BC Coroners Service 2010 Annual Report

Ministry of Justice

Posted: January 4, 2013

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

Vision

Safe and Healthy Communities

Mission

The Coroners Service is committed to conducting a thorough, independent examination of the factors contributing to death in order to improve community safety and quality of life in British Columbia.

Values

Integrity, Respect, Accountability, Healthy and Dynamic Work Environment, Quality Service

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MESSAGE FROM THE CHIEF CORONER

On behalf of the British Columbia Coroners Service, I am pleased to present our 2010 Annual Report. This report represents the Service's commitment to public and government accountability by providing information regarding all aspects of our operation, along with statistical data about the deaths we investigate. Data supplied by coroners' investigations informs public health and safety initiatives, and is an important indicator of the effectiveness of safety measures.

The report is a reflection of the dedication and hard work of Coroners in communities across the province, whose efforts assist families and communities on a daily basis. Working in difficult circumstances and challenging environments, the men and women of the Coroners Service ensure that no death in the province is concealed, overlooked or ignored and that recommendations are made, when indicated, to prevent similar deaths in the future. I am proud to present this report on their behalf.

I invite you to view the report on our website at www.pssg.gov.bc.ca/coroners and to provide us with your suggestions and comments to assist us in further improving our information and our service to the public.

Lisa Lapointe

Chief Coroner

ABOUT US

History

The role of the Coroner has evolved over the eight centuries since the office was formally established in 1194, from being a form of tax collector to an independent judicial officer charged with the investigation of sudden, unexpected or unnatural death. The duties of the early coroners were varied, and included the investigation of almost any aspect of medieval life that had the potential to provide revenue for the Crown. A prime source of income was unnatural and unexplained death, as such deaths were subject to a number of taxes and fines against the community in which they occurred. This role was officially designated as "keeping the pleas of the Crown", which is the source of the modern-day title: the word "coroner" is derived from the original Latin descriptor *custos placitorum coronas.*

By the nineteenth century the coroner's fiscal responsibility had diminished, and coroners were more concerned with determining the circumstances and causes of unexpected and unnatural deaths, for the benefit of the community as a whole. It is in this latter capacity that coroners have been serving British Columbia for over 125 years.

B.C. inherited the *English Coroners Act (of 1848)* when it became a province in 1871. At that time, coroners conducted their work independently through their own municipalities, as there was no provincial organization. In 1932, the City of Vancouver built the first "Coroner's Court" building. The building contained a court room, where coroner's inquests were held, a morgue, and autopsy facilities. The building was also shared with the City Analyst's Laboratory, which performed toxicological analysis for the Coroners Department of Vancouver.

Coroners continued to work independently until the appointment of a provincial Supervisory Coroner, Glen McDonald, who served in this capacity from 1969 to 1979. The first B.C. *Coroners Act* was enacted into law in 1979. At this time, the Vancouver Coroners Department came under the authority of the province, and was declared a provincial service. The first Chief Coroner, Dr. William McArthur, was appointed in 1979; five other Chief Coroners have served B.C. through to 2010 (Figure 1).

Figure 1. The Chief Coroners of British Columbia.
From left, top row: Glen McDonald (1969-1979), Dr. William McArthur (1979-1981), Robert Galbraith (1981-1988); middle row: Vincent Cain (1988-1996), Larry Campbell (1996-2001), Terry Smith (2001-2009); bottom row: Dr. Diane Rothon (2010)

Our Organization

Mandate

The B.C. Coroners Service (BCCS) is a fact-finding – not fault-finding – agency, which provides an independent service to families, communities, government agencies and other organizations. Pursuant to the Coroners Act (2007), all unnatural, sudden and unexpected deaths in the province, the deaths of all children, and the deaths of all those in designated institutions, such as police lock-ups and provincial and federal prisons, must be reported to, and investigated by, a coroner. The legislation gives coroners wide powers of investigation, including the authority to enter and inspect premises, inspect and seize records, authorize post mortem examinations, require individuals to provide information on oath or affirmation, and compel witnesses to attend and give evidence at an inquest.

Following an investigation, coroners are required to report their findings in writing to the chief coroner setting out the identity of the deceased and how, when, where and by what means the deceased died. The coroner may also make recommendations related to the death or recommend that an inquest be held.

The BCCS supports public safety by:

- Determining the facts of all sudden and unexpected deaths in BC, all children's deaths and all deaths in designated institutions.
- Providing an additional layer of analysis by also reviewing all children's deaths to discover and monitor trends.
- Ensuring that no death is concealed, overlooked or ignored.
- Producing either a Coroner's Report or a Verdict at Coroner's Inquest that reports on the findings of the coroner's investigation or the public inquest.
- Making recommendations, where appropriate, to both public and private agencies so that a similar death is less likely to occur in the future.
- Conducting inquests when mandated by the *Coroners Act* or when there is a strong public interest in the circumstances of the death or potential for prevention of death in similar circumstances in the future.
- Establishing Death Review Panels to allow for aggregate review of deaths with similar circumstances to identify opportunities for intervention to prevent future deaths.
- Collecting information regarding the circumstances of death and conducting statistical analysis to identify risks to public safety and trends over time.

- Supporting research by public and private agencies, academic institutions and other jurisdictions by sharing information about factors related to death in British Columbia.
- Preparing and disseminating Public Safety Advisories when warranted to warn the public about risks to public safety.
- Providing statistical information and analysis to agencies, ministries of government, and other decision-makers to inform policies and legislation in support of public safety.
- Supporting criminal investigations by authorizing post mortem examinations to confirm identification and when necessary, to establish cause and manner of death.
- Maintaining sophisticated missing persons/found human remains database and applying innovative geospatial, DNA, dental and/or other comparative analyses to support the identification of found human remains for critical legal/criminal/estate purposes.
- Ensuring necessary planning, training and resources are in place to respond to mass fatality incidents to accomplish appropriate recovery and achieve time-sensitive determinations regarding identification and cause and manner of death.
- Collaborating with other provinces and jurisdictions to exchange information, support research and develop recommendations.

Governance

In 2010, the BCCS was an agency within the Ministry of Public Safety and Solicitor General (PSSG), which was mandated to maintain and enhance public safety across the province. The Chief Coroner is appointed under the *Coroners Act* by the Lieutenant-Governor in Council, upon the recommendation of the Solicitor General. The position is judicially independent with respect to statutory functions.

Structure

The Chief Coroner, whose office was located in Burnaby in 2010, is the head of the BCCS. There are also regional offices, one in each of five BCCS regions within the province: Fraser, Interior, Island, Northern, and Vancouver Metro. Our regions approximate the BC Health Authority Regions (Fraser, Interior, Northern, Vancouver Island and Vancouver Coastal); however there are slight differences in the regional delineations.

The regional offices were located in Victoria, Vancouver, Surrey, Kelowna and Prince George. Each region is managed by a Regional Coroner. The chief coroner supervises and directs all regional coroners in the province. Regular operations are run out of the regional offices, while administration, research and planning are conducted out of the Office of the Chief Coroner.

Fraser Region: Burnaby to the Coquihalla Highway summit, east to Manning Park and north to Jackass Mountain bordering Merritt.

Interior Region: Includes the region north to 100 Mile House and Blue River, east to the Alberta border, south to the USA border and west to the Manning Park gate, including Ashcroft, Lytton and Lillooet.

Island Region: Includes all of Vancouver Island, the Gulf Islands and Powell River.

Northern Region: Includes the region north, east and west from 100 Mile House to all Provincial borders, and the Queen Charlotte Islands/Haida Gwaii.

Vancouver Metro Region: Includes Sunshine Coast, Sea to Sky Corridor, North Shore, Vancouver, UBC, Richmond, and Delta.

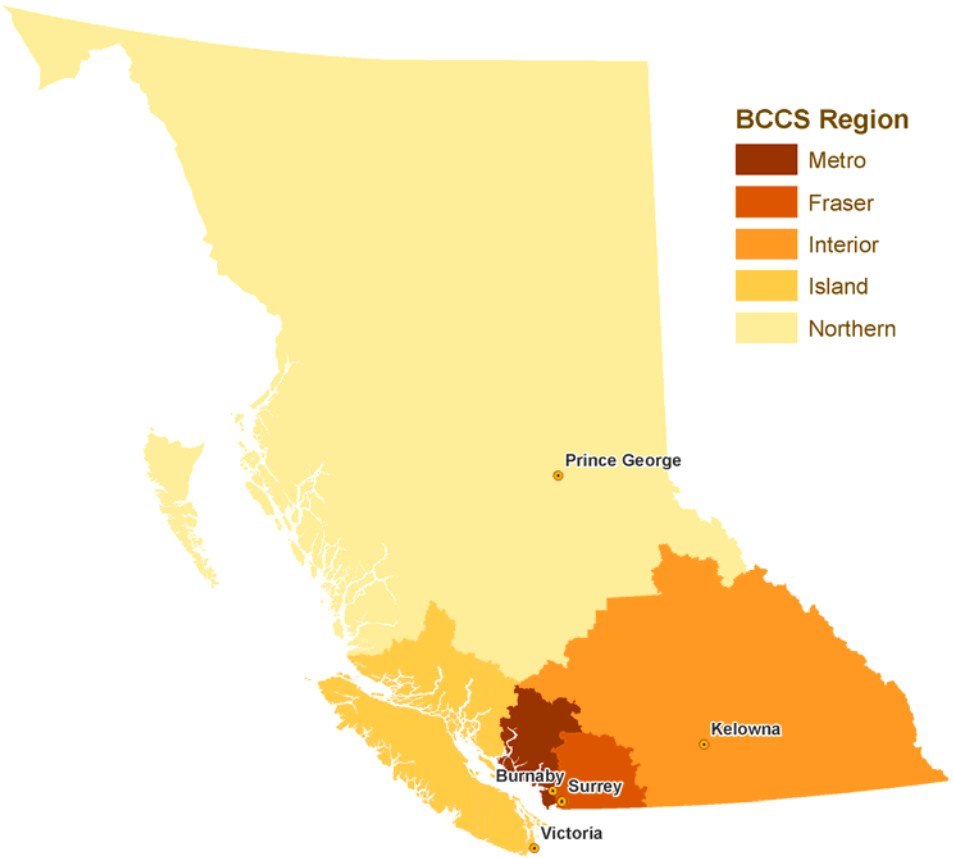


Figure 2. The BCCS provincial regions.

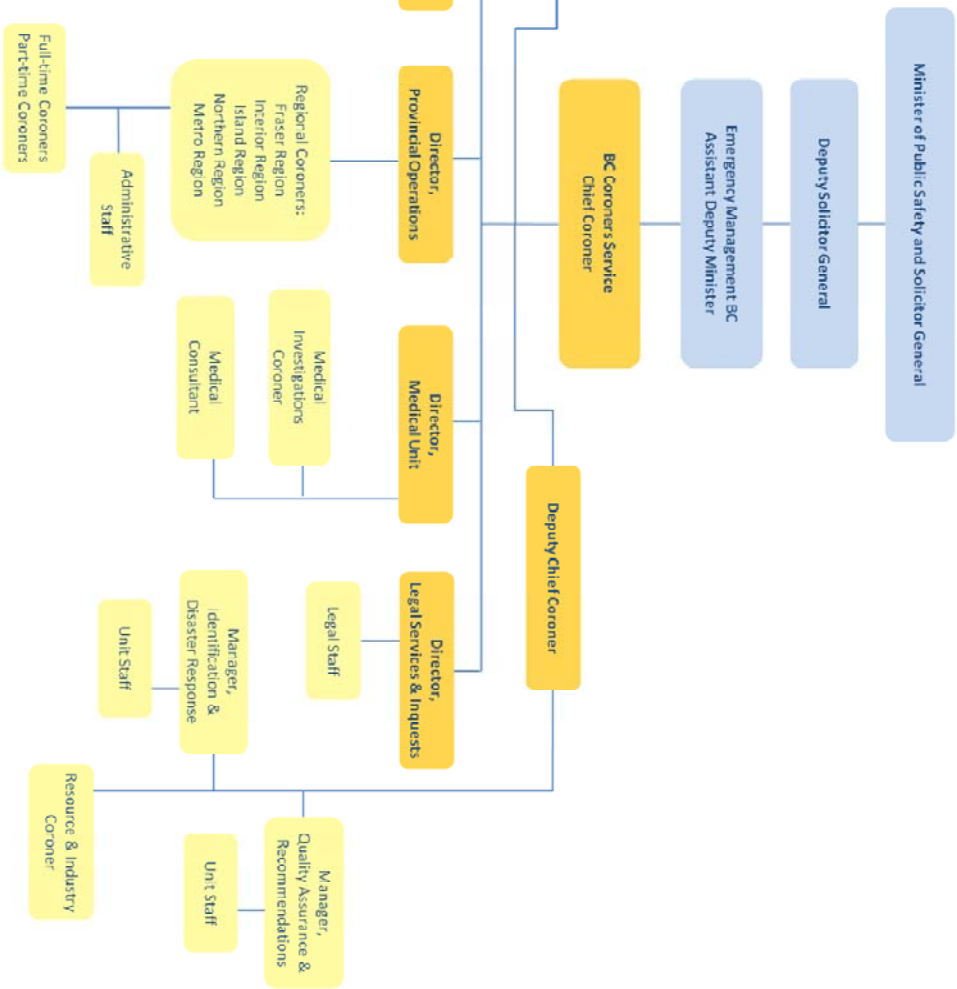


Figure 3.The structural organization of the BCCS in 2010.

Budget

The BCCS operating cost for 2010/2011 was $13.2 million (April 1, 2010 to March 31, 2011). This was spent in three areas: salaries and benefits, direct costs and support costs. Beginning in fiscal year 2010/11, there was a centralization of certain support service costs in the amount of $1.4 million to Shared Services BC. This change is reflected in the total operating cost, and the proportion of the total that was allocated to support service costs, both of which are significantly different to previous years.

Salaries and benefits accounted for half of the total expenditure. In 2010, the BCCS employed 76 part-time coroners, 29 full-time coroners, and 35 other staff members (the number of staff was variable over the year).

Direct costs made up most of the remaining expenditures. In 2010, fees for autopsies, toxicological analysis and body handling (e.g., recovery, storage and transport costs) accounted for 42.0% of the total expenditure (93.1% of direct costs). Other direct costs include expenses such as inquests (e.g., juries, court reporters and related inquest fees), other forensic services, and travel.

Support costs include expenses such as external contracts, systems, and communications.

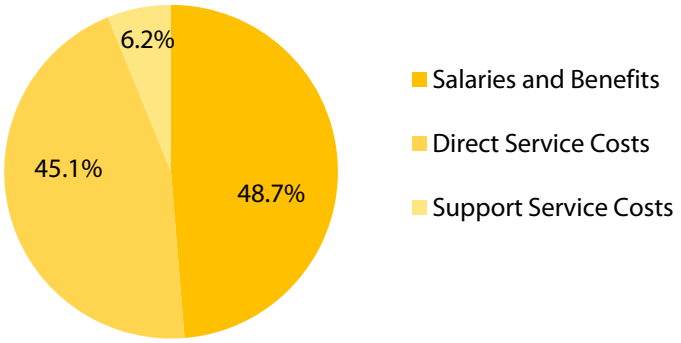


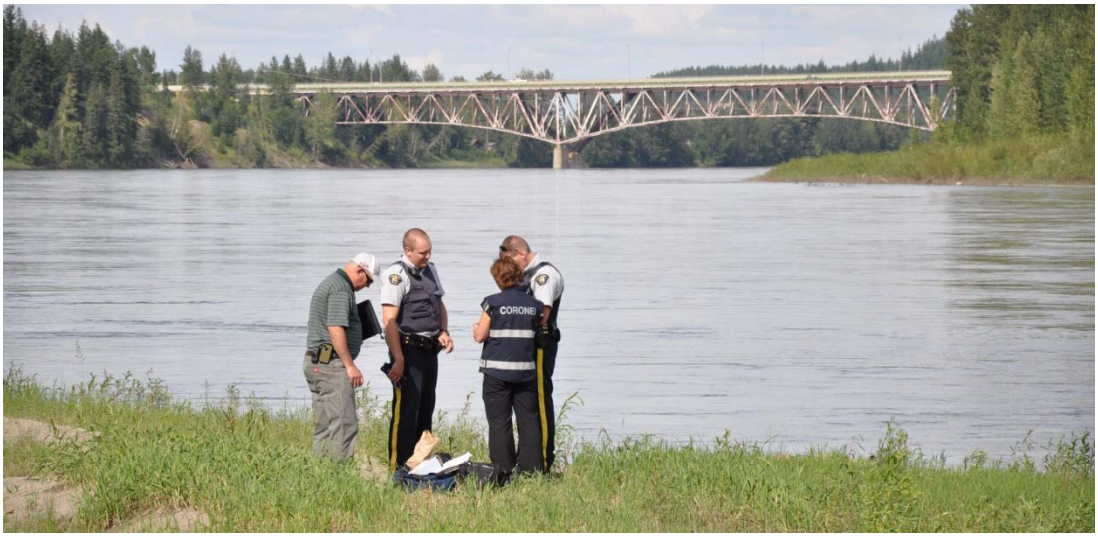
Figure 4. Total expenditure for the 2010/2011 fiscal year.

OUR PERFORMANCE

Achievements

In 2010 BC Coroners Service:

- Investigated **7825 deaths** across BC.
- Held **11 inquests**.
- Distributed **234 recommendations** proposed by inquest juries and coroners to the Chief Coroner following the investigation of 44 deaths.
- Conducted a **Death Review Panel** on domestic violence, to examine aggregate death circumstances and identify opportunities for intervention to prevent similar deaths in the future.
- Issued a **Public Safety Bulletin** on the topic of water-related activities, to further injury and death prevention efforts.



Performance Targets & Results

The BCCS is committed to conducting independent, thorough, and timely investigations and inquests. Timeliness is a measure of our effectiveness as an agency. These performance indicators guide our organization in planning and decision making and, through the annual reporting process, enable us to remain open and accountable to the people of B.C.

When setting annual targets, we consider several factors including our historical performance, desired service levels, operational requirements, and resources available for achieving short- and long-term goals. In setting annual targets, the BCCS strives for continuous improvement.

Coroners' Investigations

The 2010 target for completion of investigations was 4.5 months (135 days). This target was based on the historical average time to case completion. While a majority of cases are expected to be completed within this timeframe, reasons for delay may include factors such as pending criminal charges, the need for other agencies to complete their investigations prior to the BCCS completing its report, and the complexity of the investigation.

Days to case completion is calculated as the number of days between the date a coroner is notified of a death and the date the case is concluded at the regional level (before being sent to the Chief Coroners Office to be filed). Deaths reported to the BCCS which are subsequently determined to be non-reportable under our legislation (e.g. natural, expected deaths) are not included in this measure.

Table 1. Performance measure: Timeliness of coroners' investigations.

Performance Measure	2010 Target	2010 Actual	2011 Forecast	2012 Target
Median days to case completion	135 days (4.5 months)	134 days	135 days	130 days

Coroners' Inquests

In 2010, the expectation for commencement of inquests was set at one year from the date the death was reported to the BCCS. However, inquest timeliness is greatly affected by factors external to the BCCS, such as the length of criminal and other participating agencies' investigations (e.g., WorkSafeBC, Transport Canada), and the complexity of many of the types of cases that go to inquest (e.g. child maltreatment, police-involved deaths, etc.). Going forward, the target for inquest timeliness will be adjusted to reflect both the desired service level, and the external factors that influence inquest timeliness.

Days to inquest is calculated as the number of days between the date a coroner is notified of a death and the date the inquest commences.

Table 2. Performance measure: Timeliness of coroners' inquests.

