b> | <b>3.63</b> |
| <b>Northern Interior</b>          | <b>2.35</b>    | <b>0.59</b> | <b>4.11</b> |
| <b>North Okanagan</b>             | <b>1.95</b>    | <b>0.18</b> | <b>3.72</b> |
| <b>West Kootenay - Boundary</b>   | <b>1.80</b>    | <b>1.20</b> | <b>2.40</b> |
| <b>Coast Garibaldi</b>            | <b>1.59</b>    | <b>0.76</b> | <b>2.42</b> |
| <b>North West</b>                 | <b>1.55</b>    | <b>0.20</b> | <b>2.90</b> |
| <b>Fraser Valley</b>              | <b>1.16</b>    | <b>0.79</b> | <b>1.54</b> |
| <b>Central Vancouver Island</b>   | <b>1.07</b>    | <b>0</b>    | <b>2.43</b> |
| <b>South Okanagan Similkameen</b> | <b>0.98</b>    | <b>0.38</b> | <b>1.59</b> |
| <b>Upper Island/Central Coast</b> | <b>0.81</b>    | <b>0.51</b> | <b>1.12</b> |
| <b>Vancouver</b>                  | <b>0.66</b>    | <b>0</b>    | <b>1.34</b> |
| <b>South Fraser Valley</b>        | <b>0.50</b>    | <b>0.13</b> | <b>0.86</b> |
| <b>Capital</b>                    | <b>0.50</b>    | <b>0.07</b> | <b>0.93</b> |
| <b>Richmond</b>                   | <b>0.44</b>    | <b>0.33</b> | <b>0.55</b> |
| <b>Burnaby</b>                    | <b>0.40</b>    | <b>0.01</b> | <b>0.79</b> |
| <b>North Shore</b>                | <b>0.38</b>    | <b>0.10</b> | <b>0.67</b> |
| <b>Simon Fraser</b>               | <b>0.35</b>    | <b>0</b>    | <b>0.78</b> |

**Average Annual Age-Specific Hospitalisation Separation Rates per 100,000 and 95% Confidence Intervals, 1995-1998, BC., by Gender and Age Group, BC Coroner's data.**

| Age Group | Male   |             |             | Female |             |             |
|-----------|--------|-------------|-------------|--------|-------------|-------------|
|           | Rate   | Lower Limit | Upper Limit | Rate   | Lower Limit | Upper Limit |
| < 1       | 15.57  | 0           | 32.25       | 15.38  | 8.94        | 21.83       |
| 1-4       | 37.76  | 24.58       | 50.93       | 23.50  | 7.67        | 39.32       |
| 5-9       | 54.48  | 44.34       | 64.63       | 38.46  | 32.12       | 44.81       |
| 10-14     | 80.45  | 44.33       | 116.57      | 60.46  | 47.80       | 73.12       |
| 15-19     | 331.27 | 265.80      | 396.75      | 239.52 | 196.58      | 282.46      |
| 20-24     | 347.90 | 288.38      | 407.43      | 167.33 | 122.19      | 212.48      |
| 25-29     | 223.33 | 198.67      | 248.00      | 114.39 | 88.30       | 140.48      |
| 30-34     | 188.79 | 145.60      | 231.98      | 100.50 | 72.02       | 128.99      |
| 35-39     | 157.27 | 129.85      | 184.69      | 80.83  | 63.56       | 98.09       |
| 40-44     | 150.57 | 144.45      | 156.69      | 73.20  | 59.89       | 86.50       |
| 45-49     | 125.72 | 115.45      | 136.00      | 73.55  | 60.62       | 86.48       |
| 50-54     | 134.54 | 109.91      | 159.16      | 79.63  | 49.58       | 109.67      |
| 55-59     | 117.78 | 113.81      | 121.75      | 93.59  | 70.15       | 117.04      |
| 60-64     | 106.22 | 94.63       | 117.81      | 98.17  | 83.78       | 112.55      |
| 65-69     | 116.79 | 93.78       | 139.80      | 104.84 | 81.57       | 128.11      |
| 70-74     | 132.72 | 114.59      | 150.84      | 129.99 | 107.60      | 152.37      |
| 75-79     | 156.76 | 97.18       | 216.34      | 152.11 | 102.10      | 202.11      |
| 80-84     | 202.24 | 169.77      | 234.70      | 159.45 | 115.35      | 203.55      |
| 85+       | 183.27 | 145.86      | 220.67      | 122.80 | 94.61       | 151.00      |

**Average Annual Age-Standardised Hospitalisation Separation Rates per 100,000 and 95% Confidence Intervals, 1995-1998, BC., Males, by Health Region**

| <i>Health Region</i>       | Males Rate | Lower Limit | Upper Limit |
|----------------------------|------------|-------------|-------------|
| Cariboo                    | 392.65     | 337.33      | 447.98      |
| Peace Liard                | 271.89     | 186.81      | 356.98      |
| Northern Interior          | 257.15     | 180.37      | 333.94      |
| West Kootenay - Boundary   | 257.13     | 191.65      | 322.61      |
| North Okanagan             | 255.10     | 232.35      | 277.85      |
| North West                 | 252.16     | 180.57      | 323.74      |
| East Kootenay              | 248.39     | 133.11      | 363.67      |
| Upper Island/Central Coast | 235.71     | 181.39      | 290.03      |
| Thompson                   | 226.92     | 206.41      | 247.42      |
| Coast Garibaldi            | 212.52     | 134.16      | 290.87      |
| Central Vancouver Island   | 169.03     | 134.55      | 203.51      |
| South Okanagan Similkameen | 166.00     | 123.90      | 208.10      |
| Fraser Valley              | 164.19     | 138.00      | 190.38      |
| South Fraser Valley        | 134.84     | 114.56      | 155.12      |
| Vancouver                  | 120.39     | 113.28      | 127.50      |
| Simon Fraser               | 119.67     | 111.66      | 127.68      |
| Burnaby                    | 112.11     | 104.33      | 119.89      |
| Capital                    | 103.36     | 73.72       | 133.00      |
| Richmond                   | 96.85      | 76.48       | 117.23      |
| North Shore                | 76.85      | 57.54       | 96.17       |

