



**OFFICE OF THE CHIEF CORONER
Child Death Review Unit
ANNUAL REPORT**

2006

Dedication



As with all of our reports, we begin with what we know – the death of a child is a profound loss not only to the child’s parents and family, but also to the larger community. In order to reduce the numbers of these tragic losses, we must first understand how and why our children are dying. We must learn from their stories and take that knowledge forward.

On behalf of the Chief Coroner of British Columbia Terry Smith, the men and women of the BC Coroners Service, and the members of the Child Death Review Unit, I want to thank the families of the 244 children whose lives and deaths are reflected in this report. These children lost their lives between 2003 and 2006, most of them through natural causes. They and their families lived across the province in both urban and rural settings. This report is intended to describe the trends and patterns found across the 244 child deaths and to identify practical, tangible prevention strategies designed to improve health and safety outcomes for all B.C. children.

We are grateful to the parents, grandparents and other family members who met with CDRU members to share the memories and stories of their children. We can only try to acknowledge the courage shown by these families as they put their own pain aside in the hopes of making a difference to another.

To the parents - your generosity made it possible for us to better understand how and why your children died. Thank you for the pictures, the stories and the site visits to where young lives were lost. Thank you for helping us to develop a child death review process that is meaningful and inclusive. Your contribution remains invaluable.

Every death of a child in British Columbia matters. As always, this annual report is dedicated to the 244 children, their families, friends and communities whose lives were changed forever. In working to improve the health and safety of all British Columbian children, we have much to learn from these children, who they were in life and in death. We honour their memories.

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Message from a Parent

I write this letter in memory of my son Levi Colton Knapp in hopes that in some way my words or actions can prevent a devastating tragedy that affected my family deeply. Levi was killed on an ATV May 2, 2006 just two weeks before his high school graduation.

First I will tell you a little about my son. He was born on a Marine Corps Base in 29 Palms, California on September 22, 1987. Levi has been a blessing to me from the day he was born; he was so handsome, perfect. I never knew someone could love so true and unconditionally. An incredible day it was for our family, and especially for me.

I had 18 full years with Levi and cherished every moment of it, even when he tested me. The day I lost my son changed my life forever and left a void in my heart, that spot that was reserved just for him. Someone could ask me what my best day was. I had four! The day each of my boys were born. I was honored they chose me to be their mom. Losing Levi, that is my worst day!

All children have their own unique personality. From the start, Levi was one that stepped up and was the leader, the boss; he wanted to get going, never satisfied to sit idle. Moments after he was born, he raised his head up and started to see the world. Full of such energy, he started crawling at 3 months old, walking at 6 months.

Levi lived life to the fullest and with enthusiasm everyday, with fire in his heart, smiles and a determination and drive that left many amazed. He flew by the seat of his pants with no fear, a smile on his face, good people to call friends and a loving family to take with him everywhere he went. Levi was an exceptional son and big brother.

He was so mature, capable, and yet so very young. He could do anything. Give him equipment to run, a horse to break, any job to do. He never shied away from a hard days' work. He accomplished many things and had many interests in his short 18 years. Levi was a business owner, training and shoeing horses was an absolute passion and gift. He was a certified farrier at 16 years old as well as a volunteer firefighter. He enjoyed Army Cadets, 4H and his latest passion, saddle bronc riding.

He had an uncanny knack with anything mechanical. One of his many passions was Mustang cars and Monster trucks. He thought "Why not just put big tires on something and drive it in the mud?". Levi had to try everything at least once. He couldn't sit still wanting to grab it, buy it, break it and then rebuilt it.

Levi wanted to see the world and what it had to offer. He knew how to get things done and lived by the motto, "Improvise, Adapt, and Overcome". Levi always had a plan to be a US Marine. To be one of the "The Few, The Proud". He did not want to join the Marines. You become Marines. The strength of the Corps lies in the individual through Honor, Courage, and Commitment. This was Levi; he was incredibly strong physically and just as strong in his heart and mind. Levi left us a Man and a True Marine at heart. He didn't live long life, but he lived a full life. To a Marine and to Levi, honor is loyalty and dedication to God, Country, Corps, Family and Self. Levi lived with no fear, a smile on his face, loved his family deeply, his friends true. Levi knew that more than blood flowed through a human heart.