Performance Measure	2010 Target	2010 Actual	2011 Forecast	2012 Target
Median days to inquest	365 days (1 year)	751 days (2.1 years)	615 days (1.7 years)	620 days (1.7 years)

OUR SERVICES

Coroners' Investigations

Our agency investigates sudden and unexpected deaths of adults, and all deaths of children, to establish the circumstances of death and determine if anything can be done to prevent future deaths. Coroners are quasi-judicial investigators, independent from law enforcement agencies and health authorities.

Across Canada, death investigation is carried out by either Coroner or Medical Examiner systems. In addition to B.C., Ontario, Saskatchewan, Quebec, New Brunswick, Prince Edward Island, Nunavut, the Northwest Territories and Yukon also operate under a Coroner system. Medical Examiner systems operate in Alberta, Manitoba, Nova Scotia and Newfoundland. Coroners are not necessarily medical specialists, though many have some medical training. Coroners in B.C. come from varied backgrounds including medical, investigative, legal, and the social sciences.

Coroners do not assign fault or blame, but rather conduct a fact-finding investigation into deaths that are unnatural, unexpected, unexplained or unattended. This investigation entails a careful examination of the circumstances surrounding a death, to determine identity and understand how, when, where and by what means an individual died. Pathologists, toxicologists and specialized investigators may be consulted to provide assistance in an investigation. Identification of trends and risk factors to help prevent future deaths forms a critical part of the overall mandate of the BCCS.

When a death is reported to the BCCS, the investigating coroner is authorized to collect information, conduct interviews, inspect and seize documents such as medical records, and secure the scene. The facts surrounding the death, as determined by the Coroner, are released in a written Coroner's report, which may also include recommendations to prevent future deaths.

Although natural and expected deaths are non-reportable under the *Coroners Act*, these deaths are occasionally reported to the BCCS. This might occur, for example, when the decedent's treating physician is temporarily away or when a patient dies in an ambulance or within a very short time of admission to hospital. Sometimes the police are also called to a death scene which automatically triggers a report to the Coroner. Following a brief investigation, the investigating coroner may summarily conclude the case without a Coroner's report, if he or she is satisfied that the death was natural.

Pathology Services (Autopsy)

An autopsy is a complete internal and external examination of a body after death. An autopsy is ordered when the cause of death cannot otherwise be determined, or if mandated by policy, such as for deaths in police custody. For cases in which autopsy is not mandatory, if a reasonable and probable cause of death can be deduced on the basis of the deceased's medical history, the circumstances surrounding the death and a careful examination of the body, an autopsy may not be necessary. The BCCS retains the services of pathologists who conduct autopsies on a fee-for-service basis.

An autopsy can be complex or non-complex. Non-complex autopsies are performed in cases where the death appears to be due to natural causes, or a result of a non-criminal or accidental injury. A complex autopsy may be required in cases of homicide or death under suspicious circumstances.

In 2010, the fees for these services were $1850 for a complex autopsy and $1000 for a non-complex autopsy, and the BCCS ordered autopsies for 1,994 cases or 25.5% of all deaths reported.

Table 3. Number and percentage of autopsies performed in 2010 by classification of death.

	Accidental	Homicide	Natural	Suicide	Undetermined	Total
Total Deaths	1,594	115	5,419	530	167	7,825
# w/ Autopsy	710	85	948	106	145	1,994
% w/ Autopsy	44.5	73.9	17.5	20.0	86.8	25.5

Toxicology

Toxicology is the study of the nature and effects of chemicals on living organisms, particularly people, and their detection within the body. The pathologist may collect specimens for toxicological analysis if the cause of death is not obvious at autopsy, if poisoning or drug or alcohol use is suspected, or if mandated by policy, such as for operators of motor vehicles. Toxicological testing may also be conducted in cases where no autopsy is required, but use of alcohol or drugs is suspected to have contributed to the death.

Toxicology testing is most often provided on a fee-for-service basis at the Provincial Toxicology Centre, an accredited laboratory. For deaths in which there is also a criminal investigation in progress, the RCMP Forensic Laboratory conducts toxicology testing. The BCCS may also make use of toxicological tests performed at regional hospitals.

In 2010, this service was provided on a contract basis at a total cost of $752,000. The BCCS ordered toxicological tests for 1,700 cases, or 21.7% of all deaths reported.

Table 4. Number and percentage of toxicological tests performed in 2010 by classification of death.

	Accidental	Homicide	Natural	Suicide	Undetermined	Total
Total Deaths	1,594	115	5,419	530	167	7,825
# w/ Toxicology	812	30	561	152	145	1,700
% w/ Toxicology	50.9	26.1	10.4	28.7	86.8	21.7

Units and Specialized Coroners

Due to the complexity of many death investigations, the BCCS has specialized investigation units. In 2010, these included the Medical Unit, Child Death Review Unit, Identification and Disaster Response Unit, and the Resource Industry Coroner. The Research Unit and Legal Services and Inquests Unit are additional, non-investigative units that support the operation of the BCCS.

Medical Investigation Unit

The Medical Investigation Unit provides coroners with guidance and assistance in investigating medical issues and in obtaining relevant medical information. The unit serves as a liaison with the medical community and health authorities. It functions to provide consistency in the management of investigation of deaths with complex medical issues. The Unit also works to identify common factors contributing to death, which may require subject-specific review to inform prevention strategies. In addition, the Unit represents the BCCS on the Perinatal Mortality Review Committee and the BC Patient Safety Quality Council.

In 2010, the Medical Investigation Unit partnered with the Research Unit to examine the burden of mortality due to prescription opiate medication. Abuse of prescription opiates is a public health crisis in North America, and our mortality data has proven valuable to a variety of stakeholders.

Identification and Disaster Response Unit

The Identification and Disaster Response Unit (IDRU) provides support and expertise in identification, disaster response, and business continuity planning. The IDRU also actively investigates all historical unidentified human remains cases, dating as far back as the 1960's. When unidentified remains are found and reported to the coroner, or missing persons cases are queried by law enforcement, the IDRU is able to compare data from several sources, including conventional personal descriptor and case information databases, in conjunction with its Geographic Information System and a DNA database, and the Provincial Dental Databank. In addition, IDRU participates in the development of provincial and national missing persons and unidentified remains policies, procedures and programs.

IDRU support for front-line coroners was broadened to include deployment to complex death scenes where technical extrication efforts are required to ensure a complete recovery of all human material. In 2010, the IDRU was deployed most frequently to incidents involving plane crashes and structural and vehicle fires, which can result in significant fragmentation or commingling of remains. The IDRU also supports frontline responders with Chemical, Biological, Radiological, Nuclear, and Explosive (CBRNE) fatality incidents.

The IDRU Disaster Response Coordinator (DRC) was responsible for fatality management planning for the Vancouver 2010 Winter Olympic Games. The DRC was a member of Integrated Public Safety and acted as a liaison with the Integrated Security Unit for the Games.

In 2010 the IDRU received reports of 102 unidentified human remains cases, of which: 25 were identified; 73 were determined to be either Archaeological or non-human; and 4 remained outstanding at the time of writing. The unit also processed approximately 80 formal missing persons queries, adding the case details to its database for comparison with future unidentified human remains cases.

Child Death Review Unit

The Child Death Review Unit (CDRU) is legislated under the *Coroners Act* to review, on an individual or aggregate basis, the facts and circumstances related to the deaths of all persons under the age of 19, including both sudden and unexpected deaths and those of natural causes. The objective of the CDRU is to better understand how and why children die, and to translate those findings into action to prevent future deaths and to improve the health, safety and well-being of all children in BC.

Child death cases are sent to the CDRU for review when the coroner's investigation or inquest into the death is complete. In 2010, each case was assigned to a reviewer within the unit who conducted an initial examination of the Coroner's file and gathered additional information required to ensure a full understanding of the case, which may include medical, school and law

enforcement records, or conducting interviews with family members of the child. Cases were then examined by the CDRU team, who collectively offer a multi-disciplinary perspective on the events leading up to the child's death and risk factors involved.

Once case reviews are complete, data is analysed to identify risk factors related to the different circumstances of child death. Examination of aggregate case findings allows the CDRU to identify trends or emergent issues that require targeted action. Based on these findings, the CDRU develops recommendations aimed at preventing similar deaths in the future. The CDRU supports and monitors the implementation of recommendations on an on-going basis, allowing it to track advancements in policy, programs and practice related to child health and safety in B.C. Information on the unit's activities and review findings is shared with the public and stakeholders on a regular basis.

In 2010, the Unit released the 2009 Annual Report, providing a summary of the work completed in that year. The report can be viewed online at: http://www.pssg.gov.bc.ca/coroners/child-death-review/docs/cdru-2009annualreport.pdf.

Resource Industry Coroner

The Resource Industry Coroner is focused on the investigation of death in the forestry sector. In addition to examining the circumstances related to a specific death, the Resource Industry Coroner also considers forestry fatalities within the historical and provincial context. This role includes administration of inquests and death review panels undertaken to fully examine the circumstances in forestry related deaths, in order to develop recommendations to reduce the likelihood of further such deaths in the future.

This position also serves as a resource to coroners across the province, providing assistance in particularly complex circumstances, and serving as a liaison between the Coroners Service and industry stakeholders such as the British Columbia Forest Safety Council. Additionally, the Resource Industry Coroner may also review non-workplace deaths involving tree falling and similar activities undertaken by homeowners on private land, and select recreational activities on public land.

Legal Services and Inquests Unit

The Legal Services and Inquests Unit operates under the direction of the Executive Director of Legal Services (Chief Counsel), assisted by the Legal Assistant/Inquest Co-ordinator. The main responsibility of this unit is to oversee the holding of inquests. In addition, the unit provides direction, training and assistance to Presiding Coroners. There were six trained and experienced Presiding Coroners in 2010.

The unit is responsible for the provision of legal advice on day-to-day issues related to the interpretation of the Coroners Act and the legal mandate of the BCCS. The unit researches and prepares legal opinions, policies and procedures regarding issues that may arise within the British Columbia Coroners Service. The unit also researches and assesses legal trends and emerging issues in provincial, federal and international jurisdictions and provides legal advice on their potential impact on the BCCS. Additionally, in co-operation with the provincial Legal Services Branch, the unit provides legal advice, representation and guidance to the Chief Coroner on a broad range of corporate and operational issues including proposed legislative amendments, policy developments and administrative procedures.

The Coroners Act can be viewed online at www.qp.gov.bc.ca/statreg/stat/C/07015_01.htm.

Research Unit

The Research Unit is responsible for monitoring death data, conducting statistical analyses and compiling annual and special reports. The Unit works to support the BCCS' prevention mandate by analyzing aggregate data to identify risks to public safety and trends over time. Where appropriate, public safety advisories are issued to prevent similar injuries and deaths from occurring. The Research Unit responds to requests for information from the public, media, and academic researchers, and also works to support improvements to public safety by providing statistical information and analysis to other government agencies and ministries.

In 2010, the unit provided statistics in response to more than 133 data requests. The unit also prepared a statistical review of all known domestic violence related fatalities in BC over a five-year period, to provide background information for the death review panel held in March 2010. This report and others prepared by research staff on topics of public interest, such as accidental water related fatalities, illicit drug deaths, motor vehicle deaths and suicide, are available on our website at www.pssg.gov.bc.ca/coroners/publications/index.htm#statistics.

Inquests

The Inquest Process

Inquests are formal court proceedings, with a five-person jury, held to publicly review the circumstances of a death. The jury hears evidence from witnesses in order to determine the facts of the death. The presiding coroner is responsible to ensure the jury maintains the goal of fact finding, not fault finding. Upon conclusion, a written report, the Verdict at Inquest is prepared. It includes the classification of the death and whenever possible recommendations of the jury on how to prevent a similar death.

There are several reasons to hold an inquest, which are outlined in the *Coroners Act*. An inquest is required for all deaths in police custody, although there may be exceptions. In all other deaths, the decision to hold an inquest is at the discretion of the Chief Coroner. An inquest may be held if there appears to be significant public interest in the circumstances of the death, or in cases in which recommendations could be made to prevent similar deaths. In 2010, the Chief Coroner had a standing committee, consisting of the Chief Medical Advisor, the Deputy Chief Coroner and the Chief Counsel, to review deaths and to provide advice regarding the selection of cases for inquest.

Once it is determined that an inquest will be held, the date for the inquest is selected and the next of kin, counsel, other investigating agencies (e.g., WorkSafeBC, police) and interested persons are advised that an inquest is planned. The *Coroners Act* authorizes the Presiding Coroner to issue a subpoena to any person who, in the opinion of the Presiding Coroner, may have direct knowledge that could help the jury arrive at a verdict. A person who receives a subpoena does not have the right to decline to attend or decline to testify, and must participate as a witness in the Inquest.

The *Coroners Act* also allows those whose interests may affected by evidence likely to be adduced at an inquest to participate in the proceedings. Participants may appear personally or by counsel, tender evidence and call witnesses, and examine, cross examine, and re-examine witnesses. Anyone wishing to participate in an inquest should apply to the Presiding Coroner in writing.

The sheriff summons the jury. If the inquest is being held into the death of a worker for whom Part I of the *Workers Compensation Act* applies, reasonable effort must be made to ensure all or part of the jury is composed of persons familiar with the type of work for which the deceased was employed. In addition to jurors, sheriffs, court reporters, witnesses, family of the deceased and members of the general public are also present at the inquest.

At the opening of the inquest, the Presiding Coroner explains the purpose of the inquest to the jury and the jury's responsibilities under the *Coroners Act*. The Coroners Counsel gives a short summary of facts relating to the death. Witnesses are then called and examined by Coroners Counsel, participants and/or their counsel, the Presiding Coroner and members of the jury. Once all witnesses have been called and any final instructions given by the presiding coroner, the jury is sequestered to deliberate and consider their verdict.

The jury's findings and any recommendations are included in a public document, the *Verdict at Coroner's Inquest (Verdict)*, which also includes a classification of death, the Presiding Coroner's comments, a brief overview of the circumstances of the death and the evidence presented that supports the jury's recommendations. The full *Verdict* is available upon request once the inquest is closed, and is also posted on the Coroners Service website.

The Presiding Coroner submits the jury's recommendations to the Chief Coroner for dissemination to appropriate people, agencies and government ministries. The *Coroners Act* provides no legal authority for the BCCS to compel an agency or individual to implement a recommendation. We do request that all those to whom recommendations are directed provide a written response, either explaining what steps are being taken to implement the recommendations, or why the recipient does not find it feasible to adopt them. These responses are also available to the public, and are posted on our website.

A schedule for upcoming inquests is available online at:
www.pssg.gov.bc.ca/coroners/schedule/index.htm.

2010 Coroner's Inquests

There were 11 inquests held into 11 deaths in 2010. A complete copy of the jury's Verdict for each inquest is available online at: www.pssg.gov.bc.ca/coroners/schedule/2010/index.htm.

Statistics on inquest deaths reflect the year of inquest and not the year of death. There were 94 recommendations issued by juries following inquests held in 2010; however, many were forwarded to multiple agencies, resulting in a total of 135 recommendations distributed.

Table 5. Type of death and total inquest deaths in 2010.

Type of Death	Deaths
Police Custody	7
Forestry-related	1
In-Custody Homicide	1
Motor Vehicle	1
Police Shooting	1
Total Number of Deaths	11
Total Number of Inquests	11
Total Number of Recommendations Issued	94

Table 6. Number of inquests and deaths at inquest by inquest year, 2002-2010[1].

	2002	2003	2004	2005	2006	2007	2008	2009	2010
# Inquests	11	11	13	15	23	26	17	11	11
# Deaths	11	13	19	15	24	29	17	17	11

Table 7. Number of deaths at inquest and classification of death by inquest year, 2002-2010.

Classification	2002	2003	2004	2005	2006	2007	2008	2009	2010
Accidental	5	6	11	7	11	19	12	8	8
Homicide	-	-	6	3	7	6	5	4	2
Suicide	1	5	-	2	6	-	-	4	-
Natural	5	-	1	3	-	1	-	-	1
Undetermined	-	-	1	-	-	3	-	1	-
Total	11	11	19	15	24	29	17	17	11

[1] In 2004, 2006, 2007 and 2009, inquests were held for multiple fatalities.

Table 8. Means of death for inquest deaths by inquest year, 2002-2010.

Means of Death	2002	2003	2004	2005	2006	2007	2008	2009	2010
Poisoning: Alcohol and/or Drug	3	3	-	3	3	8	6	3	3
Firearms	-	4	6	5	4	3	4	-	1
Restraint/Excited Delirium[2]	2	2	4	1	7	3	1	2	1
Fall	2	-	2	2	1	2	2	1	1
Hanging	-	3	-	-	3	-	1	2	-
Motor Vehicle Incident	-	-	-	1	2	1	1	3	1
Beating/Abuse	-	-	1	-	2	2	1	-	1
Drowning	1	-	5	-	-	1	-	-	-
Natural disease	2	-	1	3	-	-	-	-	1
Stabbing	-	-	-	-	1	-	-	5	-
Suffocation	-	-	-	-	-	5	-	-	-
Other	1	1	-	-	1	2	1	-	2
Undetermined	-	-	-	-	-	2	-	1	-
Total	11	13	19	15	24	29	17	17	11

Data are subject to change, and are not directly comparable to published counts from previous years.

[2] There is currently no widely accepted medical definition or known medical cause of excited delirium-associated sudden death.

Death Review Panels

The Death Review Panel Process

The purpose of a Death Review Panel is to review the facts and circumstances of deaths, in order to provide advice to the Chief Coroner with respect to matters that may impact public health and safety and the prevention of deaths. Typically, a Death Review Panel is established following a series of deaths with similar circumstances, and for which there may be an opportunity for intervention to prevent further such deaths.

Once the Chief Coroner has decided to establish a panel, a chairperson and members are appointed. A panel typically consists of experts and advocates drawn from a variety of disciplines, which could include health, education, policing, judicial services, public health, social services, and professional bodies.

The panel meets for two or three days to discuss the circumstances and preventability of the deaths, and to confirm trends, patterns and themes. A primary goal of the review panel process is to identify gaps, failures or shortcomings in services and systems, and other opportunities for intervention that may prevent similar deaths in the future. Following the review, the panel may make recommendations. Like an inquest jury, members of the death review panel must not make any finding of legal responsibility or express any conclusion of law.

Following the review by the panel, the chair will report to the Chief Coroner any findings and recommendations. Recommendations are then distributed by the Chief Coroner. Death review panel reports, including recommendations, are public documents and are posted on the BCCS website.

2010 Death Review Panels

There was one Death Review Panel held in 2010. The reports produced by the panels are public documents and can be viewed on our website.

On March 9, 10 and 11, 2010, a Death Review Panel was convened at the Office of the Chief Coroner in Burnaby to examine the circumstances surrounding 11 incidents of domestic violence. Together these 11 incidents resulted in 29 deaths – 21 homicides, including 3 children, and 8 suicides.

These 11 incidents were selected from an exhaustive review of over 100 coroner case files dating back to 1995. All of the incidents considered for selection had already been the subject of completed coroner investigations as well as criminal investigations, in cases where the perpetrator survived the incident. The 11 incidents selected were representative of the most compelling and significant domestic violence risk factors and systemic gaps in service.

Panel members included representatives of the investigative, prosecutorial, correctional and social service agencies encountered by victims and perpetrators of domestic violence. Subject matter experts included representatives from the Royal Canadian Mounted Police (RCMP), Victoria City and Vancouver Police Departments, Crown Counsel, Community Corrections, the Representative for Children and Youth, the Ministry of Children and Family Development, the Ending Violence Association of BC, Simon Fraser University Department of Psychology, RCMP Victim Services and the Victim Services and Crime Prevention Division of the Ministry of Public Safety and Solicitor General.

The report detailing the findings and recommendations of the panel is available at: www.pssg.gov.bc.ca/coroners/publications/docs/death-review-panel-domestic-violence.pdf.