**Average Annual Age-Standardised Hospitalisation Separation Rates per 100,000 and 95% Confidence Intervals, 1995-1998, BC., Females, by Health Region**

| <i>Health Region</i>              | <b>Females Rate</b> | <b>Lower Limit</b> | <b>Upper Limit</b> |
|-----------------------------------|---------------------|--------------------|--------------------|
| <b>Cariboo</b>                    | <b>239.52</b>       | <b>203.23</b>      | <b>275.82</b>      |
| <b>North West</b>                 | <b>192.23</b>       | <b>153.72</b>      | <b>230.75</b>      |
| <b>West Kootenay - Boundary</b>   | <b>165.29</b>       | <b>128.60</b>      | <b>201.98</b>      |
| <b>Thompson</b>                   | <b>158.85</b>       | <b>76.76</b>       | <b>240.95</b>      |
| <b>Northern Interior</b>          | <b>155.99</b>       | <b>128.65</b>      | <b>183.32</b>      |
| <b>East Kootenay</b>              | <b>146.60</b>       | <b>81.16</b>       | <b>212.05</b>      |
| <b>Peace Liard</b>                | <b>143.01</b>       | <b>127.57</b>      | <b>158.44</b>      |
| <b>Upper Island/Central Coast</b> | <b>130.54</b>       | <b>75.27</b>       | <b>185.81</b>      |
| <b>North Okanagan</b>             | <b>129.81</b>       | <b>75.95</b>       | <b>183.68</b>      |
| <b>Central Vancouver Island</b>   | <b>118.40</b>       | <b>67.90</b>       | <b>168.90</b>      |
| <b>Coast Garibaldi</b>            | <b>112.19</b>       | <b>87.58</b>       | <b>136.81</b>      |
| <b>South Okanagan Similkameen</b> | <b>104.88</b>       | <b>89.18</b>       | <b>120.59</b>      |
| <b>Fraser Valley</b>              | <b>104.66</b>       | <b>84.75</b>       | <b>124.57</b>      |
| <b>Vancouver</b>                  | <b>84.39</b>        | <b>73.40</b>       | <b>95.37</b>       |
| <b>Burnaby</b>                    | <b>84.11</b>        | <b>49.56</b>       | <b>118.66</b>      |
| <b>Simon Fraser</b>               | <b>76.01</b>        | <b>61.25</b>       | <b>90.78</b>       |
| <b>Capital</b>                    | <b>65.22</b>        | <b>41.97</b>       | <b>88.47</b>       |
| <b>South Fraser Valley</b>        | <b>64.83</b>        | <b>0</b>           | <b>133.66</b>      |
| <b>Richmond</b>                   | <b>63.91</b>        | <b>52.41</b>       | <b>75.42</b>       |
| <b>North Shore</b>                | <b>58.76</b>        | <b>51.59</b>       | <b>65.93</b>       |

**Average Annual Age-Standardized Hospital Separation Rates per 100,000 and 95% Confidence Intervals, 1995-1998, BC, by External Cause of Injury and Gender**

| <b>Injury Category</b>                 | <i>Males</i> |                    |                    | <i>Females</i> |                    |                    |
|--|--------------|--------------------|--------------------|----------------|--------------------|--------------------|
|  | <b>Rate</b>  | <b>Lower Limit</b> | <b>Upper Limit</b> | <b>Rate</b>    | <b>Lower Limit</b> | <b>Upper Limit</b> |
| <b>MV-Train</b>                        | <b>.21</b>   | <b>0</b>           | <b>0.51</b>        | <b>0.10</b>    | <b>0</b>           | <b>0.33</b>        |
| <b>MV- Re-entrant</b>                  | <b>.49</b>   | <b>0.18</b>        | <b>0.80</b>        | <b>0.42</b>    | <b>0.10</b>        | <b>0.74</b>        |
| <b>Another MV- Another MV</b>          | <b>47.94</b> | <b>31.47</b>       | <b>64.41</b>       | <b>37.39</b>   | <b>24.91</b>       | <b>49.88</b>       |
| <b>MV- other vehicle</b>               | <b>9.46</b>  | <b>5.62</b>        | <b>13.29</b>       | <b>3.61</b>    | <b>1.85</b>        | <b>5.37</b>        |
| <b>MV- Pedestrian</b>                  | <b>19.54</b> | <b>16.61</b>       | <b>22.46</b>       | <b>15.93</b>   | <b>12.68</b>       | <b>19.19</b>       |
| <b>Other MV- highway</b>               | <b>9.77</b>  | <b>6.37</b>        | <b>13.18</b>       | <b>4.65</b>    | <b>2.56</b>        | <b>6.74</b>        |
| <b>MV- w/o colls on highway</b>        | <b>56.37</b> | <b>31.11</b>       | <b>81.63</b>       | <b>28.24</b>   | <b>14.55</b>       | <b>41.93</b>       |
| <b>Noncollision MVA while boarding</b> | <b>1.75</b>  | <b>1.05</b>        | <b>2.46</b>        | <b>2.37</b>    | <b>2.01</b>        | <b>2.72</b>        |
| <b>Other noncollision MVA</b>          | <b>7.13</b>  | <b>4.28</b>        | <b>9.99</b>        | <b>2.96</b>    | <b>1.29</b>        | <b>4.63</b>        |
| <b>MVA of unspecified nature</b>       | <b>7.97</b>  | <b>3.90</b>        | <b>12.04</b>       | <b>4.75</b>    | <b>2.37</b>        | <b>7.13</b>        |

**Average Annual Age-Standardized Hospital Separation Rates per 100,000 and 95% Confidence Intervals, 1995-1998, BC, by External Cause of Injury and Gender**

| <i>Injury Category</i> | <b>Males</b> |              |               | <b>Females</b> |              |              |
|------------------------|--------------|--------------|---------------|----------------|--------------|--------------|
|                        | Rate         | Lower Limit  | Upper Limit   | Rate           | Lower Limit  | Upper Limit  |
| MV-Occupant            | <b>108.2</b> | <b>89.96</b> | <b>126.44</b> | <b>75.6</b>    | <b>63.87</b> | <b>87.37</b> |
| MV-Motorcyclist        | <b>19.9</b>  | <b>18.34</b> | <b>21.40</b>  | <b>3.2</b>     | <b>2.35</b>  | <b>4.04</b>  |
| MV-Pedal Cyclist       | <b>6.7</b>   | <b>4.70</b>  | <b>8.67</b>   | <b>1.7</b>     | <b>1.03</b>  | <b>2.28</b>  |
| MV-Pedestrian          | <b>21.8</b>  | <b>15.10</b> | <b>28.58</b>  | <b>16.8</b>    | <b>13.19</b> | <b>20.51</b> |
| MV-Unspecified         | <b>3.7</b>   | <b>3.13</b>  | <b>4.30</b>   | <b>3.0</b>     | <b>2.69</b>  | <b>3.28</b>  |