As Levi's Mom, I honor him for the man he became and how he got there. His lifetime commitment to become a Marine. The true Cowboy he left us as. They say all the old Cowboys are gone. They forgot to say they take the young Cowboys too.

I want to prevent any future losses if at all possible by being real about my story and writing about my son the amazing young man he is. He had every intention of living a long and happy life. But an accident ended that life and no matter what I tried I failed in preventing it. I don't want anyone else to go through a loss of their child.

Levi wanted a racing quad. I was immediately against it. For a number of reasons. Too fast, too powerful. Inexperience and youthful enthusiasm on a machine that can go 120. You're just asking for trouble. When it came to this ATV I felt there were roadblocks in my way. His ability to get a loan and buy an ATV without my permission all was very frustrating.

I voiced my concern to all involved about the financial issues, the safety aspects and the consequences of an accident. A major injury that could leave him crippled. And of course, what the devastating effects of losing him would be on our family if he was killed.

As often as I disabled the machine and hid his keys, he still managed to find a few days here and there for a ride. I was a constant wreck until he walked back through the door. And it just takes one time to change your life forever. I tried everything I had at my disposal to convince him that he wasn't ready for that ATV; that he needed to do more to prepare for one. I knew him better than he knew himself. I even told him it was going to kill him and 30 days later he was gone.

No matter the level of maturity Levi possessed, he was still a child at 18. And until he gained that maturity to make decisions about his life and safety, it was my job as his mom to guide him, make those decisions in his best interest. He always told me "I will be okay, nothing is gonna happen to me mom! You just worry too much". I have always tried to rely on intuition and common sense. Raising my 4 boys alone, I needed something to foresee possible problems as my children grew up through the stages. I deeply feel I failed in not doing more. I didn't save my son, no matter my concerns or what I did, it wasn't enough. Now I have to live with all the "what ifs". I want to spare another parent the pain of feeling that. Spending months and years wishing more was done.

When Levi started to drive I had the same concerns. But I had recourse to take away his license and the rules of the graduated licensing program backed me up. A minor cannot register a vehicle without a parent's consent. These are all safeguards to keep our children safe. There was nothing to back me up when my 18 year old wanted to buy and operate an ATV. As much as we hope our children listen to us, the truth remains they will listen to someone else first. I truly believe he would still be alive if he was told he had to have a license and training and needed a parent's consent to register the ATV.

I try everyday to live in the new reality that my son is gone. I am trying to find peace in my life again. I just want it back to normal but it will never be the same. You just have a New Normal. Levi's 19th and 20th birthdays came and went and I never got to tell him happy birthday. I didn't get to see him graduate from high school, or on the drill field graduating from boot camp dressed in his military uniform all squared away. You miss out on so much. A wedding, and

grand children that will never be. I will never open another special gift from him at Christmas, on my birthday or just because. Every holiday that passes, every milestone that could have been is all gone because he was killed.

This has been the most horrible time of my life, and I know it's not over yet. I love and miss Levi more than they make words for. It is so hard to put 18 amazing years down on paper. I don't want to forget a memory, those special times I spent with Levi. There is so much I could say and I don't want to leave anything out. So I will commit the rest to memory, I will think of him everyday, laugh and smile at things he did, cry a lot, get mad, and without question, I will never regret a moment I had with him.

Levi is gone and I can't bring him back, but maybe through my loss we can save a child by making changes that will help prevent these accidents and that will be a blessing to me. We aren't supposed to go to our children's funeral. I am not supposed to cry over his ashes, I am supposed to cry at his wedding. This has affected everyone I know. Levi took care of his little brothers but now they take care of him. I want to prevent another family from my pain. So my heart goes out to all those parents suffering the loss of your child. And to the rest of the families, in hopes you will continue to enjoy making memories with your children.