PREVENTION

Recommendations

In addition to investigating to determine the circumstances of death, coroners and juries may make recommendations to prevent future deaths in similar circumstances. Recommendations focus on improving systems and standards, and may be issued to both public and private agencies. Prior to September 2008, a jury or coroner could make one of two types of recommendations:

Action: a change is recommended to the agency and a response to this recommendation is requested by the BCCS. Recommendations may be directed to one or more agencies/ individuals.

Information: no changes are recommended, but the findings of the investigation are brought to the agency or individual's attention for informational purposes only. A response to the information is not requested.

As of September 2008, the BCCS only issues recommendations for action. A response to action recommendations is requested within 90 days of distributing the recommendation.

The Chief Coroner is responsible for bringing the findings and recommendations from coroners' investigations and inquest juries to the attention of appropriate individuals, agencies, the public and ministries of government. Although the BCCS has no statutory authority to order change or otherwise ensure that recommendations are carried out, it is expected that recommendations will be given serious consideration by the agencies to which they are directed.

The BCCS has been widely successful in having recommendations considered and implemented in the past, as indicated by the recommendation response rates summarized in the tables below. As a direct result of coroner and jury recommendations, policies and procedures have been changed with the goal of preventing death and making our communities safer.

Recommendation Statistics

The BC Coroners Service distributed recommendations on 44 deaths in 2010. There were a total of 234 distributions; one recommendation may be distributed to multiple recipients. Each distribution is counted in the following statistics, thus if a recommendation is issued to three separate agencies, it is counted as three recommendations.

Of the 44 deaths resulting in recommendations, 28 were investigated by coroners and 16 were inquest cases. The majority of these were accidental deaths. Of the 234 recommendations distributed in 2010, 58 were made by Coroners and 176 were made by inquest juries.

Table 9. Number of recommendations distributed by type and year[3] of distribution, 2005-2010.

Year	Deaths	Rec. Type	#	Total
2005	73	Action	228	274
		Information	46	
2006	68	Action	149	187
		Information	38	
2007	129	Action	615	684
		Information	69	
2008	89	Action	451	506
		Information[4]	55	
2009	50	Action	321	321
2010	44	Action	234	234

[3] The greater number of recommendations distributed in 2007 and 2008 are due in part to an increased number of inquests and/or the number of recommendations per inquest.

[4] As of September 2008, the BCCS no longer issues recommendations for information purposes.

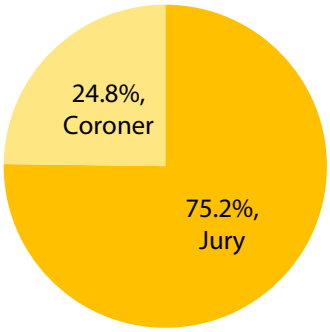


Figure 5. Percentage of recommendations distributed in 2010 by source.

Table 10. Recommendations distributed in 2010 by source and classification of death.

Classification	Coroner	Jury	Total
Accidental	50	98	148
Homicide	-	29	29
Natural	4	30	34
Suicide	1	19	20
Undetermined	3	-	3
Total	58	176	234

Table 11. Agencies receiving ten or more recommendations in 2010.

Agency	#
RCMP "E" Division	32
BC Ambulance Service	21
Ministry of Public Safety and Solicitor General	15
WorkSafe BC	14
Transport Canada	11
Ministry of the Attorney General	10

Table 12. Recommendations distributed in 2010 by topic and source.

Topic	Coroner	Jury	Total
Police/Corrections	8	76	84
Medical	17	32	49
Industry	3	21	24
Domestic Violence	-	22	22
Transportation	6	13	19
Alcohol/Drug Treatment	-	10	10
Commercial Fishing	10	-	10
Recreation	9	-	9
Rail Transport	3	-	3
Air Transport	2	-	2
Liquor Control	-	2	2
Total	58	176	234

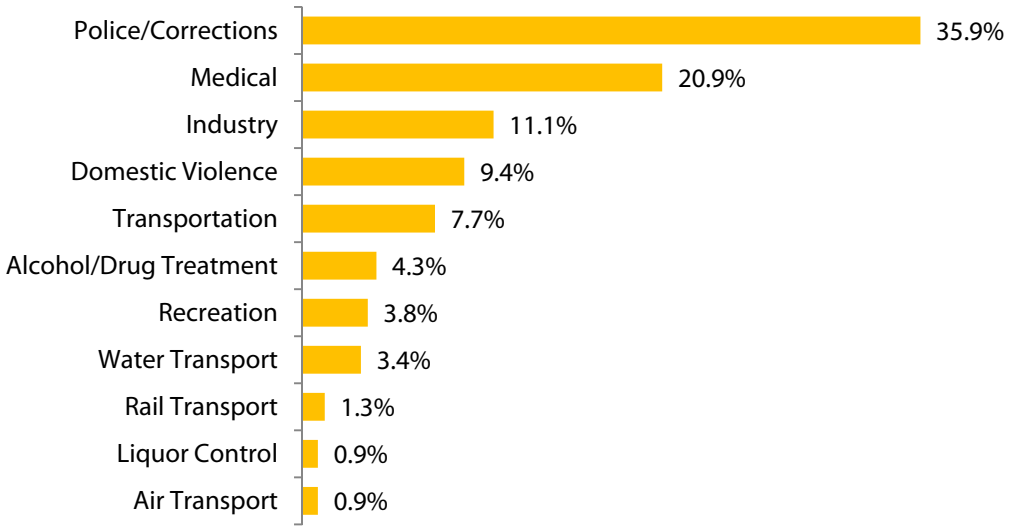


Figure 6. Topic of recommendations distributed in 2010.

Recommendation Outcomes

As of June 2012, the Coroners Service had a 91.5% response rate to recommendations distributed in 2010. Overall, 20.5% of recommendations were fully implemented, 1.3% was partially implemented, and another 24.8% were under review.

Nearly half were not implemented, for a variety of reasons:

- 25.2% indicated that the recommendation was already in practise. This can occur when a recipient has taken action during the course of the coroner's investigation or immediately thereafter.
- 10.6% indicated that the recommended action was ineffective, impractical or not feasible.
- 7.7% indicated that the recommendation was misdirected.
- 1.3% were unable to implement the recommendation due to legislative restrictions.

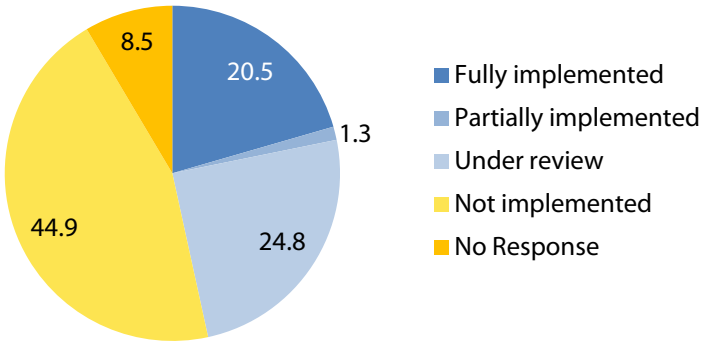


Figure 7. Outcome of recommendations distributed in 2010 (%).

Table 13. Outcome of recommendations distributed in 2010.

Outcome	Total	%
Fully implemented	48	20.5
Partially implemented	3	1.3
Under review	58	24.8
Not implemented	105	44.9
No Response	20	8.5
Total	234	100.0

Different response patterns were seen for coroner recommendations as compared with jury recommendations distributed in 2010. Coroner recommendations were twice as likely as jury recommendations to receive no response; however, coroner recommendations were also twice as likely to be fully implemented. Approximately half of jury recommendations were not implemented compared to one third of coroner recommendations.

The justification given for recommendations not implemented, however, did not differ substantially between coroner and jury recommendations.

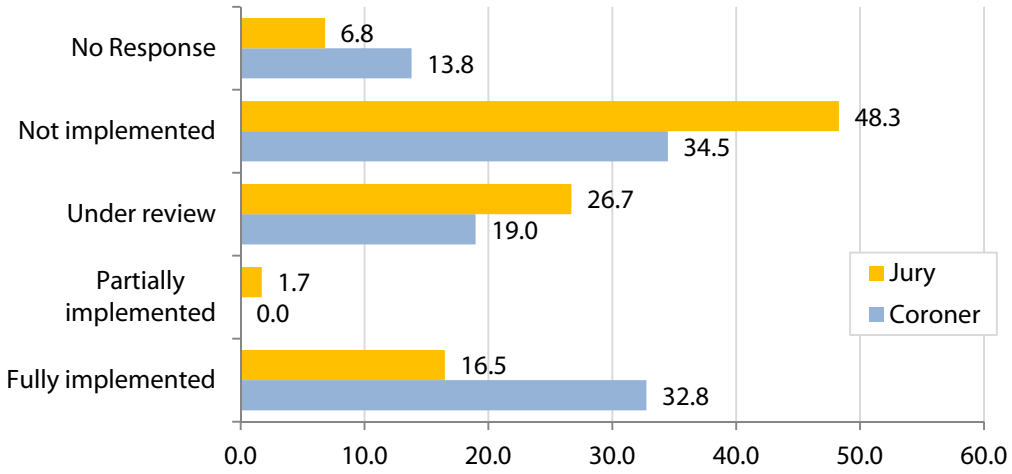


Figure 8. Outcome of recommendations distributed in 2010 by source (%).

When assessing outcomes based on the topic of recommendation, simpler, lower-cost recommendations, such as reviewing information, performing an audit or increasing awareness, were more likely to be implemented than complex, higher-cost recommendations, such as providing a new service or program, increasing staffing, or increasing or creating funding.

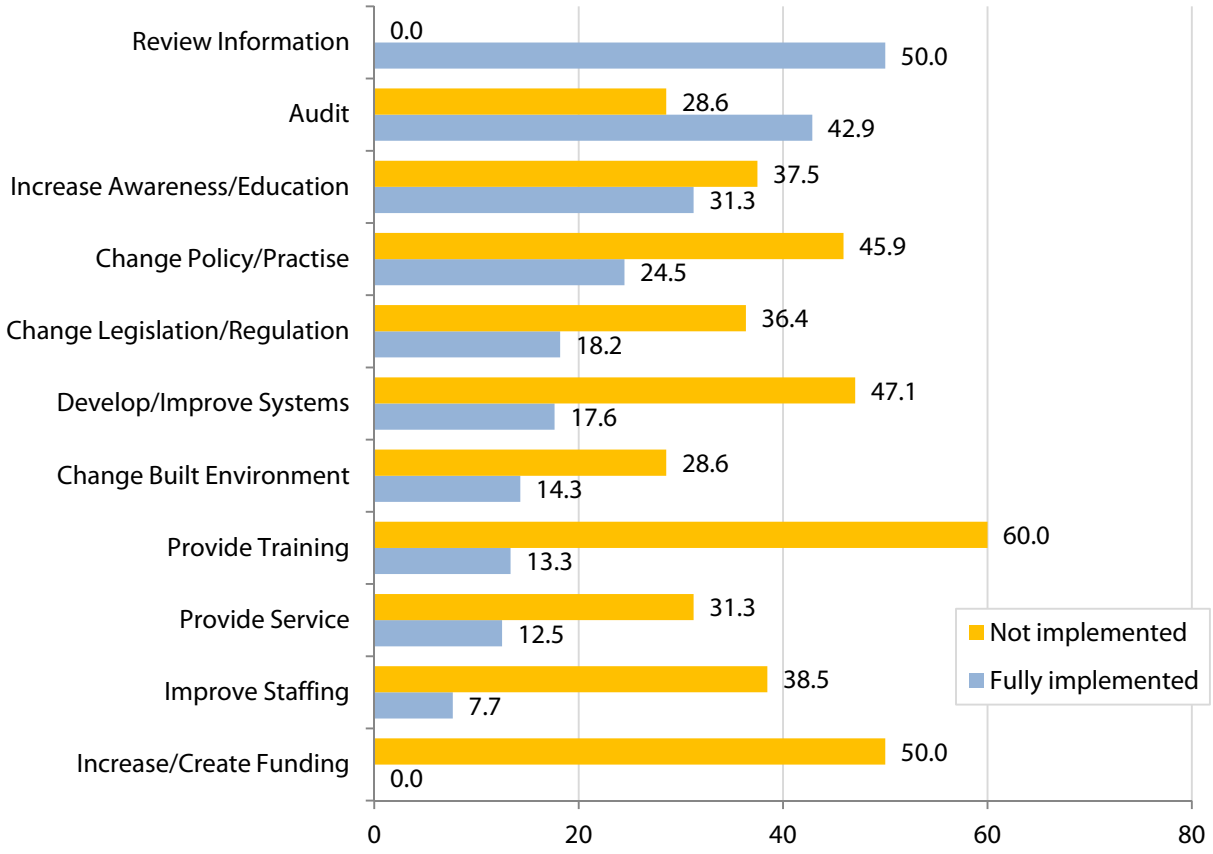


Figure 9. Outcome of recommendations distributed in 2010 by recommended action (%).

Private corporations, sport governing bodies, provincial corrections, and the Federal government were the most likely to implement recommendations. The railways, policing (RCMP and provincial), health, and municipal governments were the least likely to implement recommendations. Note that the sector breakdown includes some sectors with very few recommendations, and thus should be interpreted with caution.

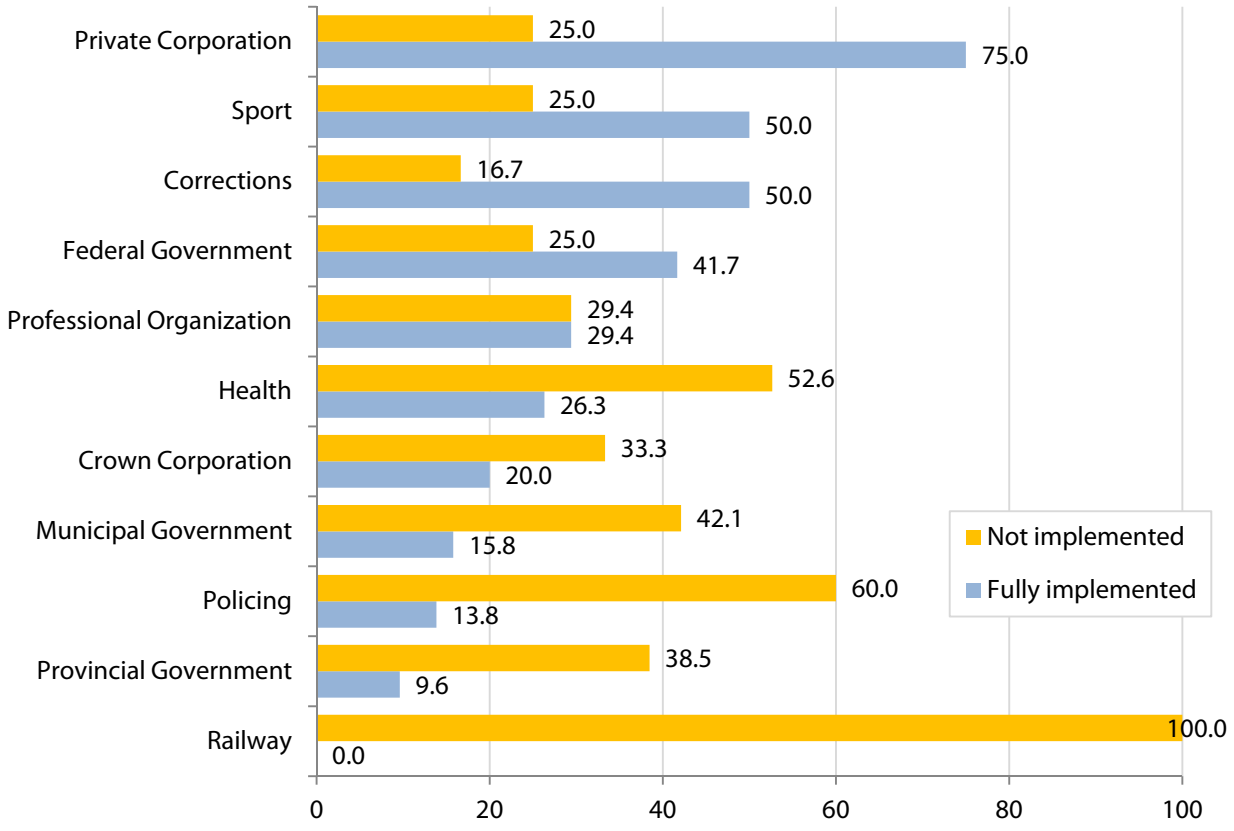


Figure 10. Outcome of recommendations distributed in 2010 by sector (%).

Coroner's Recommendation Cases

The following case summaries represent all investigations by coroners where public safety concerns were identified and recommendations were made to prevent future injuries and deaths occurring in similar circumstances. While the deaths occurred between 2004 and 2010, in each of these cases the recommendations were issued in 2010.

Police

Clarifying Roles of Search & Rescue Personnel

Case #1: In February 2009, a woman and her spouse became lost while skiing out-of-bounds near a resort in the interior of B.C. Although signs of skiers in distress were seen by three other backcountry users over a period of several days, only minimal, informal communication occurred between the resort, the local volunteer Search and Rescue (SAR) organization, and the RCMP. Due to a series of incorrect assumptions and miscommunications, no search was initiated until the spouse was spotted by a helicopter 10 days after the couple had entered the backcountry. The woman had died during the evening of their eight day in the wilderness. The death was classified as Accidental.

One recommendation was forwarded to the RCMP: 1) to produce and distribute training materials clarifying the respective roles and responsibilities of the RCMP and SAR organizations as related to reports of persons in need of assistance in the backcountry.

Missing Persons Policies

Case #2: In April 2010, a woman was reported missing by the bed and breakfast where she was staying. She failed to return from a planned trip to Grouse Mountain the previous day, and was supposed to have boarded a flight at Vancouver Airport on the day of the report. Vancouver Police (VPD) confirmed that the woman did not board her flight, and that her credit card was used at a restaurant on Grouse Mountain the previous day. North Vancouver RCMP took over the investigation, and reviewed surveillance footage of the Grouse Mountain tram. An individual matching the woman's description was seen to board the tram in the footage, but officers believed that the she subsequently left Grouse Mountain. The following day, the woman's body was found at the base of a chair lift tower by skiers, where she had died of hypothermia. It is

likely that deteriorating weather conditions, including high wind and snow, contributed to her inability to find her way off the mountain. Although all evidence suggested that the woman was deceased by the time she was reported missing, the incident raised the question of reducing the likelihood of future deaths occurring in similar situations. The death was classified as Accidental.

One recommendation was forwarded to the VPD: 1) to review its missing persons investigation policy with all appropriate personnel in order to ensure that such investigations are conducted in accordance with its policy.

Use of Police Restraints

Case #3: In January 2009, emergency personnel attended a private residence to treat an adult male who was alternating between moments of unresponsiveness and combative delirium. Prior to his collapse, the male had smoked marijuana and taken MDMA (ecstasy), and drank approximately 8 litres of water. While en route to hospital, the ambulance pulled over and requested police assistance as the male was combative. The male was handcuffed and the police followed the ambulance to the hospital. On arrival at hospital, the male stopped breathing and the handcuffs were immediately removed; however he did not regain consciousness and died the following day. The treating physician and the pathologist both indicated the male's chance of recovery following the initial collapse in his residence was minimal, and that restraint did not contribute to his death. The death was classified as Accidental.

Two recommendations were forwarded to the BC Ambulance Service and RCMP "E" Division: 1) to review and clarify policies regarding the use of handcuffs on patients transported by BCAS, and under what circumstances a police officer should be present in the ambulance; and 2) to ensure that all paramedics receive training on the restraint devices supplied in ambulances.

Corrections

Use of Drugs in Cell

Case #4: In March 2008, an adult male inmate in Provincial custody was found deceased in his bed by staff performing morning cell checks. Illicit drug paraphernalia were found in the cell, and it was subsequently determined that he had died of an illicit drug overdose. Investigation determined that staff did not conduct visual cell inspections in accordance with Standard Operating Procedures in the hours prior to discovery of the inmate's death. The death was classified as Accidental.