**Average Annual Standardized Morbidity Ratios and 95% Confidence Intervals, 1995-1998, Males, BC., by Health Region**

| <i>Health Region</i>              | <b>Males</b> |             |             |
|-----------------------------------|--------------|-------------|-------------|
|                                   | SMR          | Lower Limit | Upper Limit |
| <b>Cariboo</b>                    | <b>2.45</b>  | <b>2.11</b> | <b>2.80</b> |
| <b>Peace Liard</b>                | <b>1.70</b>  | <b>1.17</b> | <b>2.23</b> |
| <b>West Kootenay - Boundary</b>   | <b>1.61</b>  | <b>1.20</b> | <b>2.02</b> |
| <b>Northern Interior</b>          | <b>1.61</b>  | <b>1.13</b> | <b>2.09</b> |
| <b>North Okanagan</b>             | <b>1.59</b>  | <b>1.45</b> | <b>1.74</b> |
| <b>North West</b>                 | <b>1.58</b>  | <b>1.13</b> | <b>2.02</b> |
| <b>East Kootenay</b>              | <b>1.55</b>  | <b>0.83</b> | <b>2.27</b> |
| <b>Upper Island/Central Coast</b> | <b>1.47</b>  | <b>1.13</b> | <b>1.81</b> |
| <b>Thompson</b>                   | <b>1.42</b>  | <b>1.29</b> | <b>1.55</b> |
| <b>Coast Garibaldi</b>            | <b>1.33</b>  | <b>0.84</b> | <b>1.82</b> |
| <b>Central Vancouver Island</b>   | <b>1.06</b>  | <b>0.84</b> | <b>1.27</b> |
| <b>South Okanagan Similkameen</b> | <b>1.04</b>  | <b>0.77</b> | <b>1.30</b> |
| <b>Fraser Valley</b>              | <b>1.03</b>  | <b>0.86</b> | <b>1.19</b> |
| <b>South Fraser Valley</b>        | <b>0.84</b>  | <b>0.72</b> | <b>0.97</b> |
| <b>Simon Fraser</b>               | <b>0.75</b>  | <b>0.70</b> | <b>0.80</b> |
| <b>Vancouver</b>                  | <b>0.75</b>  | <b>0.71</b> | <b>0.80</b> |
| <b>Burnaby</b>                    | <b>0.70</b>  | <b>0.65</b> | <b>0.75</b> |
| <b>Capital</b>                    | <b>0.65</b>  | <b>0.46</b> | <b>0.83</b> |
| <b>Richmond</b>                   | <b>0.61</b>  | <b>0.48</b> | <b>0.73</b> |
| <b>North Shore</b>                | <b>0.48</b>  | <b>0.36</b> | <b>0.60</b> |

**Average Annual Standardized Morbidity Ratios and 95% Confidence Intervals, 1995-1998, Females, BC., by Health Region**

| <i>Health Region</i>              | <b>Females</b> |             |             |
|-----------------------------------|----------------|-------------|-------------|
|                                   | SMR            | Lower Limit | Upper Limit |
| <b>Cariboo</b>                    | <b>2.39</b>    | <b>2.03</b> | <b>2.76</b> |
| <b>North West</b>                 | <b>1.92</b>    | <b>1.54</b> | <b>2.30</b> |
| <b>West Kootenay - Boundary</b>   | <b>1.65</b>    | <b>1.28</b> | <b>2.02</b> |
| <b>Thompson</b>                   | <b>1.59</b>    | <b>0.77</b> | <b>2.41</b> |
| <b>Northern Interior</b>          | <b>1.56</b>    | <b>1.29</b> | <b>1.83</b> |
| <b>East Kootenay</b>              | <b>1.46</b>    | <b>0.81</b> | <b>2.12</b> |
| <b>Peace Liard</b>                | <b>1.43</b>    | <b>1.27</b> | <b>1.58</b> |
| <b>North Okanagan</b>             | <b>1.30</b>    | <b>0.76</b> | <b>1.83</b> |
| <b>Upper Island/Central Coast</b> | <b>1.30</b>    | <b>0.75</b> | <b>1.86</b> |
| <b>Central Vancouver Island</b>   | <b>1.18</b>    | <b>0.68</b> | <b>1.69</b> |
| <b>Coast Garibaldi</b>            | <b>1.12</b>    | <b>0.87</b> | <b>1.37</b> |
| <b>South Okanagan Similkameen</b> | <b>1.05</b>    | <b>0.89</b> | <b>1.20</b> |
| <b>Fraser Valley</b>              | <b>1.05</b>    | <b>0.85</b> | <b>1.24</b> |
| <b>Vancouver</b>                  | <b>0.84</b>    | <b>0.73</b> | <b>0.95</b> |
| <b>Burnaby</b>                    | <b>0.84</b>    | <b>0.50</b> | <b>1.19</b> |
| <b>Simon Fraser</b>               | <b>0.76</b>    | <b>0.61</b> | <b>0.91</b> |
| <b>South Fraser Valley</b>        | <b>0.65</b>    | <b>0</b>    | <b>1.34</b> |
| <b>Capital</b>                    | <b>0.65</b>    | <b>0.42</b> | <b>0.88</b> |
| <b>Richmond</b>                   | <b>0.64</b>    | <b>0.52</b> | <b>0.75</b> |
| <b>North Shore</b>                | <b>0.59</b>    | <b>0.51</b> | <b>0.66</b> |