Sincerely, Kimberly Knapp



Levi Knapp

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Executive Summary

This report is a summary of findings arising from the 244 child deaths that were referred to the Child Death Review Unit in 2006. Of these 244 deaths, 63 were Coroner cases, 36 were Non-Coroner cases and 145 were natural expected deaths reported to the CDRU by Vital Statistics. Several key findings emerged from this aggregate review of the 244 child deaths:

Unintentional Injury Deaths

- Death due to unintentional injury was over three times more frequent for males than females;
- Vehicular incidents were the leading circumstance of sudden unexpected death;
- Unsafe speed was the leading risk factor in vehicular incidents;
- A lapse in active supervision was a leading risk factor for drowning;
- Children who died of alcohol poisoning were known to be binge drinking prior to death; and
- Alcohol was a factor in cases of cold exposure deaths reviewed by the CDRU.

Intentional Injury Deaths

- Suicide was the second leading manner of sudden unexpected death;
- Hanging was the most frequent method of suicide; and
- The majority of children who died by suicide had stated their intent prior to their death.

Undetermined Deaths

- The combination of medical and developmental vulnerability with exposure to an unsafe sleep environment was frequent among cases of Sudden Unexpected Death in Infancy (SUDI).

Natural Deaths

- Delay in medical treatment was a risk factor for children who died of natural unexpected causes;
- The highest percentage of child deaths (74 per cent) were natural and expected, the majority of which involved children less than one year of age;
- Prematurity was a leading cause of natural expected death; and
- The majority of natural deaths were determined not preventable.

Aboriginal Children

- Aboriginal children were over represented among cases of sudden unexpected death;
- The majority of Aboriginal children who died as a result of a fatal injury were youths, and two thirds of these children were female;
- Children less than one year of age represented 93 per cent of natural deaths involving Aboriginal children; and
- Alcohol use was a risk factor in 55 per cent of the fatal injuries involving Aboriginal children.

Children Known to the Ministry of Children and Family Development (MCFD)

- The majority of children known to MCFD were in receipt of services through Community Living BC; and
- Children known to MCFD were not over represented among deaths referred to the CDRU.

Review of the 244 deaths resulted in the following recommendations:

To the Ministry of Tourism, Sports and Arts:

The CDRU supports the Ministry of Tourism, Sports and Arts in their ongoing initiative to review best practice guidelines for the use of off-road vehicles (ATVs, snowmobiles and dirt bikes), and recommends that the Ministry move beyond guidelines towards a regulatory framework on licensing and registration of off-road vehicles.

To the Chief Coroner of B.C. and the Office of the Superintendent of Motor Vehicles (Ministry of Public Safety and Solicitor General):

The CDRU recommends that the viability of linking licensing of specific motorcycles to specific training and education be examined as part of the joint project currently underway.

To the Chief Coroner of B.C.:

The CDRU recommends that the specific findings related to exposure deaths of Aboriginal children be provided to the Representative for Children and Youth to inform advocacy strategies for Aboriginal communities in B.C.

To the British Columbia Chiefs of Police:

The CDRU recommends that all law enforcement jurisdictions review current policy to ensure the inclusion of actions required when attending a scene where the victim may be hypothermic.

To the Chief Coroner of B.C.:

The CDRU recommends that coroners provide survivors of suicide with a practical guide for dealing with a suicide death, using best practice resources which are currently available from national suicide prevention agencies in the province.

To the Ministry of Education:

The CDRU recommends that all school districts review policies related to suicide risk assessments to ensure they include the identification and assessment of any acute crises presenting in the child's life.

To the Canada Firearm Centre:

The CDRU recommends the initiation of regulations that require mandatory trigger locks for all firearms at the time of purchase and further that written safe storage guidelines also be provided at point of sale.

To the Chief Coroner of B.C.:

The CDRU recommends that all written reports pertaining to child deaths that are classified as undetermined are reviewed by the child death investigation and paediatric investigation coroners prior to conclusion.

To the Chief Coroner of B.C.:

The CDRU recommends that a Child Death Review Panel be established to review alcohol-related deaths of Aboriginal children and youths in British Columbia.

To the Chief Coroner of B.C.:

The CDRU recommends that in all SUDI deaths, detailed death scene investigations and scene recreations be conducted by coroners who have received specific training in these areas.