Two recommendations were forwarded to Fraser Regional Correctional Centre: 1) to revise the criteria for assessing health during visual cell inspections to include observation of breathing; and 2) to consider re-training or testing staff to ensure they are aware of the Standard Operating Procedures regarding visual cell inspections.

Case #5: In January 2009, an adult male inmate in Provincial custody was found in medical distress in his cell. The inmate was attended by the staff nurse, and was transported to hospital where, despite resuscitative efforts, he died the same day. Upon investigation, it was found that in addition to his prescribed methadone, the inmate had taken an illicit drug and two other prescription medications not prescribed to him. The death was classified as Accidental.

Two recommendations were forwarded to the Provincial Director of Adult Custody and the Medical Director of the BC Corrections Branch: 1) that addiction treatment services should be delivered by the Health Care Team, to improve utilization and allow the mental and physical aspects of treatment to be delivered by the same team; and 2) to maintain a database on commonly used medications and current trends for abuse in the prison setting, allowing health care providers to exercise harm reduction by considering medications that can be administered with low risk.

Medical

Improving Safety in Community Care Facilities

Case #6: In January 2009, a female resident of a community care facility was found in cardiac arrest, with an apparent airway obstruction. The woman had a well-documented compromised swallowing ability. She was taken to hospital for treatment, but died four days later. The facility where the woman resided had placed a lock on the kitchen door; however, another resident had opened the door, and the woman entered the kitchen and began to eat food that had been left on the counter. General practise in the facility was that all food was to be removed from the kitchen once everyone had eaten. It was reported by staff that requests had been made to have a spring-loaded mechanism installed on the kitchen door, so that it would close automatically, but this had not been done. The death was classified as Accidental.

Two recommendations were forwarded to the facility: 1) to complete a risk assessment of all new clients prior to admission, and, where feasible, make modifications to the home to ensure client safety; and 2) that the reasons for not completing modifications should be documented by staff and reviewed on an annual basis.

Medication Prescribing Practices

Case #7: In January 2009, an adult male was found unresponsive at his residence, after having had two seizures in the late night/early morning. The man had a seizure disorder, and had difficulty managing his medications and medical appointments. Family members contacted his physician when they became aware that he was running out of his medication, but were unable to make arrangements for a prescription refill. They also contacted the local pharmacy to see if there were any refills left on the prescription, and were told that there were not, and they were unable to obtain an emergency refill as the man was not a regular patient of the pharmacy. A family member then made arrangements for the man to see a local doctor; however, he passed away on the day of the appointment. The death was classified as Natural.

Two recommendations were forwarded to the College of Pharmacists of British Columbia: 1) to include the findings of this case in the newsletter that is provided to all Pharmacists across BC, to remind staff about the need to use professional judgment with vulnerable patients when providing emergency prescription refills; and 2) to consider amending policy related to emergency prescription refills, with specific criteria to guide a Pharmacist in deciding when to provide an emergency refill.

Case #8: In November 2009, an adult female was found unresponsive in her bed by a family member. The woman was prescribed chloral hydrate as a sleep aid. In the months prior to her death, it was found that, on occasion, she had refilled her prescription at shorter intervals than prescribed, indicating that she may have been over-medicating. Toxicological testing indicated a fatal level of chloral hydrate. The woman had no history of depression, suicidal ideation, or previous suicide attempts, and left no note to indicate such. The death was classified as Accidental.

One recommendation was forwarded to the College of Physicians and Surgeons of British Columbia: 1) to issue a warning to B.C. physicians regarding the risks of prescribing chloral hydrate in the outpatient setting.

Hospital Narcotics Control Practises

Case #9: In July 2009, a female hospital worker was found deceased at her residence, after not reporting for her scheduled shift. Prescription medications not issued to the woman, and medical paraphernalia belonging to the hospital were found in the home. The cause of death was

determined to be an overdose of a prescription drug that had not been prescribed to her. The death was classified as Accidental.

One recommendation was forwarded to the Interior Health Authority: 1) to undertake an audit of current narcotics management, ensuring that policy aligns with best practices in safe narcotic controls.

Methadone Maintenance Program

Case #10: In April 2010, emergency personnel were unable to resuscitate a woman who was found unresponsive in her bed. The woman was on the methadone maintenance program and under the treatment of a psychiatrist for addiction issues. The woman's family physician was treating her for anxiety, and was unaware of her methadone prescription. The woman had not recently expressed suicidal ideation, but had previously attempted suicide two times via overdose. Toxicological examination indicated levels of methadone and another medication that were each well in excess of the maximum therapeutic level. The death was classified as Suicide.

One recommendation was forwarded to the Methadone Maintenance Committee of the College of Physicians and Surgeons: 1) to review this case with respect to the apparent lack of communication between the methadone maintenance physician and the family physician who was prescribing the other medications.

Safe Sleep Practices: Bed Sharing with Infants

Case #11: In March 2009, a male infant was found unresponsive while sleeping in the adult bed he shared with his mother. He was transported to hospital with resuscitation efforts underway, but paramedics and hospital staff were unable to revive him. After the birth, the infant's mother had been contacted by a Public Health Nurse (PHN) by phone and in person. Required visits to the doctor for weighing and immunizations were completed, and the infant was doing well. Investigation revealed that none of the documents used to guide PHNs in teaching new parents contained specific information on safe sleep practices. The death was classified as Undetermined.

Three recommendations were forwarded to the Quality Improvement and Patient Safety and Integrated Risk Management Unit of the Fraser Health Authority: 1) to include information on safe sleeping practices in the materials used by PHNs; 2) that PHNs should discuss safe sleeping practices when meeting with new parents either by phone or in person; and 3) that specific

information on safe sleeping practices be integrated into the training curriculum for the Public Health Units.

Use of Hospital Bed Restraints

Case #12: In April 2009, an adult male patient at Vancouver General Hospital (VGH) was transferred to 100 Mile District Hospital for long term care. He had suffered a stroke in January 2009, resulting in muscle weakness and cortical blindness. After several falls, the patient was restrained in his bed for his own safety. At the time of transfer, family advised 100 Mile District Hospital that the patient had been restrained at VGH, and requested the practice continue. 100 Mile District Hospital staff believed that restraint was not permitted, and did not restrain the patient. Two days after the transfer, the patient fell to the floor beside his bed, striking his head. He subsequently suffered episodes of decreased consciousness before declining rapidly, dying five days after the fall. The death was classified as Accidental.

One recommendation was forwarded to the Interior Health Authority: 1) to conduct a thorough review of existing restraint policy, ensuring it addresses restraining patients for their own safety, and that all staff are familiar with the policy.

Medical Management of Asthma

Case #13: In June 2010, a 7 year old female died at BC Children's Hospital (BCCH) following an acute asthmatic attack. The child had been diagnosed with bronchial asthma in 2006, and was prescribed bronchodilator and corticosteroid inhalers. In case of severe attack, advice was given that the child be taken to a hospital emergency. Initially the child's health seemed to improve, but by 2009 her medical records indicated that she required use of the bronchodilator almost daily, and by late 2009 she was having daily asthma attacks. The child was prescribed new medications, and follow-up in early 2010 indicated that her condition had improved. In May 2010, the child was seen for an exercise-induced asthma attack, and was described as having no cough or shortness of breath. Two weeks later she suffered an acute asthma attack, and collapsed at home. She was transported to hospital by ambulance, but died two days later. The death was classified as Natural.

Two recommendations were forwarded to the College of Physicians and Surgeons of British Columbia: 1) to emphasize to their members the importance of educating patients and families in recognizing severity of symptoms and use of inhalers in cases of paediatric asthma; and 2) to

consider a review of this case to determine if the management of asthma was in accordance with published guidelines.

Industry

Safe Use of Scaffolding

Case #14: In June 2009, the owner and sole employee of a home painting and repair company fell from scaffolding and struck his head, sustaining a non-survivable injury. The man had assembled the scaffolding himself. In B.C., Occupational Safety and Health Regulations have guidelines regarding safe use of free-standing scaffolding, which had not been followed. No instructional stickers were observed on the scaffolding itself, although there were partly-worn warning labels on the frames. It was also noted that individuals purchasing or renting scaffolding might not examine online or hardcopy instructions regarding the assembly and safety requirements of scaffolding. At the time of the coroner's investigation, WorkSafeBC was working on an online slide-show demonstrating the potential tipping problems of stacked scaffolding. The death was classified as Accidental.

Two recommendations were forwarded to the manufacturer: 1) to make clear in written instructions that appropriate securement be used when stacking scaffold sections; and 2) to include a diagram illustrating the need for additional precautions when stacking scaffolds on the frame of scaffolding itself. A third recommendation was forwarded to WorkSafeBC: 3) to consider sending a copy of the newly developed scaffold hazard alert, as well as the Coroner's Report on the case, to construction equipment rental outlets and retail stores selling scaffolding.

Recreation

Scuba Diving Safety

Case #15: In November 2008, a male dive instructor teaching a class surfaced quickly from a 100-foot dive and advised his students he was in medical distress. The instructor was towed to shore, given CPR, and airlifted to Vancouver General Hospital, where his death was pronounced shortly after his arrival. The instructor's medical records indicated a history of heart disease, and he had recently undergone a stress test with abnormal results. Records from his diving certification in 2003 indicate that the signing physician found no significant effects of heart disease, and he was cleared to dive. The cause of death was air embolism due to rapid ascent, and the death was classified as Accidental.

Five recommendations were forwarded to WorkSafeBC: 1) to amend the Occupational Health and Safety (OHS) Regulations to include recreational diving instructors; 2) that under the amended regulations, recreational diving instructors be required to undergo medical certification; 3) to develop a medical certification guideline specifically for recreational diving instructors; 4) that the medical certification guide ensure that recreational diving instructors undergo regular medical examination; and 5) that the guidelines stipulate that the medical must be completed by a physician competent in diving medicine.

Safety at Olympic Luge Track

Case #16: In February 2010, during a training session prior to commencement of Olympic competition, a male athlete on the Whistler luge track lost control on a curve and was ejected from the track. He impacted a metal post outside of the track and sustained non-survivable injuries. It was determined that the athlete had followed the prescribed routine of initially sliding from the lower starts, progressing higher up the track, adding more speed and difficulty as he progressed. The track itself was constructed to be fast and technically difficult, and was developed with the participation of two international Federations overseeing the sport of luge. During construction of the track, a number of concerns arose regarding possible modifications required to ensure the athlete safety. As is typical with all new tracks, adjustments to optimize the placement of crash barriers were done once the behaviour of sleds on the track could be observed. Certification of the Whistler Sliding Centre track took place in March 2008, and a number of items were identified at that time for improvement, including additional crash barriers and extension of existing roll-over barriers and vertical walls in some sections, all of which were completed. The certification process also found that the track was capable of producing speeds that exceeded the designer's calculations by at least 10%, and that the ice profiles at the curves must be optimized or serious crashes at high speeds could occur. The death was classified as Accidental.

One recommendation was forwarded to the Whistler 2010 Legacies Society: 1) to undertake a comprehensive safety audit of the track to address the possibility of crashes inside the track, and the possibility of athletes or sleds to leave the track. A second recommendation was jointly issued to the Fédération Internationale de Luge de Course and the Fédération Internationale de Bobsleigh et de Tobogganing: 2) to review current practices for track certification, and all other aspects of their involvement in track design and construction, and consider incorporating additional safety measures such as independent, safety-oriented audits of track design and construction, and the effectiveness of crash barriers and other safety features. A third recommendation was forwarded to the Fédération Internationale de Luge de Course: 3) to

require compulsory, venue-specific training prior to major competitions, with special attention to events involving newly-constructed tracks.

Commercial Fishing

Vessel Safety

Case #17: In February 2004, three men died when their commercial fishing vessel capsized. The boat had a four-man crew, and was fully loaded with fish. The boat was noted to be listing to one side, and the captain had radioed another vessel expressing concern about the slow rolling motion of his boat. About an hour later, the vessel entered turbulent water, and was struck by a series of large waves which caused it to heel to starboard. The captain was unable to right the vessel. He ordered the crew to don survival suits and prepare to abandon ship, and broadcast a may day call. As there were only three survival suits, the captain donned a floater jacket. The crew attempted to launch the lifeboat but it was pulled underwater when the boat capsized. Search and Rescue personnel arrived at the scene 2 hours later. One man was found alive, but the other three were pulled from the water deceased. It was subsequently determined that two of the men who died were wearing old and/or compromised survival suits, while the third deceased was the captain, who had not had a survival suit. The investigation found that the vessel was one of four built at the same time; two of the four had capsized within two years of construction. Investigations into the sinkings suggested the vessel was difficult to manoeuvre when heavily loaded, and large waves would significantly compromise the vessel's stability.

Four recommendations were forwarded to Transport Canada: 1) that the construction standard for fishing vessels be amended to reduce the risk of failure of hatch covers, 2) to review and revise vessel stability training and certification for commercial fishers, 3) to require that commercial fishing vessels carry one immersion suit for each person on board, and 4) review the testing procedures and standards for survival suits. Two recommendations were jointly issued to Transport Canada and WorkSafeBC: 1) to continue to support the Fish Safe Stability Education Program, which was developed to promote health and safety in the industry; and 2) to review and revise their inspection processes to ensure emergency drills are conducted, and all required emergency equipment is present and properly maintained.

Crew Communication

Case #18: In January 2008, one man died when a commercial fishing vessel capsized near Gabriola Island. The vessel had a crew of five, plus a government observer. At the time of the

incident, one crew member was out in a skiff, assisting with setting the net. Due to the quantity of fish, some net had to be re-spooled. Weather conditions deteriorated, with high winds, blowing rain and high waves. Difficulties were experienced with the spooling and the boom, resulting in a starboard list. Although the master ordered the release of the net, the cumulative effects of weather, the starboard list, and flooding of fish holds resulted in the vessel capsizing and sinking. The skiff operator rescued four of the five persons who were washed overboard or jumped into the water when the boat sank, none of whom were wearing life jackets or survival suits. The remaining crew member could not be located, and was found, deceased, the next day. Investigation determined that a self-inflating life-raft did not initially inflate, because the mother vessel did not immediately sink. This life-raft was equipped with an Emergency Position Indicating Radio Beacon (EPIRB) which is activated when the raft inflates. The EPIRB was not equipped with Global Positioning Satellite technology. The death was classified as Accidental.

Two recommendations were forwarded to Transport Canada: 1) that all Emergency Position Indicating Radio Beacons aboard life rafts be equipped with global position satellite features to assist in determining the exact position of the raft during rescue operations; and 2) that during night fishery operations, radio communication be established between fishing vessels and their tenders to facilitate clear communication between crews.

Transportation

Improvements to Roadway

Case #19: In September 2009, the male driver of a minivan northbound on Highway 5 was passing slower traffic. The driver clipped a northbound motor home making a left turn at Roundtop Road South. He lost control and veered into a ditch at the northwest corner of the intersection. The minivan landed on its roof in a pile of boulders. The section of highway was a legal passing zone; however, there was no warning sign to indicate an approaching intersection. Road and weather conditions, and the health and ability of the driver were all ruled out as factors in this incident. The death was classified as Accidental.

One recommendation was made to the Ministry of Transportation: 1) to install a warning sign on Highway 5 south of Roundtop Road South, for northbound traffic, indicating a T-intersection on the left hand side of the highway.

Public Warning: Vehicle Maintenance

Case #20: In February 2010, a vehicle travelling within the speed limit in the right lane of Highway 99 suddenly accelerated and veered into the left lane. Flames appeared to be coming out of the engine compartment. The vehicle continued through the George Massey Tunnel, striking the east and west walls, and came to a stop approximately 100 metres inside the tunnel, where it became completely engulfed in flames. Rescue of the lone vehicle occupant was impossible due to the fire. The fire was likely caused by leaking engine oil that ignited on coming in contact with the hot exhaust manifold. The death was classified as Accidental.

One recommendation was forwarded to the Insurance Corporation of BC: 1) to consider issuing a reminder to motor vehicle owners that leaking oil on a hot engine can result in a fire while driving, and that the consequences of such a fire, although an uncommon occurrence, can be catastrophic.

Rail Transport

Locomotives Requiring Event Recorders

Case #21: In June of 2006, a freight train derailed near Lilloet, killing two of the three crew members onboard. The crew were experienced, and performed routine pre-trip tests and inspections with no reported concerns. The locomotive had worn brake shoes replaced earlier that month; otherwise the train had no mechanical defects reported prior to the incident. On the day of the incident, the engineer had reduced train speed to 15 miles per hour (mph) and conducted a brake test prior to the train's descent from Kelly Lake to Lillooet – a 32 mile grade. The speed limit for this section was 20mph. Train speed was maintained for approximately two miles, when it began to increase. The engineer continued to apply engine and rail car brakes, and placed the brakes in emergency stop when the train reached 26mph. After approximately two more miles, train speed reached 35mph. The conductor exited the locomotive, disconnected the loaded rail car from the locomotive and was last seen climbing over the rail car, attempting to reach the handbrake at the rear. The rail car derailed while travelling approximately 50mph and fell approximately 1,000 feet down an embankment. The locomotive continued to increase its speed to approximately 60mph, and both the trainman and the engineer jumped from the train prior to its derailment at a left curve in the tracks. The locomotive travelled 800 feet down an embankment and sustained massive damage. The engineer survived his injuries; the deaths of the conductor and trainman were classified as Accidental. The locomotive event recorder (LER), which records standard monitoring functions, was recovered; however, due to excessive heat damage from the post-crash fire, data could not be retrieved. As a result, the Transportation

Safety Board faced enormous challenges in recreating the sequence of events and technically validating how the locomotive was controlled.

One recommendation was forwarded to the Transportation Safety Board, Canadian National Railway, and Canadian Pacific Railway: 1) that all locomotives (other than those confined to yard service) manufactured prior to 2008 be retro-fitted with crashworthy Locomotive Event Recorders, to ensure that required technical information is available to railway investigators.

Air Transport

Standards for Pilot Training & Stall Warning Device

Case #22: In October 2007, a floatplane carrying two pilots and one passenger crashed into the side of a mountain. The mechanical condition and air-worthiness of the plane played no part in the crash. It is believed that the floatplane stalled as it was trying to gain altitude and execute a 180-degree turn. The early warning stall horn likely did not give enough time to recover from the stall due to the low altitude of the aircraft. The floatplane was not equipped with a linear stall warning device, which could have given the pilots an earlier warning that they were approaching a stall. The deaths were classified as Accidental.

Two recommendations were forwarded to Transportation Canada, Safety and Security: 1) to establish standards for pilot training that include mountain flying training; and 2) to evaluate the feasibility of requiring that all aircraft flying over mountainous terrain be equipped with a linear stall warning device such as an "angle of attack indicator."

Public Safety Bulletins

The BCCS issues public safety bulletins in response to single incidents, environmental conditions, and recent trends in preventable deaths. These bulletins are released to media province wide and can be found on the BCCS website at www.pssg.gov.bc.ca/coroners/public-safety/index.htm. There was one public safety bulletin issued in 2010.