**Average Annual Age-Standardized Mortality Rates per 100,000 and 95% Confidence Intervals, 1995-1998, BC, Males, by Leading MVI Categories and Health Region**

| <i>Health Region</i>              | <b>Males</b>                   |                       | <b>MV - Pedestrian</b> |                      | <b>MV- w/o colls on highway</b> |                        |
|-----------------------------------|--------------------------------|-----------------------|------------------------|----------------------|---------------------------------|------------------------|
|                                   | <b>Another MV - Another MV</b> |                       |                        |                      |                                 |                        |
|                                   | Rate                           | Confidence Interval   | Rate                   | Confidence Interval  | Rate                            | Confidence Interval    |
| <b>East Kootenay</b>              | <b>5.79</b>                    | <b>(0 – 15.24)</b>    | <b>2.49</b>            | <b>(0-5.8)</b>       | <b>4.94</b>                     | <b>(0.45 – 9.44)</b>   |
| <b>West Kootenay - Boundary</b>   | <b>9.71</b>                    | <b>(9.58 – 9.84)</b>  | <b>2.43</b>            | <b>(0-5.5)</b>       | <b>7.31</b>                     | <b>(1.90 – 12.73)</b>  |
| <b>North Okanagan</b>             | <b>9.66</b>                    | <b>(2.79 – 16.54)</b> | <b>3.48</b>            | <b>(0– 7.29)</b>     | <b>11.05</b>                    | <b>(8.72 – 13.38 )</b> |
| <b>South Okanagan Similkameen</b> | <b>5.28</b>                    | <b>(3.74 – 6.81)</b>  | <b>1.61</b>            | <b>(0.19 – 3.02)</b> | <b>5.49</b>                     | <b>(3.50 – 7.49)</b>   |
| <b>Thompson</b>                   | <b>6.12</b>                    | <b>(0 – 13.0)</b>     | <b>4.57</b>            | <b>(0.55 – 8.58)</b> | <b>10.87</b>                    | <b>(5.59 – 16.15)</b>  |
| <b>Fraser Valley</b>              | <b>6.15</b>                    | <b>(1.36 – 10.95)</b> | <b>2.34</b>            | <b>(0 – 4.67)</b>    | <b>7.50</b>                     | <b>(2.72 – 12.29)</b>  |
| <b>South Fraser Valley</b>        | <b>3.65</b>                    | <b>(1.82 – 5.48)</b>  | <b>1.83</b>            | <b>(1.34 – 2.33)</b> | <b>2.03</b>                     | <b>(0.72 – 3.34)</b>   |
| <b>Simon Fraser</b>               | <b>2.14</b>                    | <b>(0.55 – 3.73)</b>  | <b>1.63</b>            | <b>(0.34 – 2.93)</b> | <b>1.65</b>                     | <b>(0.97 – 2.33)</b>   |
| <b>Coast Garibaldi</b>            | <b>6.81</b>                    | <b>(0 – 60.74)</b>    | <b>2.64</b>            | <b>(2.31 – 2.97)</b> | <b>7.99</b>                     | <b>(7.24 – 8.74)</b>   |
| <b>Central Vancouver Island</b>   | <b>5.78</b>                    | <b>(2.76 – 8.81)</b>  | <b>2.34</b>            | <b>(0 – 5.14)</b>    | <b>3.85</b>                     | <b>(2.34 – 5.36)</b>   |
| <b>Upper Island/Central Coast</b> | <b>3.87</b>                    | <b>(0 – 13.38)</b>    | <b>1.64</b>            | <b>(1.58 – 1.71)</b> | <b>5.35</b>                     | <b>(2.79 – 7.92)</b>   |
| <b>Cariboo</b>                    | <b>13.09</b>                   | <b>(0 – 29.20)</b>    | <b>2.58</b>            | <b>(2.44 – 2.73)</b> | <b>16.97</b>                    | <b>(2.56 – 31.38)</b>  |
| <b>North West</b>                 | <b>5.31</b>                    | <b>(0.85 – 9.76)</b>  | <b>5.23</b>            | <b>(0 – 18.57)</b>   | <b>11.66</b>                    | <b>(2.61 – 20.71)</b>  |
| <b>Peace Liard</b>                | <b>9.80</b>                    | <b>(0 – 20.73)</b>    | <b>4.53</b>            | <b>(0 – 24.99)</b>   | <b>10.48</b>                    | <b>(2.22 – 18.75)</b>  |
| <b>Northern Interior</b>          | <b>11.55</b>                   | <b>(8.32 – 14.78)</b> | <b>2.23</b>            | <b>(0.87 – 3.59)</b> | <b>11.47</b>                    | <b>(2.79 – 20.16)</b>  |
| <b>Vancouver</b>                  | <b>.82</b>                     | <b>(0 – 1.66)</b>     | <b>2.75</b>            | <b>(2.45 – 3.05)</b> | <b>.73</b>                      | <b>(0.26 – 1.20)</b>   |
| <b>Burnaby</b>                    | <b>2.16</b>                    | <b>(0 – 4.82)</b>     | <b>4.65</b>            | <b>(0 – 11.33)</b>   | <b>1.81</b>                     | <b>(0.21 – 3.42)</b>   |
| <b>North Shore</b>                | <b>2.32</b>                    | <b>(2.09 – 2.55)</b>  | <b>1.45</b>            | <b>(0.56 – 2.35)</b> | <b>3.51</b>                     | <b>(0 – 17.85)</b>     |
| <b>Richmond</b>                   | <b>2.02</b>                    | <b>(0 – 11.03)</b>    | <b>1.31</b>            | <b>(1.18 – 1.45)</b> | <b>1.29</b>                     | <b>(0-5.40)</b>        |
| <b>Capital</b>                    | <b>1.40</b>                    | <b>(0.92 – 1.89)</b>  | <b>.83</b>             | <b>(0 - 1.73)</b>    | <b>1.89</b>                     | <b>(0 – 7.32)</b>      |

**Average Annual Age-Standardized Mortality Rates per 100,000 and 95% Confidence Intervals, 1995-1998, BC, Females, by Leading MVI Categories and Health Region**