Part 1

Child Death Review

1 | History of Child Death Review

Child death review teams were first established during the late 1970s in the United States as a result of concern on the part of parents, health-care workers and other professionals over the increasing number of children who were dying from apparently preventable abuse, neglect or injury. The first interagency child death review team was established in Los Angeles County in 1978. Since then, child death review teams have been formed in most states. The first child death review teams in Canada were created in the 1990s. The basic mission of child death review teams is to review child deaths in order to identify trends and risk factors to prevent similar fatalities.

A 2007 survey conducted by the CDRU found there was significant variation in how the teams are structured, funded, and how they function. Some jurisdictions only review those children who were in care or in receipt of services at the time of their deaths. Some review only sudden and unexpected deaths. Most teams are structured committee style with multi-disciplinary teams reviewing data collected by a co-ordinator. Many US jurisdictions reported on-going challenges with uncertain funding and limitations of legislation. In spite of these issues, most jurisdictions reported improved child death investigations, increased inter-agency co-ordination and a high compliance to recommendations arising out of child death reviews.

2 | Child Death Review and the BC Coroners Service

In 1996, the Children's Commission was created to review all child deaths in British Columbia. In February 2002, based on the recommendations of the Attorney General, the Children's Commission and the Office of the Child, Youth and Family Advocate were eliminated. The Office for Children and Youth was established to absorb a number of key functions, including the monitoring of services provided for children, advocacy, investigation of complaints, education and providing advice to the government on child and youth issues. Although the Coroners Service has always had the mandated responsibility for investigating all sudden, unnatural and unexpected deaths, the additional responsibilities for child death review were transferred to the BC Coroners Service in January 2003.

The CDRU was staffed primarily by a coroner who was supported by other BC Coroners Service staff. The focus of the unit was on developing a child death review program that was based in part on effective public health models that were focused on prevention and evidence-based practices. The unit experienced many of the same challenges other jurisdictions reported, namely related to budgets and limited legislation. The CDRU was however significantly successful in strengthening the child death investigation process including the development of a child death investigation protocol and in reporting out on the cases reviewed between 2003 and 2005.

B.C. Children and Youth Review

In April 2006, the Honourable Ted Hughes OC, QC, LL.D. (Hon.) issued a special report on B.C.'s Child Protection System. He was asked (in part) to examine and make recommendations to improve how child deaths were reviewed including the issue of public reporting. With the recommendations accepted by government, the B.C. Child Death Review Unit remained embedded within the B.C. Coroners Service supported by a budget, seven full-time employees and new legislation.

3 | Interface with BCCS and Other Jurisdictions

Because the CDRU is notified of all child deaths as they occur, the unit is involved in current, on-going monitoring of all unnatural, sudden and unexpected child deaths. Working within the BC Coroners Service allows unit members to:

- Identify trends in child deaths immediately;
- Provide feedback to the Deputy Chief Coroner to improve the quality and consistency of information gathered for future individual and aggregate review;
- Provide information collected from other child death investigation and review jurisdictions intended to strengthen the B.C. Coroners Service response to child death;
- Make informed decisions on topics for special reports based on contemporary themes and areas of risk; and
- Exercise the powers of investigation set out in section 11 of the new Coroners Act, in order to obtain necessary information pertaining to a child's death.

The responsibility to investigate and review child deaths in B.C. is shared by:

- The B.C. Coroners Service;
- The Representative for Children and Youth;
- The Ombudsman of B.C.;
- The Provincial Director of Child Welfare; and
- The Public Guardian and Trustee.

These agencies together with the Provincial Health Officer are members of the Children's Forum, a group formed in response to a recommendation made by Mr. Hughes in the B.C. Children and Youth Review. The Children's Forum meets regularly to support cross-jurisdiction communication, coordination and collaboration.

4 | CDRU Mission, Goals and Objectives

Mission

The CDRU is committed to the comprehensive review of all child deaths to better understand how and why children die, and to use those findings to take action to prevent other deaths and improve the health, safety and well-being of all children in British Columbia. These reviews are founded on best practices from across North America.