July 9, 2010 – Splash into Summer Safely: Tips for Water Activities

As temperatures climbed, the BCCS cautioned British Columbians heading to lakes and rivers to be careful when participating in water-related recreation. In 2009, there were 66 deaths as a result of activities in and around water, 42% of which occurred during July and August. Of those, 68% were the result of drowning during activities such as swimming, power boating, diving and white-water rafting, among others. A link to a statistical report on water-related deaths was provided for those seeking more information:
http://www.pssg.gov.bc.ca/coroners/publications/docs/stats-water-related-fatalities-2009.pdf

Additionally, the Canadian Red Cross offered the following safety tips to prevent water related injuries and deaths: http://www.redcross.ca/article.asp?id=18499&tid=024

- When boating, ensure everyone in the boat has their properly fitted lifejacket on and fastened.
- Do not consume alcohol before or during swimming or boating activities.
- Be cautious about swimming in currents, and know what to do if you get into trouble.
- Get trained through swimming and water safety lessons. Get your Pleasure Craft Operator Card if you operate a boat. Know how to respond in an emergency by taking first-aid lessons.
- Ensure children are supervised, whether at home or on vacation. Adult supervision is the best protection for children – even for those who can swim.
- Ensure that your backyard pool is fully fenced with a self-closing, self-latching gate.
- When not using your home pool, clear all toys out of the water and away from the edge. These can often tempt children to the water's edge.
- Ensure you have emergency equipment including a first aid kit and a phone in the immediate pool area.

Research

The BCCS is active in research, both within our organization and in collaboration with outside agencies. The purpose of our research is to inform injury and death prevention, with the ultimate goal of improving public safety. We maintain a major database and conduct ongoing reviews of common causes of death, aimed at identifying current trends in death in B.C. When such issues are identified, the agency conducts further research aimed at identifying effective and workable preventative measures. In addition, we respond to requests for information from the public, media, academic researchers, and a variety of organizations with an interest in public health and injury prevention. We also provide statistical information and analysis to other government agencies and ministries.

Examples of research activities in 2010 include:

Presented "Geographic Distribution of Human Factors in Motor Vehicle Fatalities in BC in 2008" at the 2010 BC Injury Prevention Conference. For this project, GIS was used to map three human factors contributing to MVI deaths in BC over a one-year period: speed, impaired driving, and seatbelt use. The geographic distribution indicates a pattern of MVI fatalities along major roadways and clusters of MVI fatalities in urban centres, regardless of the region. Intra-regional differences included: the highest risk of MVI death in the Northern region – particularly with respect to females – and the lowest risk in the Metro region; lack of seatbelt use contributed to virtually none of the fatalities in the Lower Mainland; speed contributed to more MVI fatalities on the west side of the Fraser River. The capacity for GIS to map case-related data such as contributing factors of MVIs allows for not only the identification of high-risk areas, but also indicates the appropriate action to improve safety, such as traffic calming infrastructure, or roadside checks for alcohol and/or drug impairment. Overall, this project demonstrated that spatial analysis can be used to inform the development of evidence-based policy and programs aimed at improving safety and preventing death.

Completed a study of child pedestrian fatalities in collaboration with the BC Injury Research Prevention Unit. The study reviewed the circumstances of all child pedestrian fatalities in a 6-year period, including the driving record for the driver in each instance. The results found that males, Aboriginal children, and children from low-income families were overrepresented among child pedestrian fatalities. The majority of incidents occurred in residential areas. Risky pedestrian behaviour was a factor in 57% of cases, and 33% of children under 10 years of age were not under active supervision. Drivers had significantly more driving violations than a comparison sample. The study demonstrated that child pedestrian fatalities are highly

preventable through the modification of behavioural, social and environmental risk factors. The results of the study were accepted for publication in a peer-reviewed scientific publication in October 2010.

We also continued to provide annual data updates to various agencies such as:

- The Traffic Injury Research Foundation of Canada (TIRF), which receives motor vehicle incident fatality data. TIRF has used data from the BCCS to research alcohol related motor vehicle fatalities since 1974. A fatality database is maintained for all provinces across Canada, providing a comprehensive source of information on alcohol use among persons fatally injured in motor vehicle accidents. This database provides a means of monitoring changes and trends and is a valuable tool for research on alcohol impaired driving. More information can be found on their website at: www.tirf.ca.

- The Canadian Red Cross, which compiles information on drowning deaths nation-wide. This research is used to determine the focus of Red Cross public education strategies and community initiatives, as well as identifying key messages and skills that all Canadians need to stay safe in, on and around the water. The Red Cross also provide other agencies and stakeholders in health promotion and injury prevention with research on drownings. Information on their drowning research and access to their reports can be found on their website at: http://www.redcross.ca/article.asp?id=17352&tid=024.

- The Canadian Community Epidemiology Network on Drug use (CCENDU), which receives monthly illicit drug death statistics. CCENDU is a collaborative project involving federal, provincial and community agencies with interests in drug use, health and legal consequences of use, treatment and law enforcement. These reports allow real-time tracking of illicit drug deaths. The goals of CCENDU are to: facilitate the collection and dissemination of information on drug use at the local, provincial and national levels; to serve as an early warning system concerning emerging trends; and ultimately to support and encourage sound policy and program development related to drug use. Their webpage can be viewed at: www.ccsa.ca/Eng/Priorities/Research/CCENDU/Pages/default.aspx

STATISTICS

The statistics in this section are subject to change until all investigations are complete.

General Statistics

Each year the BCCS investigates approximately 25% of all deaths in the province. In 2010, there were 31,428[5] deaths in B.C., 7,825 of which were reported to the BCCS.

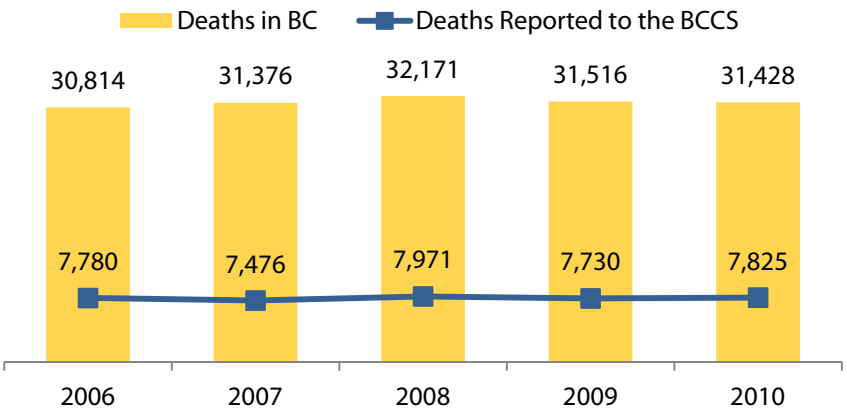


Figure 11. Total number of deaths in B.C. and deaths reported to the BCCS, 2006-2010.

[5] B.C. Vital Statistics Agency (n.d.). *Selected Vital Statistics and Health Status Indicators: Annual Report 2010.* Retrieved May 16, 2012 from http://www.vs.gov.bc.ca/stats/annual.

Table 14. Number and classification of deaths reported to the BCCS, 2006-2010.

Classification	2006	2007	2008	2009	2010
Accidental	1,383	1,317	1,388	1,448	1,594
Homicide	115	102	121	132	115
Natural	5,688	5,420	5,819	5,480	5,419
Suicide	461	476	483	510	530
Undetermined[6]	133	161	160	160	167
Total	7,780	7,476	7,971	7,730	7,825

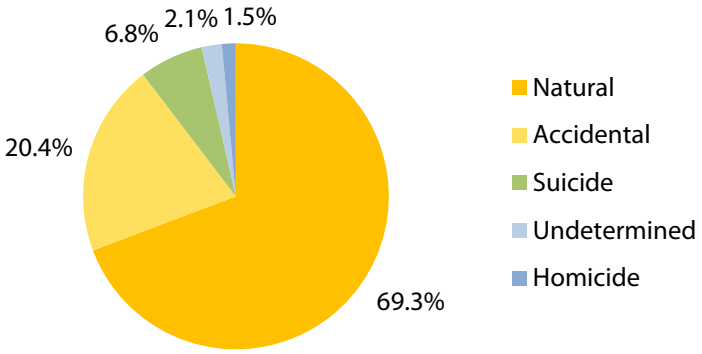


Figure 12. Percentage of deaths reported to the BCCS by classification, 2010.

Table 15. Death rate per 100,000 population[7] by classification, 2006-2010.

Classification	2006	2007	2008	2009	2010
Accidental	32.6	30.6	31.7	32.5	35.2
Homicide	2.7	2.4	2.8	3.0	2.5
Natural	134.0	125.8	132.7	122.9	119.6
Suicide	10.9	11.0	11.0	11.4	11.7
Undetermined	3.1	3.7	3.6	3.6	3.7
Total	183.3	173.5	181.8	173.3	172.7

[6]Some deaths classified as Undetermined may become otherwise classified as investigations progress.
[7] BC Stats (n.d.). *Population Estimates by Health Authority.* Retrieved May 25, 2012 from http://www.bcstats.gov.bc.ca/. These population estimates are for the B.C. Health Authority areas, which approximate the BCCS regions.

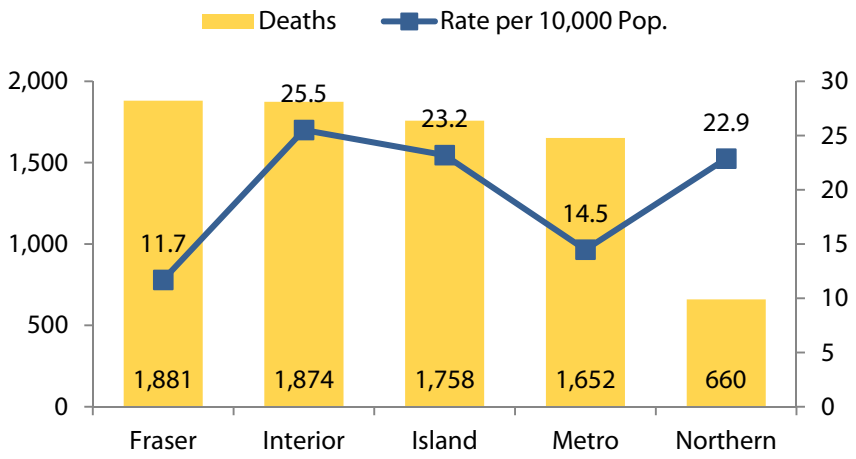


Figure 13. Number of deaths and death rate per 10,000 population by region[8], 2010.

Table 16. Classification of deaths by region of death, 2010.

Region	Accidental	Homicide	Natural	Suicide	Undetermined
Fraser	424	37	1,258	108	54
Interior	410	9	1,306	119	30
Island	320	14	1,293	112	19
Metro	282	40	1,158	137	35
Northern	158	15	404	54	29
Total	1,594	115	5,419	530	167

[8] Deaths reported to the Chief Coroner's Office (151 cases) have been assigned the region corresponding to the township of injury for the purpose of this report.

Accidental Deaths

On September 1, 2010 the BCCS Classification Guideline was revised regarding deaths of persons who sustain injuries due to a fall, and whose health was compromised by significant pre-existing natural disease. These deaths were previously classified as natural, and are now classified as accidental. The most common causes of accidental death in 2010 were:

- falls = 36.4%,
- motor vehicle incidents (MVIs) = 23.6%, and
- alcohol, drug or other poisoning = 21.8%.

Older adults, aged 70 or over, accounted for 75.8% of deaths due to falls. Additionally, 7.8% of accidental deaths were due to injuries incurred while participating in recreational activities, and 3.2% were due to occupational injuries that occurred on the job.

Table 17. Top ten accidental means of death, 2006-2010.

Means Of Death	2006	2007	2008	2009	2010
MVI	430	422	373	389	376
Fall	266	243	325	421	580
Alcohol/Drug/Other Poisoning	371	358	330	345	347
Drowning[9]	68	45	78	56	67
Fire	25	39	53	48	33
Airway Obstruction	35	30	36	25	39
Air	19	16	25	14	15
Exposure: Cold	9	15	18	21	11
Avalanche	6	7	18	15	12
ATV/Dirt Bike	9	9	9	18	8

[9] *Drowning* excludes cases where the means of death involved a vehicle or a fall.

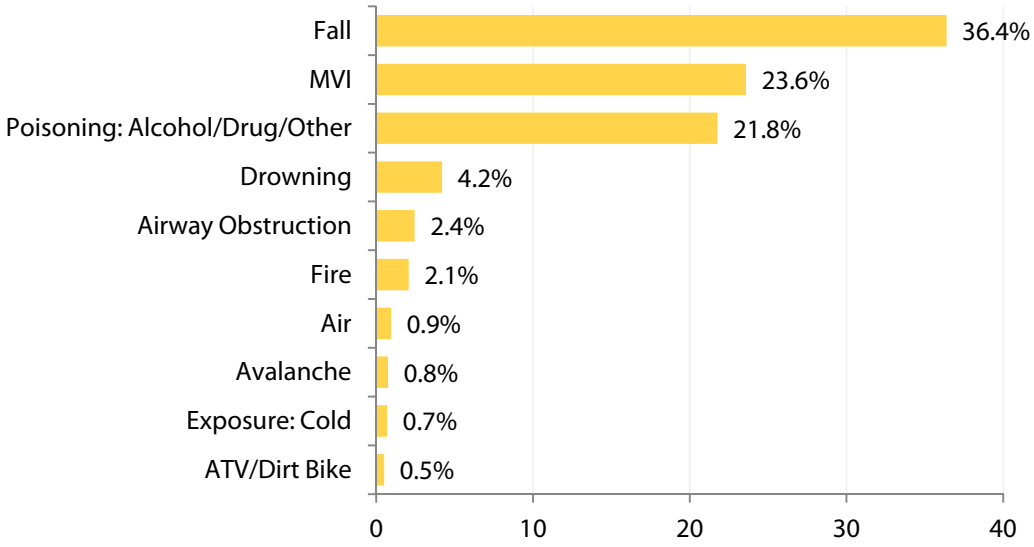


Figure 14. Top ten accidental means of death in 2010 (%).

Table 18. Accidental poisoning deaths by poisoning type, 2006-2010.

Poisoning Type	2006	2007	2008	2009	2010
Illicit Drugs	222	199	179	195	199
Prescription Drugs	82	96	91	88	81
Alcohol & Drugs	33	22	22	30	30
Alcohol	17	29	25	22	24
Over-the-Counter Drugs	8	9	7	6	7
Other	9	3	6	4	6
Total	371	358	330	345	347

Table 19. Accidental occupational worksite deaths by activity, 2006-2010.

Activity	2006	2007	2008	2009	2010
Construction	13	10	15	7	11
Forestry	8	13	19	4	8
Industrial	8	8	3	7	7
Mine, Quarry, Oil/Gas	6	5	8	1	2
Business/Service	1	3	4	2	6
Agriculture	2	3	3	3	-
Construction: Road	2	2	3	-	2
Commercial Fishing	1	2	3	-	1
Commercial Vessels: Other[10]	1	1	2	2	-
Emergency Response	2	-	-	-	2
Railway	3	1	-	-	-
Firefighting (Forestry)	-	-	-	1	2
Firefighting (Non-Forestry)	1	-	-	-	1
Commercial Scuba Diving	-	1	1	-	-
Other	14	5	5	4	9
Total	62	54	66	31	51

[10] *Commercial Vessels: Other* includes all non-fishing vessels (e.g., tugboats and barges).

Table 20. Accidental recreational deaths by activity, 2006-2010.

Activity		2006	2007	2008	2009	2010
Air[11]	Airplane	12	12	-	9	10
	Ultra-Light Aircraft	-	2	4	-	2
	Other	1	3	-	2	1
	Air Subtotal	13	17	4	11	13
Land	Dirt Bike/ATV/Off-Road[12]	18	12	13	23	11
	Hiking/Climbing	10	4	8	6	4
	Bicycling (No MVI)	4	4	-	5	2
	Horseback Riding	3	1	1	2	1
	Skateboarding	1	1	-	3	2
	Other	2	3	1	3	1
	Land Subtotal	38	25	23	42	21
Snow/Ice	Snowmobiling	5	9	17	16	13
	Skiing	7	9	7	7	11
	Snowboarding	3	-	3	2	6
	Other	1	1	2	2	1
	Snow/Ice Subtotal	16	19	29	27	31
Water	Swimming	9	10	17	11	14
	Power Boating	4	6	12	11	14
	Canoe	3	1	4	2	6
	Scuba Diving	4	3	-	3	5
	Rowboat	3	1	3	2	3
	Fishing[13]	1	1	1	4	5
	Diving	2	-	2	4	3
	Kayak	1	5	1	2	1
	White-Water Rafting	-	2	1	2	-
	Raft	-	1	2	-	1
	Personal Water Craft	1	-	1	2	-
	Other	1	2	3	2	1
	Water Subtotal	29	32	47	45	53
Other	Hot Tub	6	-	1	1	3
	Other	2	2	7	2	3
	Other Subtotal	8	2	8	3	6
Total		104	95	111	128	124

[11] *Air* does not include occupational deaths, i.e., pilots or worker transport cases.
[12] *Dirt Bike/ATV/Off-Road* includes MVI cases where the decedent was using an off-road vehicle.
[13] *Fishing* includes fishing from shore, on ice, and in water, but not from a watercraft. The latter are counted in the appropriate watercraft category (e.g., canoe, power boating, etc).

Accidental Death: Cyclist Helmet Use

The Statistics Canada 2009 Community Health Survey found that 58.8% of cyclists in B.C. reported wearing a helmet, considerably higher than the national average of 36.5%[14].

Between 2007 and 2010, 62.5% of persons fatally injured while riding a bicycle were not wearing a helmet (mountain biking incidents have been excluded). The most common causes of death were:

- blunt injuries (53.8%) and head injuries (38.5%) for decedents wearing helmets, and
- head injuries (50.0%) and blunt injuries (33.3%) for decedents not wearing helmets.

Table 21. Helmet use in cyclist deaths, 2007-2010.

Helmet Used	2007	2008	2009	2010	%
Yes	5	3	4	1	27.1
No	9	5	9	7	62.5
Unknown	1	1	2	1	10.4
Total	15	9	15	9	100.0

Table 22. Helmet use by cycling incident type, 2007-2010.

Incident Type	Helmet	2007	2008	2009	2010	%
Motor Vehicle Incident	Yes	3	3	4	1	29.7
	No	8	5	5	5	62.2
	Unknown	-	1	1	1	8.1
	Subtotal	11	9	10	7	100.0
No Motor Vehicle Involvement	Yes	2	-	-	-	18.2
	No	1	-	4	2	63.6
	Unknown	1	-	1	-	18.2
	Subtotal	4	-	5	2	100.0
Total		15	9	15	9	

[14] Statistics Canada (2009) Canadian Community Health Survey (CCHS). Retrieved October 23, 2012 from http://www.statcan.gc.ca/pub/82-625-x/2010002/article/11274-eng.htm.

Accidental Drowning Deaths

There were 80 deaths in B.C. due to accidental drowning in 2010, including deaths while participating in recreational activities. The average number of deaths for the preceding four years was 81 deaths per year.

The Interior region had the highest rate of accidental drowning deaths in B.C. in 2010.

Table 23. Accidental drowning deaths by region, 2006-2010.

Region	2006	2007	2008	2009	2010
Fraser	11	12	13	8	15
Interior	28	17	34	26	31
Island	22	16	22	26	14
Metro	17	14	11	10	12
Northern	11	8	13	5	8
Total	89	67	93	75	80

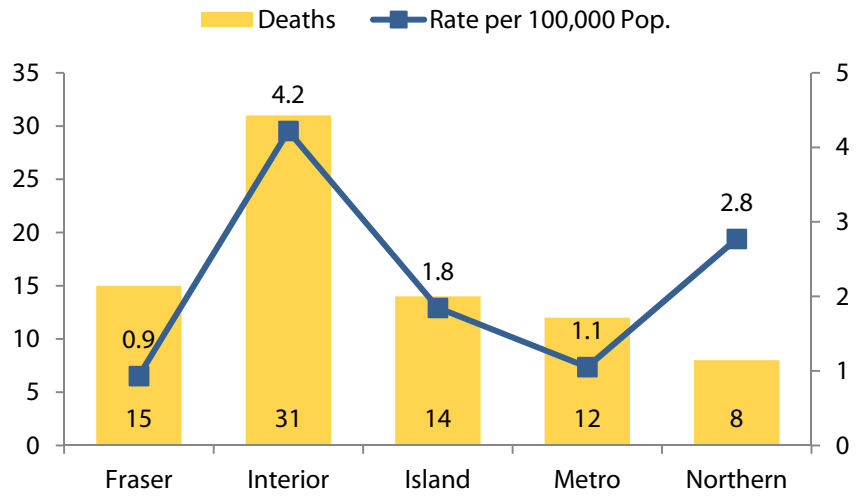


Figure 15. Accidental drowning deaths and death rate by region, 2010.