| <i>Health Region</i>                  | <b>Females<br/>Another MV - Another MV</b> |                       | <b>MV - Pedestrian</b> |                      | <b>MV- w/o colls on<br/>highway</b> |                       |
|---------------------------------------|--|-----------------------|------------------------|----------------------|-------------------------------------|-----------------------|
|                                       | Rate                                       | Confidence Interval   | Rate                   | Confidence Interval  | Rate                                | Confidence Interval   |
| <b>East Kootenay</b>                  | <b>3.80</b>                                | <b>(0 – 19.54)</b>    | <b>.00</b>             | <b>0</b>             | <b>4.46</b>                         | <b>(2.44 – 6.48)</b>  |
| <b>West Kootenay -<br/>Boundary</b>   | <b>6.13</b>                                | <b>(3.94 – 8.32)</b>  | <b>2.44</b>            | <b>(0-12.5)</b>      | <b>4.11</b>                         | <b>(0.55 – 7.68)</b>  |
| <b>North Okanagan</b>                 | <b>5.21</b>                                | <b>(1.21 – 9.22)</b>  | <b>2.64</b>            | <b>(0 – 13.41)</b>   | <b>4.05</b>                         | <b>(-0.93 – 9.04)</b> |
| <b>South Okanagan<br/>Similkameen</b> | <b>2.67</b>                                | <b>(0 – 5.82)</b>     | <b>1.48</b>            | <b>(0.20 – 2.75)</b> | <b>1.77</b>                         | <b>(0 – 5.60)</b>     |
| <b>Thompson</b>                       | <b>5.79</b>                                | <b>(1.13 – 10.46)</b> | <b>2.37</b>            | <b>(0 – 12.81)</b>   | <b>4.22</b>                         | <b>(1.86 – 6.58)</b>  |
| <b>Fraser Valley</b>                  | <b>3.25</b>                                | <b>(1.12 – 5.37)</b>  | <b>1.73</b>            | <b>(0.62 – 2.85)</b> | <b>1.53</b>                         | <b>(0.14 – 2.91)</b>  |
| <b>South Fraser Valley</b>            | <b>2.26</b>                                | <b>(0.41 – 4.11)</b>  | <b>1.18</b>            | <b>(0.11 – 2.25)</b> | <b>1.27</b>                         | <b>(0 – 7.99)</b>     |
| <b>Simon Fraser</b>                   | <b>.65</b>                                 | <b>(0.55 – 0.75)</b>  | <b>.99</b>             | <b>(0.37 – 1.60)</b> | <b>.63</b>                          | <b>(0-1.25)</b>       |
| <b>Coast Garibaldi</b>                | <b>2.61</b>                                | <b>(0.5-5.4)</b>      | <b>5.69</b>            | <b>(4.38 – 6.99)</b> | <b>4.13</b>                         | <b>(0 – 22.58)</b>    |
| <b>Central Vancouver<br/>Island</b>   | <b>2.97</b>                                | <b>(1.14 – 4.80)</b>  | <b>.87</b>             | <b>(0-1.3)</b>       | <b>1.99</b>                         | <b>(0 – 6.89)</b>     |
| <b>Upper Island/Central<br/>Coast</b> | <b>2.98</b>                                | <b>(0.36 – 5.59)</b>  | <b>1.72</b>            | <b>(0.52-2.8)</b>    | <b>3.41</b>                         | <b>(2.05 – 4.78)</b>  |
| <b>Cariboo</b>                        | <b>6.99</b>                                | <b>(0.99 – 12.98)</b> | <b>.00</b>             | <b>0</b>             | <b>5.60</b>                         | <b>(0 – 12.01)</b>    |
| <b>North West</b>                     | <b>4.57</b>                                | <b>(0 – 10.18)</b>    | <b>.00</b>             | <b>0</b>             | <b>4.69</b>                         | <b>(0 – 35.45)</b>    |
| <b>Peace Liard</b>                    | <b>13.04</b>                               | <b>(0 – 99.42)</b>    | <b>.00</b>             | <b>0</b>             | <b>3.98</b>                         | <b>(1.57 – 6.38)</b>  |
| <b>Northern Interior</b>              | <b>4.41</b>                                | <b>(0 – 8.92)</b>     | <b>2.66</b>            | <b>(0 – 7.27)</b>    | <b>3.15</b>                         | <b>(0 – 8.10)</b>     |
| <b>Vancouver</b>                      | <b>.54</b>                                 | <b>(0.21 – 0.88)</b>  | <b>1.72</b>            | <b>(0.54 – 2.89)</b> | <b>.71</b>                          | <b>(0 – 1.56)</b>     |
| <b>Burnaby</b>                        | <b>1.32</b>                                | <b>(0.50 – 2.13)</b>  | <b>1.05</b>            | <b>(0.95 – 1.15)</b> | <b>1.05</b>                         | <b>(0-3.54)</b>       |
| <b>North Shore</b>                    | <b>1.08</b>                                | <b>(1.02 – 1.14)</b>  | <b>3.35</b>            | <b>(1.5-5.6)</b>     | <b>2.23</b>                         | <b>(1.2-3.4)</b>      |
| <b>Richmond</b>                       | <b>.00</b>                                 | <b>0</b>              | <b>1.84</b>            | <b>(0 – 9.13)</b>    | <b>2.55</b>                         | <b>(1.52 – 3.57)</b>  |
| <b>Capital</b>                        | <b>1.17</b>                                | <b>(0 – 2.64)</b>     | <b>1.16</b>            | <b>(0 – 2.47)</b>    | <b>.77</b>                          | <b>(0 – 1.59)</b>     |

**Average Annual Age-Standardized Hospital Separation Rates per 100,000 and 95% Confidence Intervals, 1995-1998, BC, Males, by Leading MVI Categories and Health Region**