Goals

- To monitor classifications and causes of child deaths;
- To develop uniform, consistent and retrievable data collection on risk and protective factors to allow for the formulation of prevention strategies;
- To identify significant risk factors and trends in child deaths;
- To facilitate the linkages of identified patterns and trends in child deaths with agencies and organizations;
- To influence and develop education and prevention strategies to reduce child death; and
- To develop and maintain strong relationships with other child death review jurisdictions in order to benefit from shared best practices.

Objectives

- To conduct evidence based case reviews of all child deaths;
- To identify causal and contributory risk factors that were present in the child's life and death;
- To identify protective factors that were present;
- To obtain all accessible and available information on the child's circumstances and when necessary, exercise the use of authority under the Coroners Act;
- To seek out and invite participation from a child's parents or family;
- To examine child deaths individually and on aggregate in order to identify patterns and trends;
- To determine case dispositions for every child death reviewed and where appropriate, refer cases or clusters of cases to the child death review panel;
- To develop evidence based recommendations that address specific barriers and systemic issues related to a child's life circumstances;
- To provide real time advice and expertise in the support of continuous quality improvement to the B.C. Coroners Service on matters related to child death;
- To facilitate communication and information-sharing among key stakeholders and enhance the coordination of prevention and risk reduction strategies at the local, provincial and national level;
- To identify emerging areas for prevention in British Columbia and support the development of coordinated strategies to target these areas of risk;
- To establish strong partnerships with agencies across the public and private sector for the purposes of enhancing information sharing and best practices within CDRU;
- To inform appropriate jurisdictions of CDRU recommendations that are directed toward them for the purpose of preventing future loss of life; and
- To support all British Columbia jurisdictions who share in the responsibility to investigate or review child deaths.

5 | Moving Forward

The overarching goal of the CDRU is prevention. Recent changes within the unit, including resource-building and new legislative authority under the Coroners Act, have significantly enhanced the CDRU's ability to take more aggressive action on this goal.

In September 2007, the CDRU developed a strategic framework to direct its efforts in the areas of prevention, education and outreach. Taking a population health approach to child death prevention, this framework identifies guiding principles, establishes criteria for priority setting and includes a model for developing multi-level prevention strategies which has shown success for child death review teams in other jurisdictions. With a framework for action in place, the CDRU will now be moving forward with priority setting to determine target areas for action in 2008. The findings of this report, in addition to current research from other agencies, will greatly assist in identifying high risk areas for B.C. children and youth which compel immediate and coordinated action.

In addition to setting priorities for future work, the CDRU is advancing ongoing prevention projects which continue to be relevant given recurring trends of child death. As an example, natural deaths within the first year of life continue to be a concern for the CDRU. These deaths are multi-faceted in nature, and contributory factors are as wide ranging as inadequate access to prenatal or perinatal care, poor maternal health and lack of education regarding safe infant care. One trend that the CDRU is monitoring with increasing concern is the number of infants who die related to unsafe sleeping practices. These practices might include unsafe sleep position (putting baby to bed on his tummy instead of his back) or unsafe sleep environment (bed-sharing, sleeping on inappropriate surfaces, exposure to cigarette smoke). The CDRU is currently working on developing best practice materials to address these deaths.

The CDRU recognizes the extensive work that is being done to address many areas of risk related to child death, involving both government and non-government agencies. To integrate the unit into this network, the CDRU has begun preliminary consultations with various stakeholders for the purposes of information sharing and partnership building, including the First Nations Leadership Council, Ministry of Health and Safe Kids Canada. A coordinated, multi-agency approach to prevention will undoubtedly have a greater impact on the health and safety of B.C. children and youth.

Part 2

Summary of Reviewed Cases

1 | Overview

The Child Death Review Unit (CDRU) was referred a total of **244** cases in 2006. All 244 cases were reviewed individually by the multi-disciplinary team between May and September, 2007.

Of the **244** cases, **63** (26 per cent) were coroner cases and **181** (74 per cent) were determined to be natural expected deaths. Of the **181** natural expected deaths, **36** were non-coroner cases and **145** were deaths reported to the CDRU through B.C. Vital Statistics.

The majority of these **244** deaths (76 per cent) occurred in 2006, as outlined in Table 1.