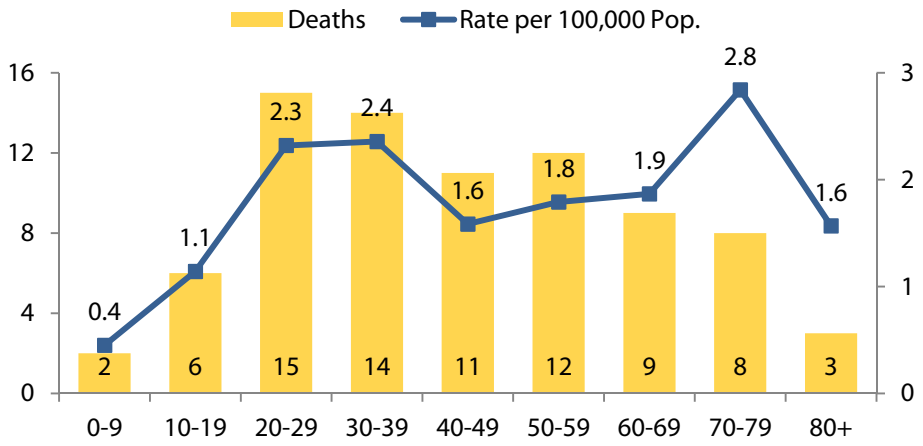


Figure 16. Accidental drowning deaths and death rate by age group, 2010.

Table 24. Accidental drowning deaths by age group, 2006-2010.

Age Group	2006	2007	2008	2009	2010
0-9	2	-	2	3	2
10-19	6	9	8	4	6
20-29	19	13	23	15	15
30-39	14	13	15	5	14
40-49	22	10	12	15	11
50-59	11	5	12	23	12
60-69	8	12	9	7	9
70-79	4	3	7	3	8
80+	3	2	5	-	3
Total	89	67	93	75	80

In 2010, accidental drowning deaths were 86.3% male and 13.8% female. Most deaths occurred in June, July, and August.

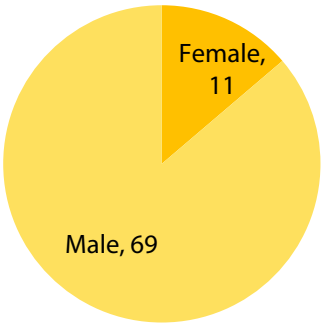


Figure 17. Accidental drowning deaths by gender, 2010.

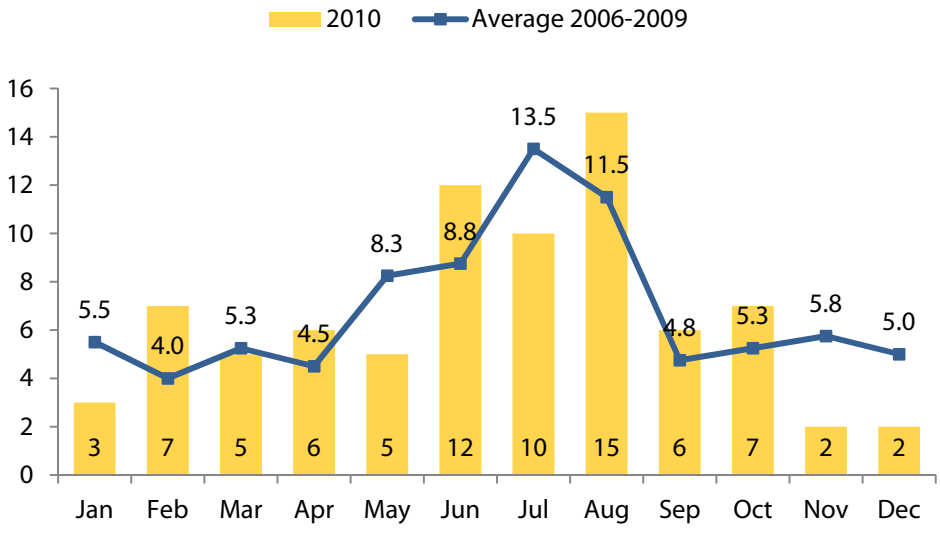


Figure 18. Accidental drowning deaths by month in 2010.

The most common circumstances resulting in accidental drowning were recreational activities, which accounted for 47 deaths in 2010.

Table 25. Accidental drowning deaths by activity, 2006-2010.

Activity	Activity Type	2006	2007	2008	2009	2010
Recreational	Swimming	9	7	15	11	13
	Power Boating	4	3	6	8	11
	Canoe	3	1	4	2	5
	Scuba Diving	4	2	-	3	5
	Fishing[15]	1	-	1	4	5
	Dinghy	2	1	2	2	2
	Kayak	1	4	1	2	1
	Diving	1	-	2	2	1
	Motorbike/ATV/Off-road	-	2	3	-	1
	Raft	-	1	3	-	1
	Other	2	6	7	4	2
	Recreational Subtotal	27	27	44	38	47
Occupational	Commercial Fishing	2	1	4	-	1
	Other	1	3	1	3	2
	Occupational Subtotal	3	4	5	3	3
Other	Fall into Water	24	10	17	12	10
	Motor Vehicle[16]	16	16	12	9	11
	Bathtub	5	5	5	4	4
	Float Plane	-	-	-	6	-
	Fall into Pool	2	1	1	-	1
	Hot Tub	5	-	1	1	2
	Houseboat	-	1	1	1	1
	Near Drowning	2	1	1	-	-
	Other	2	1	3	1	1
	Unknown	3	1	3	-	-
	Other Subtotal	59	36	44	34	30
Total		89	67	93	75	80

[15] *Fishing* includes fishing from shore, on ice, and in water, but not from a watercraft. The latter are counted in the appropriate watercraft category (e.g., canoe, power boating, etc).

[16] *Motor Vehicle* drowning usually results from a vehicle entering a body of water or overturning into a ditch filled with water.

Accidental Motor Vehicle Incident Deaths

Of the 1,594 accidental deaths in B.C. in 2010, 23.6% were the result of traffic-related motor vehicle incidents (MVIs)[17].

There has been a downward trend in MVI fatalities in B.C. between 2001 and 2010. This decrease is consistent with the national trend[18].

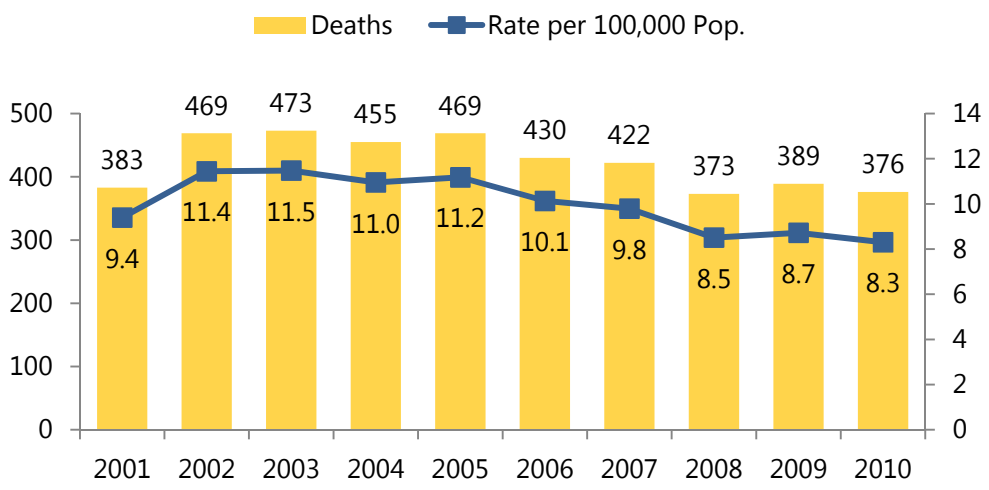


Figure 19. MVI deaths and death rate, 2001-2010.

While the greatest number of fatalities occurred in the Interior region, the Northern region had the highest death rate per 100,000 population. The Interior region had the second highest death rate. Rural areas in many jurisdictions have higher MVI fatality rates than urban areas. Suggested causal factors include:

- larger proportion of highway travel, which increases both speed and public interface with heavy commercial vehicles, and
- longer emergency response times and greater distance to medical facilities[19].

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[17] Refer to the glossary in Appendix I for a detailed definition of *Motor Vehicle Incident* deaths.

[18] Transport Canada (2011) *Canadian Motor Vehicle Traffic Collision Statistics: 2009.* Retrieved March 16, 2012 from http://www.tc.gc.ca/eng/roadsafety/tp-tp3322-2009-1173.htm.

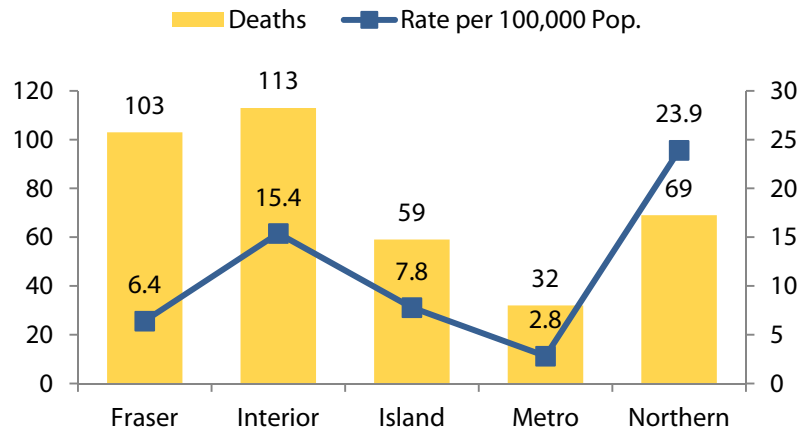

Figure 20. MVI deaths and death rate by region, 2010.

Table 26. MVI deaths by region, 2006-2010.

Region	2006	2007	2008	2009	2010
Fraser	97	107	99	86	103
Interior	137	128	113	145	113
Island	60	64	59	64	59
Metro	61	54	42	39	32
Northern	75	69	60	55	69
Total	430	422	373	389	376

Table 27. MVI death rate per 100,000 population by region, 2006-2010.

Region	2006	2007	2008	2009	2010
Fraser	6.5	7.1	6.4	5.5	6.4
Interior	19.8	18.2	15.6	19.7	15.4
Island	8.3	8.8	8.0	8.5	7.8
Metro	5.7	5.0	3.8	3.5	2.8
Northern	26.7	24.5	21.1	19.2	23.9
Total	10.1	9.8	8.5	8.7	8.3

[19] Northern Health Authority (2005). *Crossroads Report on Motor Vehicle Crashes in Northern B.C.* David Bowering, Chief Medical health Officer.

Table 28. MVI deaths by position in vehicle or vehicle type, 2006-2010.

MVI Type	2006	2007	2008	2009	2010
Driver	188	203	178	178	165
Passenger	92	79	75	73	92
Pedestrian	67	66	55	55	55
Motorcycle, Moped	39	48	39	47	37
Bicyclist	14	11	9	10	7
Other	17	4	8	11	7
Commercial Driver	13	4	6	8	11
Motorized Wheelchair	-	4	1	6	1
Commercial Passenger	-	3	2	-	1
Bus	-	-	-	1	-
Total	430	422	373	389	376

MVI fatalities were 65.2% male and 34.8% female, which is a similar gender ratio to previous years and other jurisdictions[20].

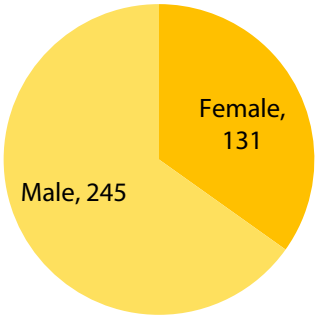

Figure 21. MVI deaths by gender, 2010.

[20] Statistics Canada (2012) *Motor vehicle accidents causing death, by sex and by age group.* Retrieved July 13, 2012 from http://www.statcan.gc.ca/tables-tableaux/sum-som/l01/cst01/health112c-eng.htm.

The largest proportion of deaths occurred in the 46-55 age group, which accounted for 19.4% of the total. This marks a change in recent years: prior to 2009, the largest proportion of fatalities typically occurred in the 16-25 age group.

The 76-85 and 86+ age groups had the highest death rates for 2010, at 16.6 and 12.6 deaths per 100,000 population, respectively. The overall MVI death rate across the province was 8.3 people per 100,000 population. This is consistent with trends observed for the preceding four years: the death rate in the two oldest age groups is consistently higher than the provincial average.

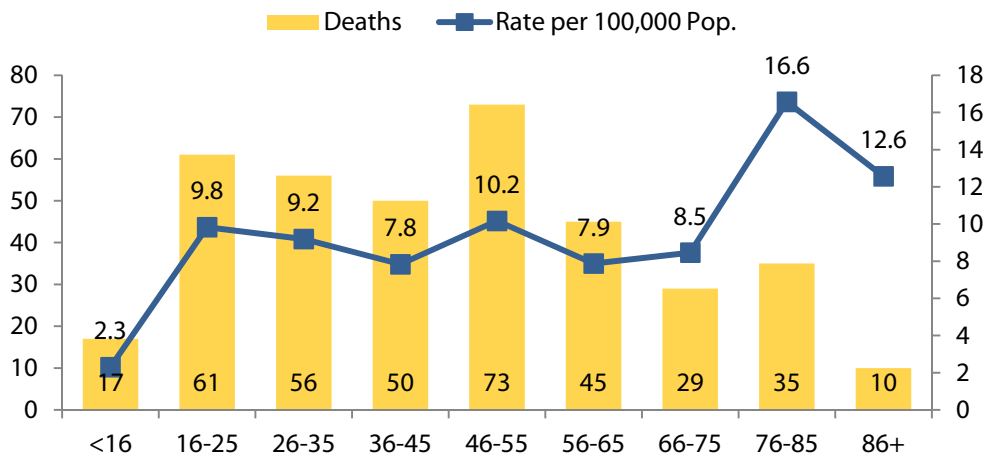

Figure 22. MVI deaths and death rate by age group, 2010.

Table 29. MVI deaths by age group, 2006-2010.

Age Group	2006	2007	2008	2009	2010
<16	14	14	15	9	17
16-25	106	107	89	72	61
26-35	59	58	52	51	56
36-45	67	69	54	59	50
46-55	62	75	57	80	73
56-65	52	39	47	43	45
66-75	22	23	23	25	29
76-85	39	24	23	34	35
86+	9	13	13	16	10
Total	430	422	373	389	376

In 2010, August had the highest incidence of MVI deaths.

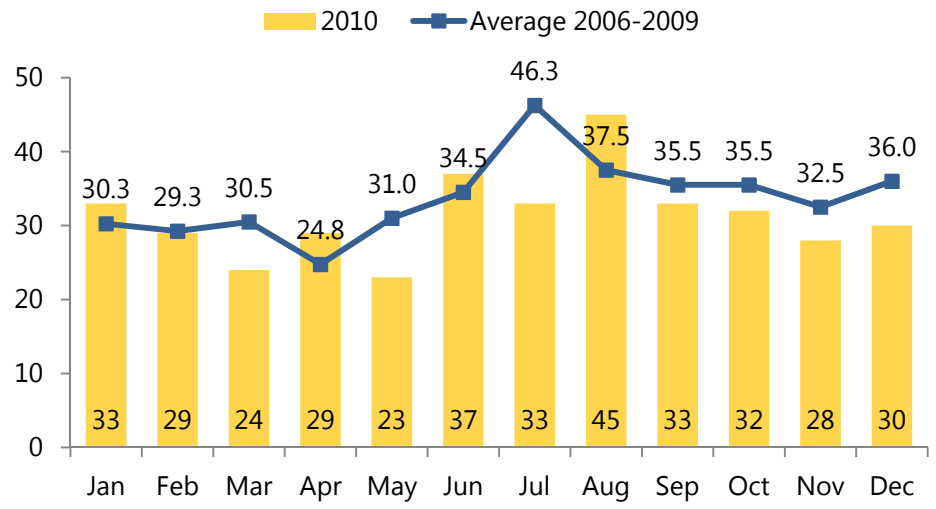

Figure 23. MVI deaths in 2010 by month.

In 2010, alcohol contributed to 19.4% of MVI deaths, drugs[21] to 7.2% of deaths, and drugs and alcohol combined to 8.2% of deaths. In their most recent statistical report on MVIs[22], ICBC reported that alcohol was the second-most common human factor, after excessive speed, in fatal collisions.

Table 30. MVI deaths with alcohol and/or drugs contributing, 2006-2010.

Contributing Factor	2006	2007	2008	2009	2010
Alcohol	89	97	83	89	73
Drugs	19	31	23	25	27
Alcohol & Drugs	28	38	44	28	31
Total	136	166	150	142	131

[21] *Drugs* includes over-the-counter and prescription medications, as well as illicit drugs.
[22] ICBC (n.d.) *Traffic Collision Statistics: Police-Attended Injury and Fatal Collisions 2007*. Retrieved March 16, 2012 from www.icbc.com/road-safety/safety-research/collision-statistics.

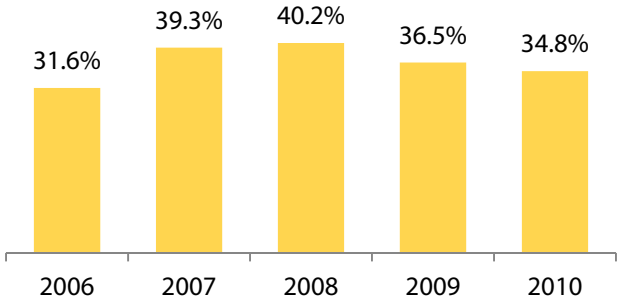

Figure 24. MVI deaths with alcohol and/or drugs contributing, 2006-2010 (%).

In 2010, the Fraser region had the largest proportion of MVI fatalities with alcohol and/or drugs contributing. The Metro and Island regions had the smallest proportion.

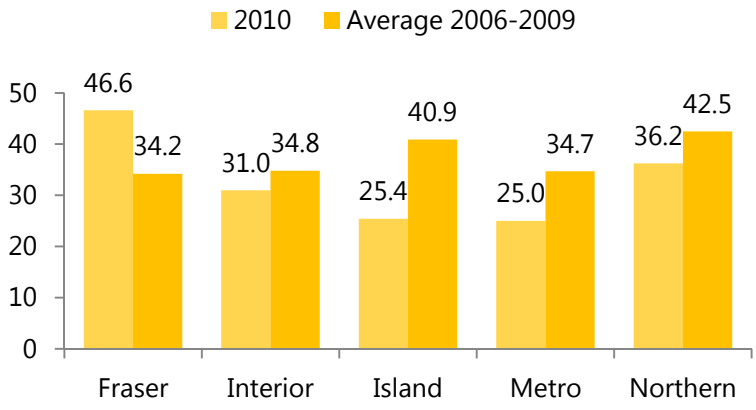

Figure 25. MVI deaths with alcohol and/or drugs contributing by region (%).

Table 31. MVI deaths with alcohol and/or drugs contributing by region, 2006-2010.

Region	2006	2007	2008	2009	2010
Fraser	27	37	42	27	48
Interior	42	50	41	49	35
Island	24	27	26	24	15
Metro	16	20	18	14	8
Northern	27	32	23	28	25
Total	136	166	150	142	131

In 2010, over half of all MVI fatalities involving the 16-25 and 26-35 age groups had alcohol and/or drugs as a contributing factor.