| <i>Health Region</i>              | <b>Males</b>                 |                         | <b>MV - Pedestrian</b> |                       | <b>MV- w/o colls on highway</b> |                       |
|-----------------------------------|------------------------------|-------------------------|------------------------|-----------------------|---------------------------------|-----------------------|
|                                   | <b>Another MV-Another MV</b> |                         |                        |                       |                                 |                       |
|                                   | Rate                         | Confidence Interval     | Rate                   | Confidence Interval   | Rate                            | Confidence Interval   |
| <b>East Kootenay</b>              | <b>67.88</b>                 | <b>(30.34 – 105.42)</b> | <b>16.78</b>           | <b>(5.26 – 28.30)</b> | <b>104.95</b>                   | <b>(34.54 –75.37)</b> |
| <b>West Kootenay - Boundary</b>   | <b>66.57</b>                 | <b>(39.75 – 93.38)</b>  | <b>17.09</b>           | <b>(11.63 –22.54)</b> | <b>112.33</b>                   | <b>(73.86 –50.79)</b> |
| <b>North Okanagan</b>             | <b>73.05</b>                 | <b>(37.14 – 108.96)</b> | <b>27.05</b>           | <b>(20.98 –33.12)</b> | <b>76.79</b>                    | <b>(44.96 –08.62)</b> |
| <b>South Okanagan Similkameen</b> | <b>61.59</b>                 | <b>(36.24 – 86.95)</b>  | <b>18.24</b>           | <b>(9.77 – 26.72)</b> | <b>47.15</b>                    | <b>(27.92 –66.38)</b> |
| <b>Thompson</b>                   | <b>57.04</b>                 | <b>(42.83 – 71.25)</b>  | <b>21.33</b>           | <b>(2.55 – 40.11)</b> | <b>93.83</b>                    | <b>(13.95 –73.71)</b> |
| <b>Fraser Valley</b>              | <b>44.66</b>                 | <b>(28.0 – 61.32)</b>   | <b>17.11</b>           | <b>(6.72 – 27.51)</b> | <b>64.45</b>                    | <b>(42.22 –86.68)</b> |
| <b>South Fraser Valley</b>        | <b>46.38</b>                 | <b>(34.0 – 58.77)</b>   | <b>19.80</b>           | <b>(8.66 – 30.95)</b> | <b>40.17</b>                    | <b>(18.41 – 1.94)</b> |
| <b>Simon Fraser</b>               | <b>37.81</b>                 | <b>(21.03 – 54.58)</b>  | <b>20.28</b>           | <b>(8.47 – 32.08)</b> | <b>34.56</b>                    | <b>(7.92 – 61.21)</b> |
| <b>Coast Garibaldi</b>            | <b>68.59</b>                 | <b>(43.94 – 93.24)</b>  | <b>32.67</b>           | <b>(12.45 –52.88)</b> | <b>48.79</b>                    | <b>(21.70 – 5.88)</b> |
| <b>Central Vancouver Island</b>   | <b>46.14</b>                 | <b>(30.44 – 61.84)</b>  | <b>19.16</b>           | <b>(13.31 –25.01)</b> | <b>56.21</b>                    | <b>(16.85 –95.57)</b> |
| <b>Upper Island/Central Coast</b> | <b>63.73</b>                 | <b>(37.16 – 90.30)</b>  | <b>25.86</b>           | <b>(13.74 –37.99)</b> | <b>91.99</b>                    | <b>(55.18 – 8.79)</b> |
| <b>Cariboo</b>                    | <b>108.63</b>                | <b>(95.45 – 121.81)</b> | <b>44.39</b>           | <b>(24.52 –64.26)</b> | <b>143.76</b>                   | <b>(71.32 –16.20)</b> |
| <b>North West</b>                 | <b>58.60</b>                 | <b>(25.76 – 91.43)</b>  | <b>21.78</b>           | <b>(3.79 – 39.77)</b> | <b>130.92</b>                   | <b>(85.17 –76.68)</b> |
| <b>Peace Liard</b>                | <b>61.44</b>                 | <b>(33.21 – 89.67)</b>  | <b>27.03</b>           | <b>(7.40 – 46.66)</b> | <b>118.05</b>                   | <b>(74.55 –61.54)</b> |
| <b>Northern Interior</b>          | <b>69.04</b>                 | <b>(40.23 – 97.86)</b>  | <b>21.27</b>           | <b>(12.89 –29.64)</b> | <b>114.84</b>                   | <b>(76.46 –53.23)</b> |
| <b>Vancouver</b>                  | <b>36.34</b>                 | <b>(2.22 – 70.46)</b>   | <b>16.89</b>           | <b>(0.66 – 33.12)</b> | <b>43.29</b>                    | <b>(4.37 – 82.22)</b> |
| <b>Burnaby</b>                    | <b>40.11</b>                 | <b>(16.47 – 63.75)</b>  | <b>20.01</b>           | <b>(10.88 –29.14)</b> | <b>33.24</b>                    | <b>(9.56 – 56.92)</b> |
| <b>North Shore</b>                | <b>26.33</b>                 | <b>(11.59 – 41.07)</b>  | <b>10.24</b>           | <b>(4.25 – 16.24)</b> | <b>27.09</b>                    | <b>(6.32 – 47.87)</b> |
| <b>Richmond</b>                   | <b>30.92</b>                 | <b>(15.47 – 46.38)</b>  | <b>17.39</b>           | <b>(9.75 – 25.04)</b> | <b>38.39</b>                    | <b>(6.54 – 70.25)</b> |
| <b>Capital</b>                    | <b>35.91</b>                 | <b>(22.08 – 49.73)</b>  | <b>15.10</b>           | <b>( 3.77- 26.42)</b> | <b>23.79</b>                    | <b>(0.94 – 46.64)</b> |

**Average Annual Age-Standardized Hospital Separation Rates per 100,000 and 95% Confidence Intervals, 1995-1998, BC, Females, by Leading MVI Categories and Health Region**