The 244 deaths do not represent all child deaths that occurred in B.C. in 2006. Although the CDRU monitors all child deaths as they occur, a detailed case review only takes place after the coroner's investigation is complete. Open cases involving the death of a child in 2006 may still be under investigation and therefore have not been included in this report. This element of the CDRU review process can lead to discrepancies between the statistical findings of the BC Coroners Service and those of the CDRU.

For the purposes of this report, the 63 coroner cases reviewed by the CDRU were organized by the manner in which the child died. The classification (or manner) of death was determined by the investigating coroner. The five classifications of sudden and unexpected death are Accidental, Homicide, Natural, Suicide and Undetermined.

Year of Death	Number of coroner cases reviewed	Number of natural expected deaths reviewed	Total number of cases reviewed
2003	1	0	1
2004	22	0	22
2005	34*	1	35
2006	6	180	186
Total Cases	63	181	244

Table 1. Number of child deaths reviewed by year

* In two historical cases, the children's deaths were determined to have occurred in 1985. The children's remains were located and their deaths subsequently reported to the coroner in 2005

2 | Definitions

The following definitions correspond to terms used frequently throughout the report:

Manners (Classifications) of Death

Accidental: Death due to unintentional or unexpected injury. This 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: A sudden and unexpected 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.

Age Classifications

Neonate: birth to 28 days old

Infant: 29 days to 365 days old

Preschooler: 366 days to 4 years old

Child: 5 years to 12 years old

Youth: 13 years to 18 years old

Unintentional vs. Intentional Injuries

Injuries are categorized by one of the following:

Unintentional injuries: Unintended damage to the body as a result of an unplanned incident such as vehicular incidents, drowning and fires.

Intentional injuries: Intended damage to the body as a result of a planned incident such as a suicide or a homicide.

Natural Deaths

Natural Expected deaths are categorized as one of the following:

Non-coroner Case (NCC): Cases reported to the coroner that, after an initial investigation, are determined to be Natural deaths consistent with the medical history and circumstances. These cases do not meet the criteria for death reporting outlined in Section 9 of the former Coroners Act.

Natural-Expected: An expected death primarily resulting from a disease of the body and not resulting secondarily from injuries or abnormal environmental factors.

Undetermined Deaths: SIDS vs SUDI

Sudden Infant Death Syndrome (SIDS): the sudden unexpected death of an infant under one year of age which remains unexplained after a thorough investigation including review of the clinical history, examination of the death scene, and a complete autopsy. SIDS is a diagnosis of exclusion; there are no pathological markers that distinguish SIDS from other causes of sudden infant death.

Sudden Unexpected Death in Infancy (SUDI): a classification used by the BC Coroners Service since 2004 to distinguish cases of infant deaths which have a SIDS-like presentation, but also have recognized risk factors present. Risk factors may include sleeping on stomach (prone) or side, soft sleep surfaces, overheating, exposure to smoke and bed-sharing.

Ministry of Children and Family Development (MCFD) Terms

Child in care: a child who is in the custody, care or guardianship of a director or the director of adoption.

Special Needs Agreement: a written agreement between the director and a parent who has custody of a child with special needs. The agreement is used to address or meet the child's need for security, stability and continuity of lifelong relationships.

Voluntary Care Agreement: a written agreement between the director and a parent who has custody of a child and is temporarily unable to look after the child in the home.

Continuing Custody Order: an order placing a child in the care of the director permanently until either the child reaches 19 years of age, or is adopted or married. A continuing custody order can also be cancelled by the court. In some cases, the custody of the child may be transferred under section 54.1 of the Child and Family Service Act.

BCCS Regions

Fraser Region: includes Burnaby to the Coquihalla Highway Toll Booth, 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 borders, and the Queen Charlotte Islands.

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



3 | Risk Factors and Preventability

In the final stages of the review process, members of the CDRU assess the various risk and protective factors which were present in the child’s life and determine at what level the child’s death may be considered preventable. This helps the CDRU to identify where prevention efforts can best be targeted to have maximal impact on the health and safety of B.C. children.

Risk factors consist of behavioural, social, environmental, economic or developmental factors which may have placed the child at increased susceptibility to injury, illness or disease. Definitions and examples of the different groups of risk factors used by the CDRU are provided in Table 2.