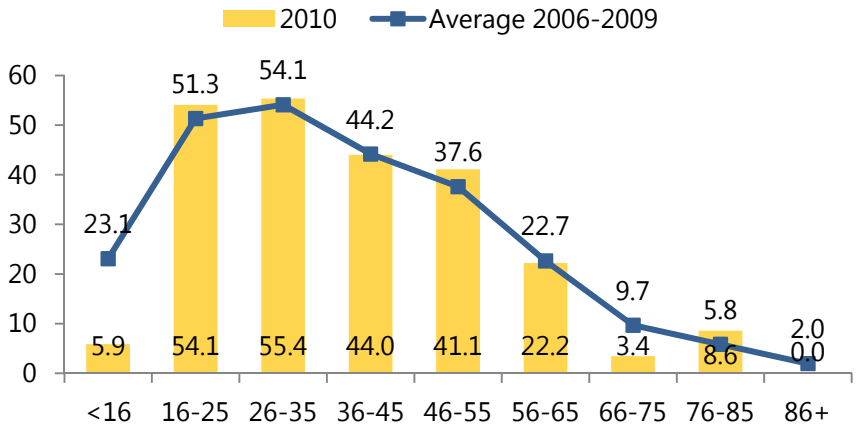

Figure 26. MVI deaths with alcohol and/or drugs contributing by age group (%).

Accidental Motor Vehicle Deaths: Seatbelt Use

A survey conducted by Transport Canada in 2009 and again in 2010 found that 96.9% of motor vehicle occupants observed in B.C. were using seatbelts, slightly higher than the national average of 95.3%[23].

In 2010, 34.6% of people fatally injured in an MVI were not using a seatbelt. Seatbelt use was unknown for 8.1% of fatalities.

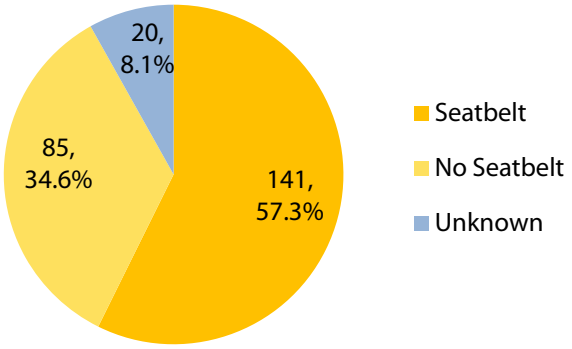

Figure 27. MVI deaths by seatbelt use, 2010.

[23] Transport Canada (2011). Results of Transport Canada's Rural and Urban Surveys of Seat Belt Use in Canada 2009-2010. Retrieved March 7, 2012 from http://www.tc.gc.ca/eng/roadsafety/tp-tp2436-rs201101-1149.htm.

The percentage of decedents wearing seatbelts was highest in the Fraser (64.6%) and Northern (66.0%) regions.

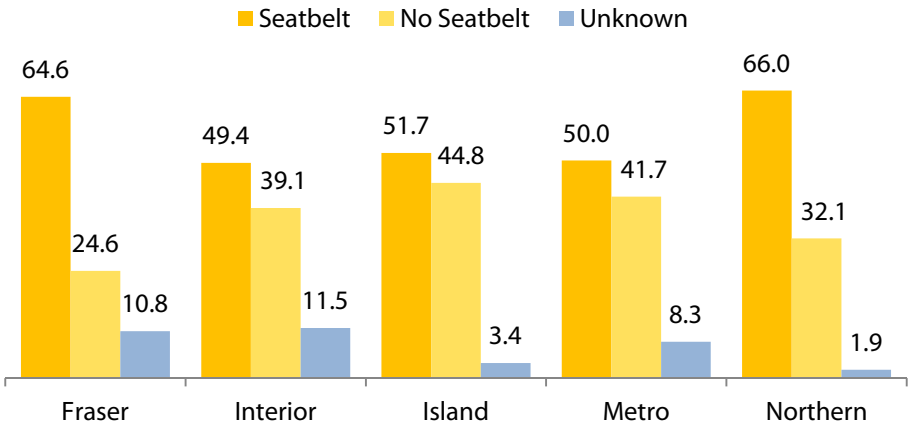

Figure 28. MVI deaths by region and seatbelt use, 2010 (%).

Table 32. MVI deaths by region and seatbelt use, 2010.

Region	Seatbelt Use			Total
	Yes	No	Unknown	
Fraser	42	16	7	65
Interior	43	34	10	87
Island	15	13	1	29
Metro	6	5	1	12
Northern	35	17	1	53
Total	141	85	20	246

Males (53.1%) were less likely than females (65.1%) to be wearing a seatbelt.

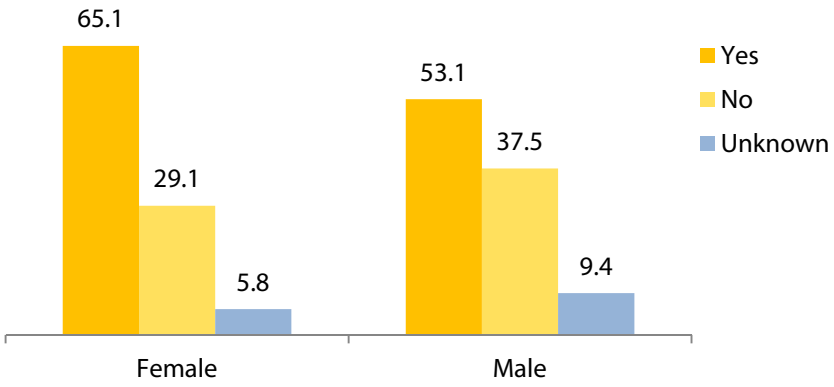

Figure 29. MVI deaths by gender and seatbelt use, 2010 (%).

Table 33. MVI deaths by gender and seatbelt use, 2010.

Region	Seatbelt Use			Total
	Yes	No	Unknown	
Female	56	25	5	86
Male	85	60	15	160
Total	141	85	20	246

The 26-35 age group were the least likely to have used their seatbelt, with just 38.1% known to have used one. In contrast, decedents aged 66-75 years were the most likely to have used their seatbelt, 88.9%.

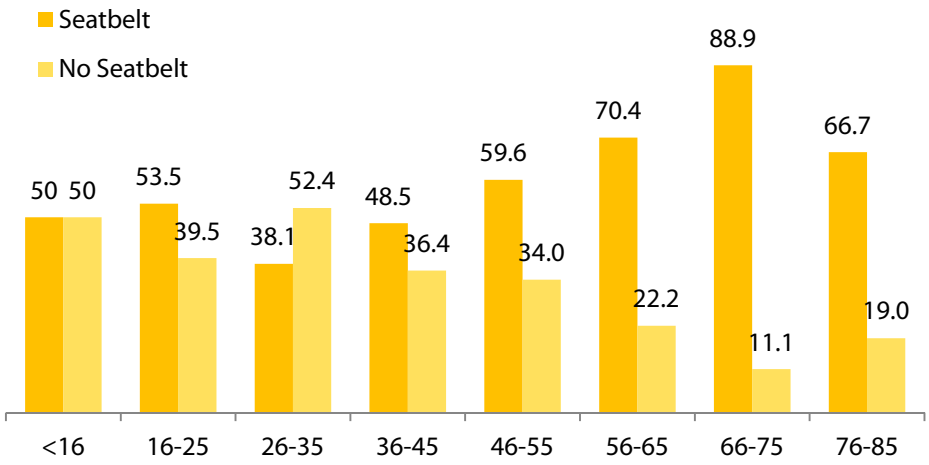

Figure 30. MVI deaths by age group and seatbelt use, 2010 (%).

Table 34. MVI deaths by age group and seatbelt use, 2010.

Age Group	Seatbelt			Total
	Yes	No	Unknown	
<16	4	4	-	8
16-25	23	17	3	43
26-35	16	22	4	42
36-45	16	12	5	33
46-55	28	16	3	47
56-65	19	6	2	27
66-75	16	2	-	18
76-85	14	4	3	21
86+	5	2	-	7
Total	141	85	20	246

Persons fatally injured in an MVI in which alcohol and/or drugs were a contributing factor were less likely to be wearing a seatbelt (42.3%) than those who died in MVIs in which alcohol and/or drugs were not a factor (67.1%).

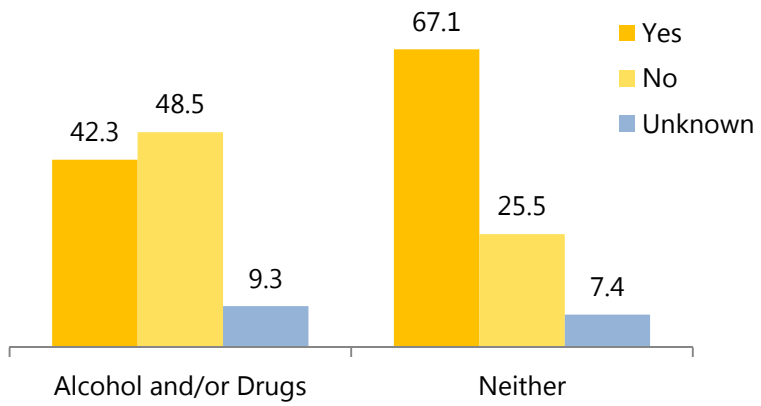

Figure 31. MVI deaths with alcohol and/or drugs contributing by seatbelt use, 2010 (%).

Table 35. MVI deaths with alcohol and/or drugs contributing by seatbelt use, 2010.

Alcohol and/or Drugs	Seatbelt			Total
	Yes	No	Unknown	
Yes	41	47	9	97
No	100	38	11	149
Total	141	85	20	246

Motorcycle Deaths

In 2010, there were 37 deaths resulting from motorcycle crashes, a 21.3% decrease from 2009. Active motorcycle licences were held by 8.1% of drivers, and motorcycle deaths represented 9.8% of all MVI deaths. This count does not include off-road motorcycles such as dirt bikes, unless these were being operated on a public highway/street at the time of the incident.

While the number of motorcycle deaths has increased since 2001, the number of insured motorcycles[24] has also increased, rising from 49,200 in 2001 to 95,800 in 2010. The rate of fatalities has remained relatively stable over this time period.

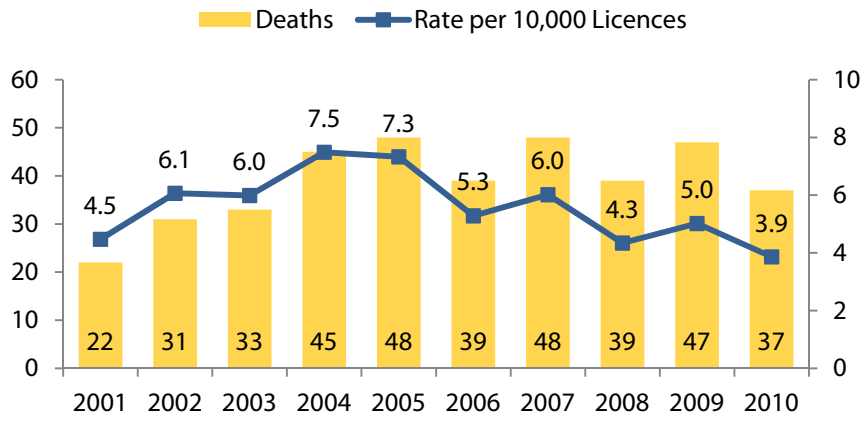

Figure 32. Motorcycle deaths and death rate, 2001-2010.

[24] Data on the number of insured motorcycles for 2001-2010 were provided by ICBC. Counts are rounded to the nearest hundred.

Table 36. Motorcycle deaths by region, 2006-2010.

Region	2006	2007	2008	2009	2010
Fraser	8	13	8	9	7
Interior	14	16	13	21	14
Island	6	10	8	8	11
Metro	7	6	6	6	3
Northern	4	3	4	3	2
Total	39	48	39	47	37

Motorcycle fatalities were 86.5% male and 13.5% female.

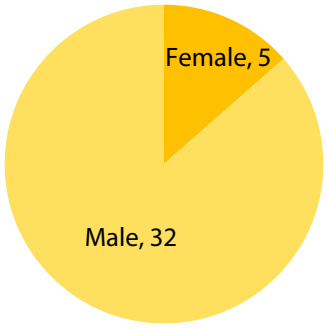

Figure 33. Motorcycle deaths by gender, 2010.

In 2010, the 46-55 age group had the largest proportion of deaths, accounting for 32.4% of the total. The 16-25 and 26-35 age groups had fewer deaths than would be predicted from the previous 4-year average.

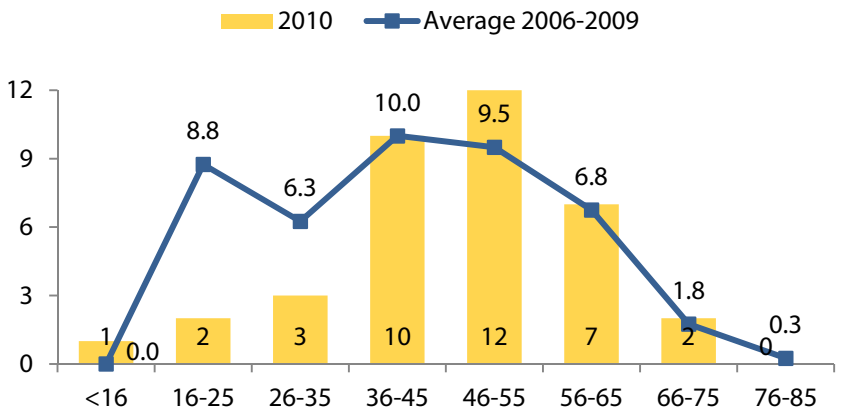

Figure 34. Motorcycle deaths by age group, 2010.

In 2010, the month of June had the highest incidence of motorcycle deaths, while November, December, and January had the lowest, with no deaths occurring during these months. Additionally, there were fewer motorcycle deaths in July and August than the previous 4-year average.

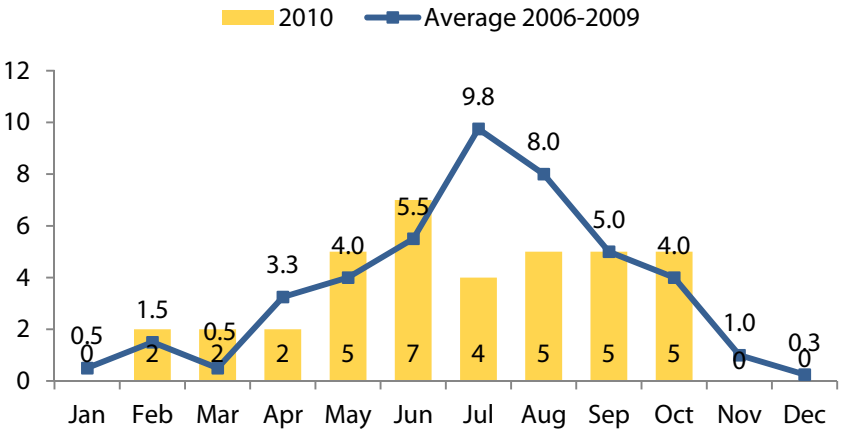

Figure 35. Motorcycle deaths by month, 2010.

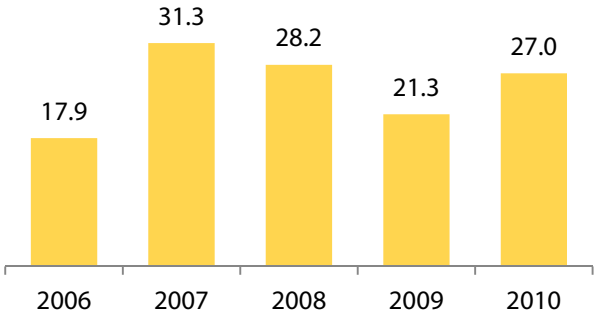

Figure 36. Motorcycle deaths with alcohol and/or drugs contributing, 2006-2010 (%).

Table 37. Motorcycle deaths with alcohol and/or drugs contributing, 2006-2010.

Contributing Factor	2006	2007	2008	2009	2010
Alcohol	4	8	9	7	5
Drugs	2	2	-	2	3
Alcohol and Drugs	1	5	2	1	2
Total	7	15	11	10	10

Child Deaths

The BCCS investigates the deaths of all children in B.C., including natural and expected deaths, to better understand how and why children die. A child is defined as anyone under the age of 19.

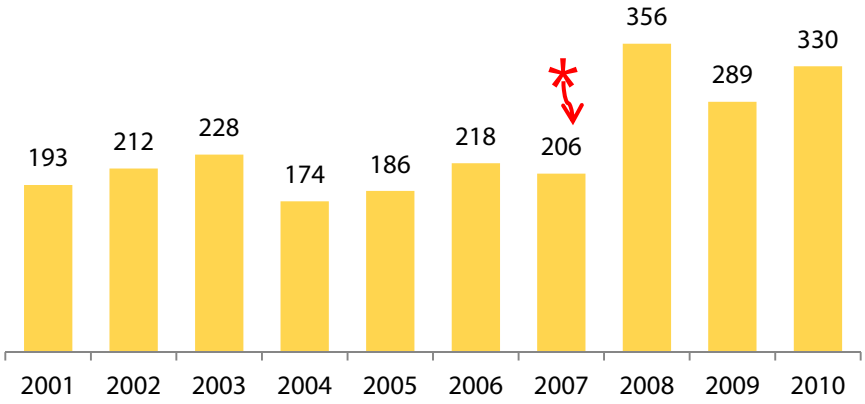

Figure 37. Number of child deaths, 2001-2010.

* In September of 2007, a revision to the Coroners Act specified that all child deaths must be reported to the BCCS. As a result of this legislative change, a greater number of child deaths are investigated each year, beginning 2008, than in previous years. This increase is primarily in natural deaths.

Table 38. Child deaths by classification, 2006-2010.

Classification	2006	2007	2008	2009	2010
Accidental	72	72	84	54	59
Homicide	15	5	12	8	10
Natural	89	80	212	188	210
Suicide	15	11	14	11	31
Undetermined	27	38	34	28	20
Total	218	206	356	289	330

In 2010, there were 330 child deaths in B.C. Of these, 56.4% were male and 43.3% were female. Gender was unknown for one child, or 0.1%.

The largest proportion of child deaths in 2010, 54.8%, was infants under the age of 1 year. The 15-18 age group had the second highest proportion of deaths, 23.3%.

There were an unusually high number of youth suicide deaths in 2010; the reason for the increase is unknown.

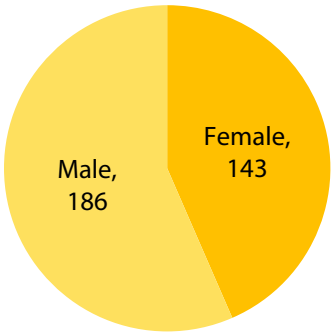

Figure 38. Child deaths by gender, 2010[25].

Table 39. Child deaths by age group and classification, 2010.

Age Group	Accidental	Homicide	Natural	Suicide	Undetermined	Total
<1	2	1	161	-	17	181
1-4	10	-	11	-	1	22
5-9	4	1	17	-	-	22
10-14	11	-	10	6	1	28
15-18	32	8	11	25	1	77
Total	59	10	210	31	20	330

[25] Gender was unknown for one decedent. This individual is not displayed in the pie chart.

Table 40. Child deaths by age group, 2006-2010.

Age Group	2006	2007	2008	2009	2010
<1	70	80	176	158	181
1-4	22	16	32	26	22
5-9	16	14	28	19	22
10-14	25	24	31	20	28
15-18	85	72	89	66	77
Total	218	206	356	289	330

In 2010, the Metro region had the highest number of child deaths in B.C. The location of B.C. Children's Hospital within the Metro region contributes to the number of deaths in this region.