| <i>Health Region</i>              | <b>Females</b>                 |                         | <b>MV - Pedestrian</b> |                       | <b>MV- w/o colls on highway</b> |                       |
|-----------------------------------|--------------------------------|-------------------------|------------------------|-----------------------|---------------------------------|-----------------------|
|                                   | <b>Another MV - Another MV</b> |                         |                        |                       |                                 |                       |
|                                   | Rate                           | Confidence Interval     | Rate                   | Confidence Interval   | Rate                            | Confidence Interval   |
| <b>East Kootenay</b>              | <b>54.22</b>                   | <b>(19.25 – 89.19)</b>  | <b>17.90</b>           | <b>(12.64 – 3.17)</b> | <b>54.88</b>                    | <b>(28.83 – 0.93)</b> |
| <b>West Kootenay - Boundary</b>   | <b>43.03</b>                   | <b>(32.05 – 54.02)</b>  | <b>23.99</b>           | <b>(2.61 – 45.37)</b> | <b>63.96</b>                    | <b>(35.93 –91.99)</b> |
| <b>North Okanagan</b>             | <b>57.79</b>                   | <b>(50.05 – 65.53)</b>  | <b>24.64</b>           | <b>(10.93 –38.36)</b> | <b>39.55</b>                    | <b>(18.11 – 61.0)</b> |
| <b>South Okanagan Similkameen</b> | <b>49.60</b>                   | <b>(39.76 – 59.44)</b>  | <b>15.04</b>           | <b>(7.91 – 22.18)</b> | <b>21.48</b>                    | <b>(4.05 – 38.92)</b> |
| <b>Thompson</b>                   | <b>61.50</b>                   | <b>(49.44 – 73.57)</b>  | <b>18.62</b>           | <b>(4.61 – 32.64)</b> | <b>46.28</b>                    | <b>(1.45 – 91.11)</b> |
| <b>Fraser Valley</b>              | <b>36.84</b>                   | <b>(25.0 – 48.68)</b>   | <b>15.72</b>           | <b>(10.40 –21.03)</b> | <b>31.70</b>                    | <b>(12.17 –51.22)</b> |
| <b>South Fraser Valley</b>        | <b>35.27</b>                   | <b>(20.68 – 49.86)</b>  | <b>16.89</b>           | <b>(12.42 –21.37)</b> | <b>17.45</b>                    | <b>(4.29 – 30.61)</b> |
| <b>Simon Fraser</b>               | <b>29.21</b>                   | <b>(11.58 – 46.84)</b>  | <b>14.70</b>           | <b>(6.37 – 23.03)</b> | <b>17.21</b>                    | <b>(3.36 – 31.05)</b> |
| <b>Coast Garibaldi</b>            | <b>53.39</b>                   | <b>(21.85 – 81.92)</b>  | <b>26.81</b>           | <b>(16.87 –36.75)</b> | <b>24.47</b>                    | <b>(0 – 49.34)</b>    |
| <b>Central Vancouver Island</b>   | <b>38.58</b>                   | <b>(30.79 – 46.38)</b>  | <b>19.92</b>           | <b>(9.95 – 29.89)</b> | <b>29.65</b>                    | <b>(2.49 – 56.82)</b> |
| <b>Upper Island/Central Coast</b> | <b>41.50</b>                   | <b>(14.71 – 68.29)</b>  | <b>19.18</b>           | <b>(5.61 – 32.75)</b> | <b>49.14</b>                    | <b>(9.31 – 88.96)</b> |
| <b>Cariboo</b>                    | <b>91.01</b>                   | <b>(56.82 – 125.20)</b> | <b>33.26</b>           | <b>(28.18 –38.35)</b> | <b>83.67</b>                    | <b>(43.09 –24.25)</b> |
| <b>North West</b>                 | <b>40.25</b>                   | <b>(7.17 – 73.32)</b>   | <b>14.46</b>           | <b>(0 – 29.19)</b>    | <b>79.43</b>                    | <b>(44.40 –14.45)</b> |
| <b>Peace Liard</b>                | <b>59.34</b>                   | <b>(24.95 – 93.74)</b>  | <b>11.86</b>           | <b>(0 – 24.80)</b>    | <b>57.97</b>                    | <b>(17.28 –98.65)</b> |
| <b>Northern Interior</b>          | <b>51.73</b>                   | <b>(26.42 – 77.03)</b>  | <b>15.50</b>           | <b>(8.14 – 22.87)</b> | <b>64.57</b>                    | <b>(46.01 –83.14)</b> |
| <b>Vancouver</b>                  | <b>29.78</b>                   | <b>(1.45 – 58.11)</b>   | <b>13.63</b>           | <b>(0 – 27.52)</b>    | <b>21.50</b>                    | <b>(0.88 – 42.11)</b> |
| <b>Burnaby</b>                    | <b>27.85</b>                   | <b>(11.37 – 44.32)</b>  | <b>13.76</b>           | <b>(9.15 – 18.36)</b> | <b>18.00</b>                    | <b>(0 – 36.61)</b>    |
| <b>North Shore</b>                | <b>18.66</b>                   | <b>(6.05 – 31.26)</b>   | <b>11.48</b>           | <b>(3.45 – 19.50)</b> | <b>10.97</b>                    | <b>(3.42 – 18.52)</b> |
| <b>Richmond</b>                   | <b>17.98</b>                   | <b>(7.45 – 28.50)</b>   | <b>10.41</b>           | <b>(4.00 – 16.82)</b> | <b>15.83</b>                    | <b>(1.57 – 30.09)</b> |
| <b>Capital</b>                    | <b>28.88</b>                   | <b>(22.86 – 34.91)</b>  | <b>11.86</b>           | <b>(3.41 – 20.32)</b> | <b>13.11</b>                    | <b>(0.82 – 25.39)</b> |

**Average Annual Age-Standardized Hospital Separation Rates per 100,000 and 95% Confidence Intervals(CI), 1995-1998, BC, Males, by Leading MVI Categories and Health Region**

| <i>Health Region</i>       | Males  |                  | MV-Motorcyclist |                 | MV- Pedal Cyclist |                | MV- Pedestrian |                 |
|----------------------------|--------|------------------|-----------------|-----------------|-------------------|----------------|----------------|-----------------|
|                            | Rate   | CI               | Rate            | CI              | Rate              | CI             | Rate           | CI              |
| East Kootenay              | 180.79 | (90.32 –271.27)  | 31.62           | (28.04 – 35.21) | 7.44              | (0 –17.13)     | 17.37          | (10.22 – 24.51) |
| West Kootenay - Boundary   | 195.39 | (134.63 –256.15) | 40.35           | (22.16 – 58.55) | 2.44              | (0 –8.44)      | 11.59          | (4.99 – 18.20)  |
| North Okanagan             | 195.92 | (152.87 –200.97) | 30.05           | (15.84 – 44.26) | 6.08              | (0 –13.98 )    | 16.07          | (6.18 – 25.97)  |
| South Okanagan Similkameen | 120.15 | (86.01 – 154.29) | 21.77           | (9.02 – 34.52)  | 8.46              | (4.26 – 12.67) | 11.52          | (5.01 – 18.02)  |
| Thompson                   | 169.99 | (134.29 –205.70) | 23.70           | (5.67 – 41.73)  | 6.01              | (1.03 – 10.99) | 19.23          | (17.37 – 21.09) |
| Fraser Valley              | 114.08 | (84.69 –143.46)  | 17.72           | (9.33 – 26.11)  | 8.41              | (2.58 –14.24)  | 17.56          | (13.56 – 21.56) |
| South Fraser Valley        | 91.33  | (73.80 – 108.86) | 16.51           | (11.65 – 21.36) | 5.97              | (3.62 – 8.32)  | 15.92          | (11.88 – 19.97) |
| Simon Fraser               | 77.08  | (61.66 –92.49)   | 16.04           | (5.85 – 26.22)  | 5.90              | (3.28 – 8.52)  | 18.39          | (14.61 – 22.16) |
| Coast Garibaldi            | 141.74 | (78.21 – 205.28) | 32.24           | (13.19 – 51.30) | 7.87              | (2.01 – 13.74) | 23.92          | (7.30 – 40.55)  |
| Central Vancouver Island   | 112.87 | (87.15 –138.60)  | 27.13           | (18.36 – 35.90) | 5.33              | (4.46 – 6.20)  | 18.77          | (14.33 – 23.22) |
| Upper Island/Central Coast | 163.42 | (125.42 –201.42) | 29.51           | (14.36 – 44.65) | 11.15             | (2.51 – 19.79) | 21.76          | (10.92 – 32.61) |
| Cariboo                    | 282.86 | (235.15 –330.57) | 44.80           | (21.50 – 68.10) | 6.50              | (0 –15.27)     | 39.46          | (29.74 – 49.19) |
| North West                 | 186.37 | (132.39 –240.35) | 20.74           | (7.17 – 34.30)  | 4.27              | (0 –9.19)      | 23.34          | (12.19 – 34.50) |
| Peace Liard                | 195.96 | (113.91 –278.01) | 31.22           | (14.35 –48.10)  | .77               | (0 –3.21)      | 13.42          | (7.38 – 19.46)  |
| Northern Interior          | 201.42 | (129.07 –273.77) | 23.00           | (13.50 –32.51)  | 4.81              | (0.03 –9.60)   | 19.74          | (11.54 – 27.95) |
| Vancouver                  | 58.95  | (51.70 – 66.19)  | 13.26           | (8.83 – 17.69)  | 8.82              | (6.89 – 10.75) | 36.41          | (31.47 – 41.36) |
| Burnaby                    | 70.22  | (64.42 – 76.02)  | 13.22           | (9.63 – 16.80)  | 3.25              | (1.76 – 4.74)  | 23.27          | (18.09 – 28.15) |
| North Shore                | 50.30  | (30.65 – 69.94)  | 9.03            | (4.51 – 13.55)  | 5.88              | (0 –12.50)     | 10.18          | (3.60 – 16.77)  |
| Richmond                   | 61.05  | (52.52 – 69.58)  | 12.41           | (11.35 – 13.47) | 7.59              | (1.93 – 13.24) | 13.84          | (4.91 – 22.78)  |
| Capital                    | 61.37  | (41.54 – 81.20)  | 18.73           | (13.91 – 23.54) | 8.29              | (2.76 – 13.82) | 12.16          | (4.39 – 19.94)  |