Protective factors refer to individual, environmental, social or cultural influences that may protect the individual, group, or community from certain injury or illness. For example, protective factors for suicide may include family cohesion, academic achievement, sense of belonging and self-motivation.

Risk Factors	Definition	Example
Behavioural	An individual’s lifestyle and actions/reactions to other people and events	Driving while impaired
Social	An individual’s social network (family, peers, community) and culture	Family discord or breakdown of a relationship
Environmental	An individual’s surrounding that is generally out of the individual’s control	Access to a firearm
Economic	An individual’s economic status	Lack of access to proper nutrition
Developmental	An individual’s level of physical and mental maturity	Inability to turn head due to young age

Table 2. Types of risk factors

A preventable death is one in which, with retrospective analysis, it is determined that a reasonable intervention may have prevented the death at the primary, secondary or tertiary level (refer to Table 3). This framework is based on Haddon’s Matrix, which was originally developed as a tool for understanding the origins of injury and has been adapted by the CDRU to consider preventability of all classifications of death.

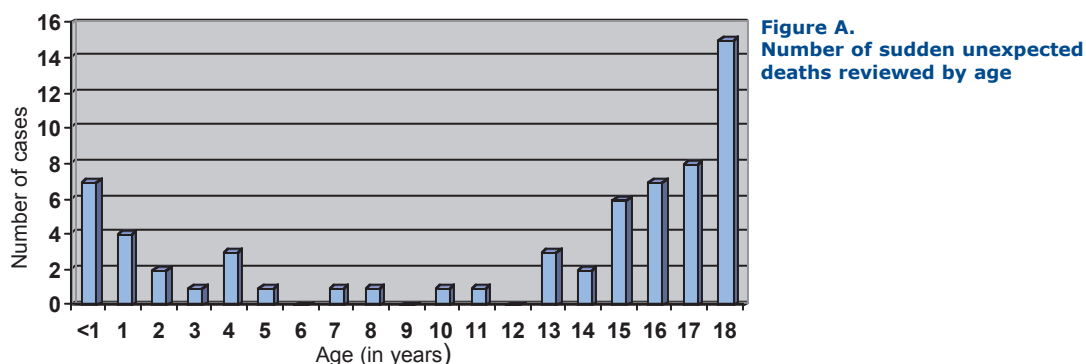
Primary (pre-event)	Opportunity for prevention before the event occurred.	If there had been a 1.2m high isolation fence around the pool, the child may not have fallen in
Secondary (event)	Opportunity for prevention as the event was occurring.	If the child had been wearing a personal flotation device (PFD) on the boat, she may not have drowned
Tertiary (post-event)	Opportunity for prevention after the event occurred.	The child may have recovered from hypothermia if re-warming treatment was provided in hospital

Table 3. Levels of prevention

4 | Summary of Coroner Cases Reviewed: 63 Children

Who were the Children?

- The age distribution of the 63 children who died of sudden unexpected causes is provided in Figure A. Youth represented the highest percentage of sudden unexpected deaths, accounting for forty-one (65 per cent) deaths.
- Sudden unexpected deaths were more frequent among males, who accounted for two thirds (67 per cent) of the children. The remaining 21 children were female.
- Male youths were the most vulnerable group among cases of sudden unexpected deaths, comprising a total of 30 (48 per cent) children.



- Fifty-eight (92 per cent) of the children lived in B.C. Five (8 per cent) of the children permanently resided outside of the province and were visiting B.C. on a temporary basis at the time of their death.
- Forty-six (73 per cent) of the children lived in a two parent household and 11 (17 per cent) were part of a single parent family. Five children resided with extended family, friends or partners. The child's family situation in the remaining case was unknown.
- Twenty-three children (37 per cent) had known illnesses or disabilities. Six children had a chronic illness and five had a mental disorder.
- Ten (16 per cent) of the children lived with a physical or developmental disability and two children were identified as having learning disabilities.
- Fifteen (24 per cent) children were Aboriginal; four of whom lived on reserve.
- Eleven (17 per cent) children were known to the Ministry of Children and Family Development.

Where did their deaths occur?