Table 41. Child deaths by region, 2006-2010.

Region	2006	2007	2008	2009	2010
Fraser	51	44	88	49	68
Interior	45	39	45	31	46
Island	39	46	63	45	49
Metro	42	44	123	119	125
Northern	41	33	37	45	42
Total	218	206	356	289	330

Table 42. Accidental child deaths by means of death, 2006-2010.

Means of Death	2006	2007	2008	2009	2010
Motor Vehicle Incident[26]	43	42	43	30	34
Alcohol/Drug/Other Poisoning	7	8	10	3	2
Drowning	4	1	7	4	4
Fall	1	6	3	2	5
Fire	3	-	2	7	3
Airway Obstruction	2	4	4	1	3
Backover/Low Speed Collision	1	2	1	1	2
Unintentional Asphyxia	1	2	2	-	-
Crushing	1	-	2	1	-
ATV/Dirt Bike	2	-	2	-	-
Fire Arms	1	1	1	-	-
Medical Treatment	2	1	-	-	-
Railway	1	1	-	-	1
Struck by Falling Tree	-	-	1	1	1
Tractor	-	-	2	1	-
Aircraft Incident	1	-	-	1	-
Machinery/Forklift	-	1	1	-	-
Skiing	-	-	-	-	1
Snowmobile	1	-	-	-	-
Bicycling	1	-	-	-	-
Other	-	3	2	-	2
Under Investigation	-	-	1	2	1
Total	72	72	84	54	59

[26] *Motor Vehicle Incident* includes ATV/Dirt Bike incidents that occurred on public highways.

Deaths due to MVIs are the leading cause of accidental death in children, accounting for 57.6% of accidental deaths in 2010.

Table 43. Child MVI deaths by position in vehicle or vehicle type, 2006-2010.

Position/Vehicle Type	2006	2007	2008	2009	2010
Passenger	19	21	21	12	16
Driver	10	11	14	10	8
Pedestrian	6	7	3	5	6
Bicyclist	4	1	1	2	2
Motorcycle, Moped	1	2	2	-	1
Other	3	-	2	1	1
Total	43	42	43	30	34

Suicide

There were 530 suicide deaths in 2010, 11.7 for every 100,000 people in B.C. The number and rate of suicide deaths have remained relatively stable over the past 10 years.

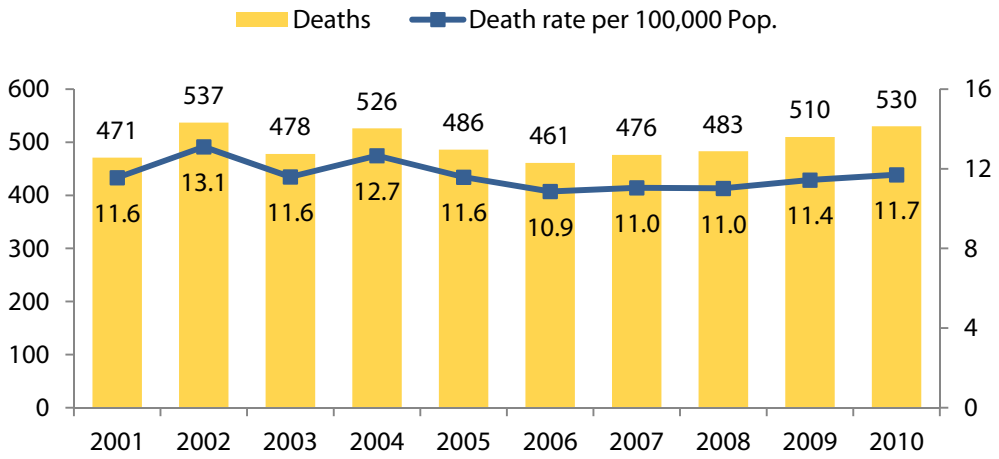

Figure 39. Suicide deaths and death rate, 2001-2010.

The highest suicide rate was in the Northern region, which had 18.7 suicide deaths per 100,000 people in 2010. The lowest regional rate was in Fraser, with 6.7 suicide deaths per 100,000 people.

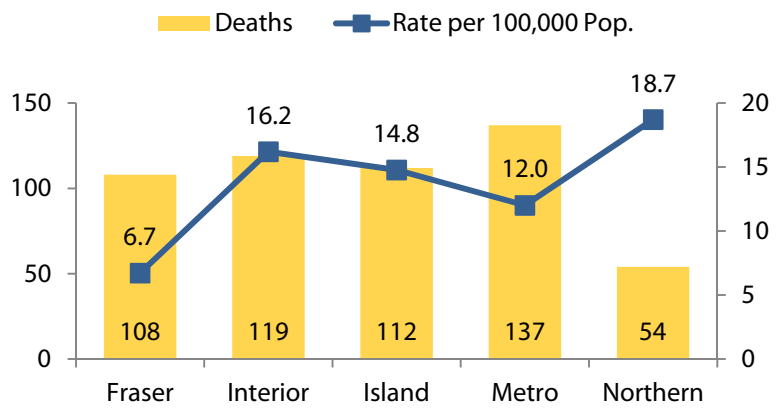

Figure 40. Suicide deaths and death rate by region, 2010.

Table 44. Suicide deaths by region, 2006-2010.

Region	2006	2007	2008	2009	2010
Fraser	120	126	118	129	108
Interior	84	84	95	94	119
Island	90	95	94	106	112
Metro	128	124	124	123	137
Northern	39	47	52	58	54
Total	461	476	483	510	530

Hanging accounted for 38.5% of all suicide deaths in B.C. in 2010. Intentional self-poisoning and firearms were the second and third most common means of death, accounting for 18.1% and 15.1% of cases, respectively.

Table 45. Suicide deaths by means of death, 2006-2010.

Means of Death	2006	2007	2008	2009	2010
Hanging	156	155	161	203	204
Poisoning: Alcohol/Drugs/Other	98	110	100	102	96
Fire Arms	79	68	79	70	80
Fall	39	43	52	40	46
Poisoning: CO[27]	37	33	37	28	29
Suffocation / Smothering	8	12	12	16	22
Cutting/Stabbing	11	12	11	19	14
Drowning[28]	12	21	13	8	11
MVI	8	8	8	7	5
Rail/SkyTrain	6	10	4	4	7
Fire	1	2	1	5	5
Exposure: Cold	1	1	2	1	1
Strangulation	3	-	-	-	2
Electrical	-	1	1	2	-
Other	2	-	2	5	6
Under Investigation	-	-	-	-	2
Total	461	476	483	510	530

[27] *Poisoning: CO* does not include *Fire* or *MVI* deaths.
[28] *Drowning* does not include *Fall* or *MVI* deaths.

Males accounted for 79.2% of suicide deaths in 2010, and females 20.8%. This gender difference in suicide is observed worldwide, with some cultural variation in the degree of disparity[29].

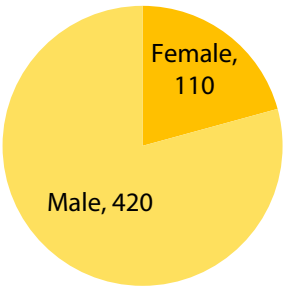

Figure 41. Suicide deaths by gender, 2010.

Table 46. Suicide deaths by age group, 2006-2010.

Age Group	2006	2007	2008	2009	2010
0-9	-	-	-	-	-
10-19	18	17	19	19	36
20-29	60	80	67	65	80
30-39	56	72	61	90	87
40-49	107	106	126	112	95
50-59	102	104	85	107	113
60-69	56	48	62	62	51
70-79	35	32	30	34	39
80+	27	17	33	21	28
Unknown	-	-	-	-	1
Total	461	476	483	510	530

[29] World Health Organization (2011) *Suicide: Country Reports and Charts*. Retrieved March 18, 2012 from http://www.who.int/mental_health/prevention/suicide/country_reports/en/index.html.

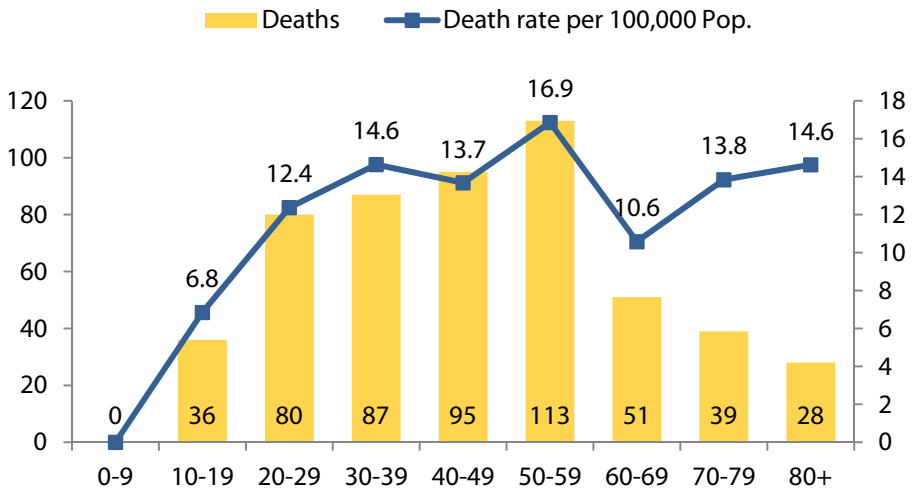

Figure 42. Suicide deaths and death rate by age group, 2010.

The average age of decedents who died by suicide in 2010 was 46.8 years. While the 50-59 age group had the highest overall suicide rate, when broken down by gender, males 80 years and older had the highest rate.

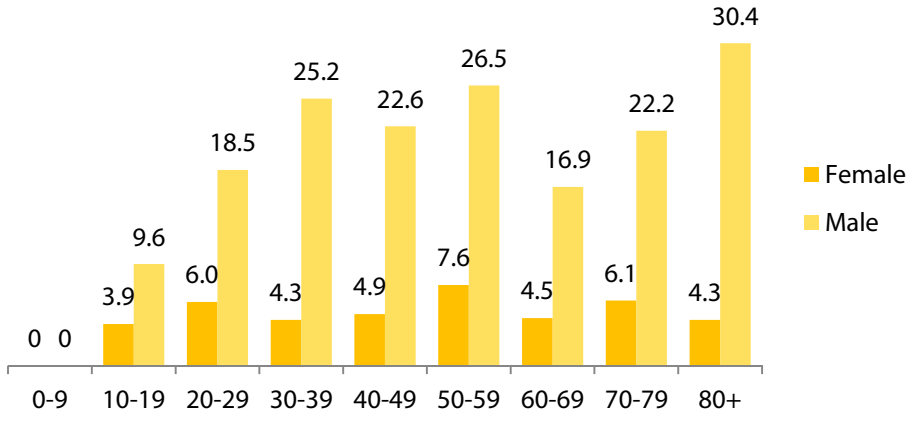

Figure 43. Suicide death rate per 100,000 population by age group and gender, 2010.

Illicit Drug Deaths

There were 219 illicit drug deaths in B.C. in 2010. The number and rate of illicit drug deaths have remained relatively stable over the past 10 years.

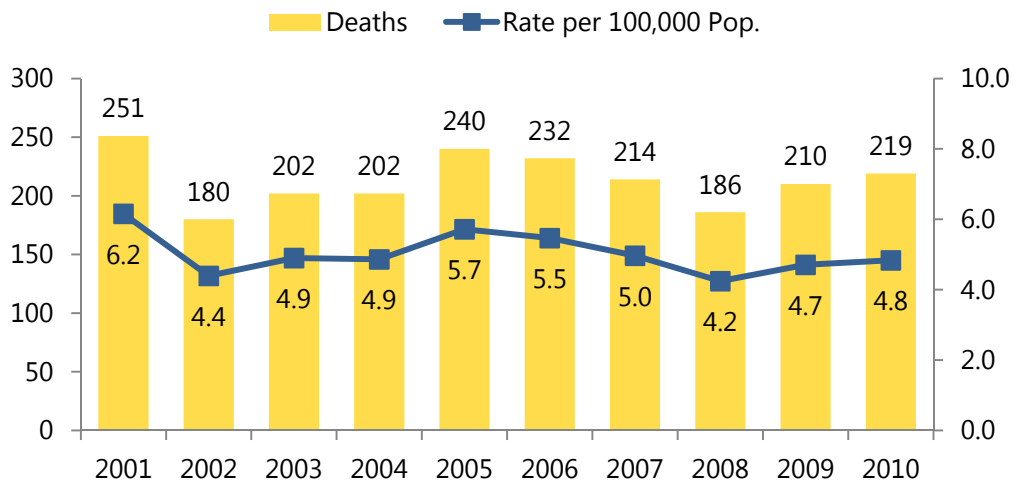

Figure 44. Illicit drug deaths and death rate, 2001-2010.

Table 47. Illicit drug deaths by region, 2006-2010.

Region	2006	2007	2008	2009	2010
Fraser	77	60	62	55	80
Interior	39	34	19	35	37
Island	40	36	46	34	27
Metro	67	69	51	78	64
Northern	9	15	8	8	11
Total	232	214	186	210	219

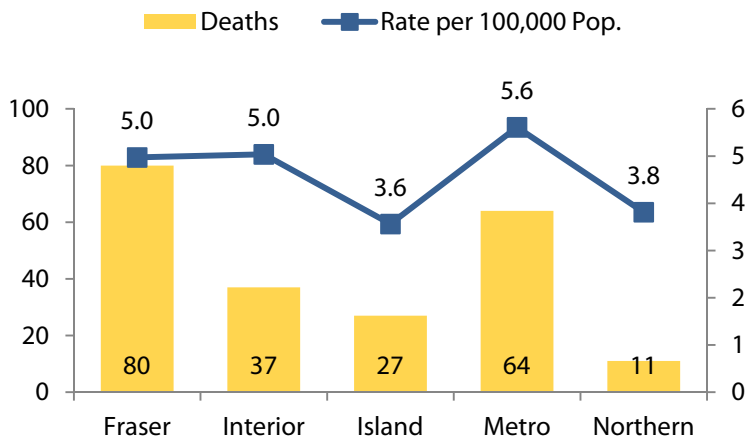

Figure 45. Illicit drug deaths and death rate by region, 2010.

Decedents were three and a half times more likely to be male (77.6%), than female (22.4%).

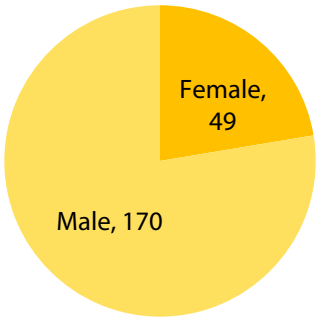

Figure 46. Illicit drug deaths by gender, 2010.

A majority of illicit drug deaths in 2010, 90.9%, were accidental overdose events.

Table 48. Illicit drug deaths by classification, 2006-2010.

Classification	2006	2007	2008	2009	2010
Accidental	222	199	179	195	199
Homicide	-	-	-	-	1
Suicide	5	10	6	8	12
Undetermined	5	5	1	7	7
Total	232	214	186	210	219

In 2010, the 40-49 age group had the highest illicit drug death rate. The average age of death was 41.3 years.

Table 49. Illicit drug deaths by age group, 2006-2010.

Age Group	2006	2007	2008	2009	2010
0-9	-	-	-	-	-
10-19	8	6	7	4	6
20-29	42	35	36	45	38
30-39	53	54	49	53	52
40-49	78	75	42	59	67
50-59	48	39	44	37	48
60-69	3	4	8	12	7
70-79	-	1	-	-	-
80+	-	-	-	-	1
Total	232	214	186	210	219

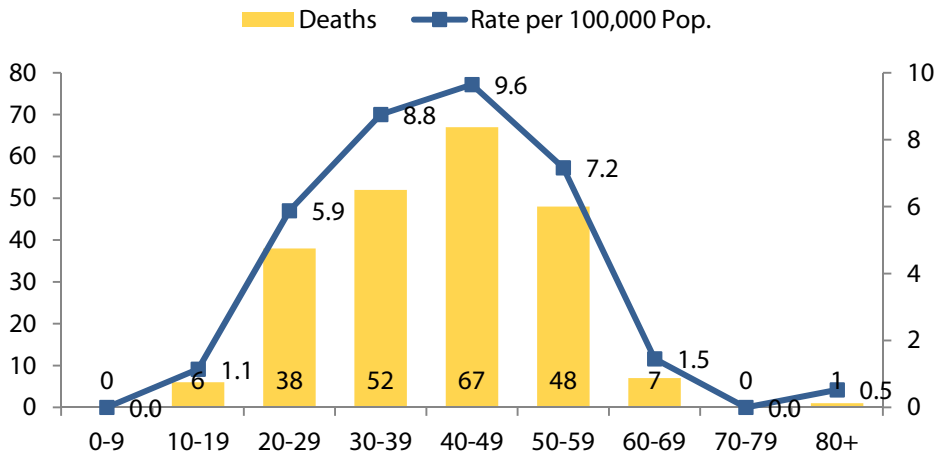

Figure 47. Illicit drug deaths and death rate by age group, 2010.

Appendix I: Glossary

Autopsy: An examination of the body of a deceased person to determine the cause and manner of death and to evaluate any disease or injury that may be present.

Cause of Death: The immediate medical cause of death, e.g., head injury resulting from a motor vehicle accident, asphyxiation due to avalanche.

Classification of Death: Classification of death as one of the following:

> *Accidental*: Death due to unintentional or unexpected injury. It includes death resulting from complications reasonably attributed to the accident.
>
> *Homicide*: Death due to injury intentionally inflicted by the action of another person. Homicide is a neutral term that does not imply fault or blame.
>
> *Natural*: Death primarily resulting from a disease of the body and not resulting secondarily from injuries or abnormal environmental factors.
>
> *Suicide*: Death resulting from self-inflicted injury, with intent to cause death.
>
> *Undetermined*: Death which, because of insufficient evidence or inability to otherwise determine, cannot reasonably be classified as Natural, Accidental, Suicide or Homicide.

Coroner's Report: The coroner's official record of the identity of the deceased and how, when, where and by what means the deceased died. It is a public document that forms the official provincial record of the death. It may include recommendations to agencies to aid in prevention of future deaths.

Means of Death: The event responsible for the Cause of Death, e.g., motor vehicle incident resulting in a head injury, avalanche causing asphyxiation.

Motor Vehicle Incident Death: Includes all deaths involving the operation of a motor vehicle that occur on a public highway or street. This includes incidents on public highways involving off-road vehicles, industrial vehicles, and farm vehicles. Incidents involving the use of an industrial or farm vehicle at a worksite or the off-road use of ATVs and snowmobiles are excluded, as are incidents occurring in private driveways, parking lots, and underground garages, and the deaths of individuals who suffer fatal injury related to a vehicle that was not in operation at the time of injury.

Natural-Expected Death: A death reported to the BCCS from the BC Vital Statistics Agency of someone who died of Natural and expected causes while under medical care. The family physician verifies the cause of death and completes the medical certificate of death.

Occupational Death: Includes all deaths of workers during work hours, and deaths that occur when a worker is in transit to a jobsite in an employer owned or chartered vehicle (e.g. airplane, boat, van, etc). All other motor vehicle incidents that occur on public roads are not included, except where the decedent was an emergency responder en route (e.g., a paramedic or a police officer).

Toxicology: The study of the adverse effects of chemicals on living organisms, particularly the symptoms, mechanisms, treatments and detection of the poisoning of people.

Verdict at Inquest: A summary of the jury's findings regarding how, when, where and by what means the deceased died. Recommendations made by the jury are also included in the Verdict at Inquest. The evidence presented at the inquest is summarized by the presiding coroner and is also included in the Verdict at Inquest. It is a public document that forms the official provincial record of the death.

Appendix II: List of Tables

Appendix III: List of Figures

BRITISH COLUMBIA

Coroners Service

Ministry of Justice