**Average Annual Age-Standardized Hospital Separation Rates per 100,000 and 95% Confidence Intervals(CI), 1995-1998, BC, Females, by Leading MVI Categories and Health Region**

| <i>Health Region</i>       | Females |                   | MV-Motorcyclist |               | MV- Pedal Cyclist |               | MV- Pedestrian |                 |
|----------------------------|---------|-------------------|-----------------|---------------|-------------------|---------------|----------------|-----------------|
|                            | Rate    | CI                | Rate            | CI            | Rate              | CI            | Rate           | CI              |
| East Kootenay              | 120.34  | (60.54 – 180.15)  | 5.19            | (0 – 14.25)   | .64               | (0 – 2.68)    | 9.65           | (0 – 21.04)     |
| West Kootenay - Boundary   | 140.73  | (116.85 – 164.61) | 5.52            | (0 – 15.72)   | .97               | (0 – 3.66)    | 12.89          | (0 - 27.52)     |
| North Okanagan             | 113.03  | (55.92 – 170.14)  | 2.58            | (0 – 6.16)    | .00               | 0             | 12.05          | (4.32 – 19.78)  |
| South Okanagan Similkameen | 83.62   | (71.41 – 95.83)   | 5.53            | (1.11 – 9.96) | 2.17              | (0.46 – 3.89) | 11.81          | (2.21 – 21.42)  |
| Thompson                   | 133.32  | (65.46 – 201.17)  | 8.18            | (0 – 18.19)   | 1.14              | (0 – 2.34)    | 10.40          | (5.96 – 14.83)  |
| Fraser Valley              | 79.37   | (62.27 – 96.46)   | 3.67            | (3.09 – 4.24) | 1.70              | (0 – 4.35)    | 16.02          | (11.02 – 21.02) |
| South Fraser Valley        | 63.65   | (60.62 – 66.69)   | 2.01            | (0.97 – 3.05) | 1.66              | (0 – 3.90)    | 15.85          | (11.84 – 19.86) |
| Simon Fraser               | 57.63   | (43.60 – 71.67)   | 1.96            | (1.20 – 2.71) | .65               | (0 – 1.84)    | 14.47          | (9.51 – 19.43)  |
| Coast Garibaldi            | 86.66   | (57.87 – 115.45)  | 4.17            | (1.37 – 6.96) | .52               | (0 – 1.97)    | 15.97          | (0 – 35.64)     |
| Central Vancouver Island   | 82.30   | (42.61 – 121.99)  | 4.02            | (0.95 – 7.09) | 2.95              | (0 – 6.28)    | 10.79          | (6.08 – 15.51)  |
| Upper Island/Central Coast | 108.04  | (55.54 – 160.55)  | 4.19            | (0 – 9.24)    | 1.68              | (0 – 4.78)    | 10.68          | (0.88 – 20.47)  |
| Cariboo                    | 206.17  | (178.04 – 234.29) | 4.14            | (1.67 – 6.61) | 2.08              | (0 – 6.34)    | 16.67          | (11.14 – 22.20) |
| North West                 | 155.29  | (125.30 – 185.27) | 2.30            | (0 – 6.52)    | 2.94              | (0 – 8.56)    | 19.70          | (8.25 – 31.14)  |
| Peace Liard                | 106.27  | (91.59 – 120.95)  | 6.49            | (0 – 15.08)   | .00               | 0             | 8.76           | (0 – 19.87)     |
| Northern Interior          | 130.09  | (108.29 – 151.88) | 3.54            | (0.46 – 6.63) | 3.20              | (0.17 – 6.24) | 16.37          | (1.64 – 31.11)  |
| Vancouver                  | 47.51   | (39.43 – 55.59)   | 2.10            | (0.38 – 3.81) | 2.16              | (0.77 – 3.56) | 29.97          | (27.71 – 32.23) |
| Burnaby                    | 50.24   | (40.81 – 59.68)   | 1.32            | (0 – 3.83)    | 1.85              | (0 – 4.70)    | 16.66          | (7.26 – 26.06)  |
| North Shore                | 39.68   | (28.71 – 50.65)   | 1.36            | (0 – 3.51)    | .55               | (0 – 1.56)    | 15.82          | (4.36 – 27.27)  |
| Richmond                   | 49.28   | (40.48 – 58.08)   | 1.86            | (0 – 4.36)    | .40               | (0 – 2.13)    | 11.55          | (5.95 – 17.15)  |
| Capital                    | 42.30   | (19.96 – 64.65)   | 4.21            | (0.82 – 7.59) | 2.17              | (0.62 – 3.73) | 13.20          | (12.01 – 14.39) |