- The North region had the highest number of child deaths, as outlined in Table 4.
- The majority of deaths in the North region were classified as accidental, over half of which were the result of a vehicular incident. Table 5 outlines the classifications of death relative to each region. As indicated, the North region also had the greatest number of youth suicides.
- Natural deaths were more frequent in the Vancouver Metro region. This is likely due to the location of B.C. Children's Hospital (BCCH) in Vancouver, where many children who require critical care are transported for treatment purposes.

Region	Number (%) of coroner cases reviewed
Northern	18 (29%)
Vancouver Metro	15 (24%)
Fraser	14 (22%)
Interior	13 (20%)
Island	3 (5%)
TOTAL	63

Table 4. Number of sudden, unexpected child deaths reviewed by region

	Accidental	Natural	Homicide	Suicide	Undetermined	TOTAL
Northern	8	3	0	6	1	18
Fraser	4	4	0	4	2	14
Metro	7	6	0	2	0	15
Interior	7	0	2	3	1	13
Island	2	0	0	0	1	3
TOTAL	28	13	2	15	5	63

Table 5. Number of sudden unexpected child deaths reviewed relative to manner of death and region

How did the children die?

Accidental death was the most common manner of death among reviewed cases, accounting for 28 (44 per cent) of the 63 coroner cases (see Table 6). Fifteen (24 per cent) children died of suicide, which was the second leading manner of death.

Classifications of death can be broken down further to consider different circumstances of death which were present among reviewed cases, as outlined in Figure B.

- Vehicular incidents were the most frequent circumstance, accounting for 19 (30 per cent) of the 63 sudden and unexpected deaths.
- Leading circumstances of death varied with gender. Vehicular incidents were the most prevalent for males, who outnumbered females in the total number of vehicular incidents by almost four times. Medical circumstances of death were the most frequent for females.
- Hanging was the third leading circumstance of death, which coincides with the high number of suicides reviewed by the CDRU. Hanging was the most frequent method of suicide and occurred in nine (24 per cent) of the 15 suicide deaths.

Manner of death	Number (%) of coroner cases reviewed
Accident	28 (44%)
Suicide	15 (24%)
Natural	13 (21%)
Undetermined	5 (8%)
Homicide	2 (3%)
TOTAL	63

Table 6. Number of sudden unexpected child deaths reviewed by manner of death

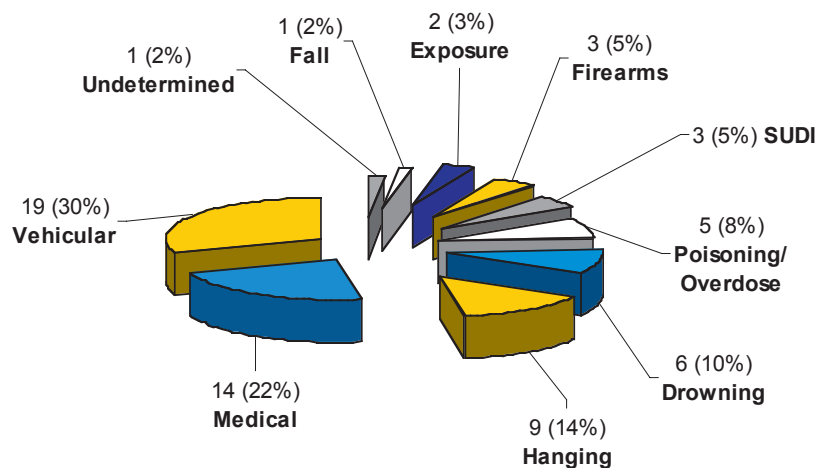


Figure B. Number of sudden unexpected child deaths reviewed by circumstance of death

What risks did the children face?

A number of risk factors were present for the 63 children who died in sudden and unexpected circumstances. As outlined in Figure C, social, behavioural and medical risk factors were the most frequent for the children. Behavioural factors were separated into two sub-categories to independently address the child's behaviour and that of other individuals. The risk factors identified do not necessarily represent all that may have been present in the child's life and/or death.

Protective factors were identified in a small number of cases and generally involved environmental or social influences. Protective factors, when documented, were consistently outnumbered by the risk factors present.

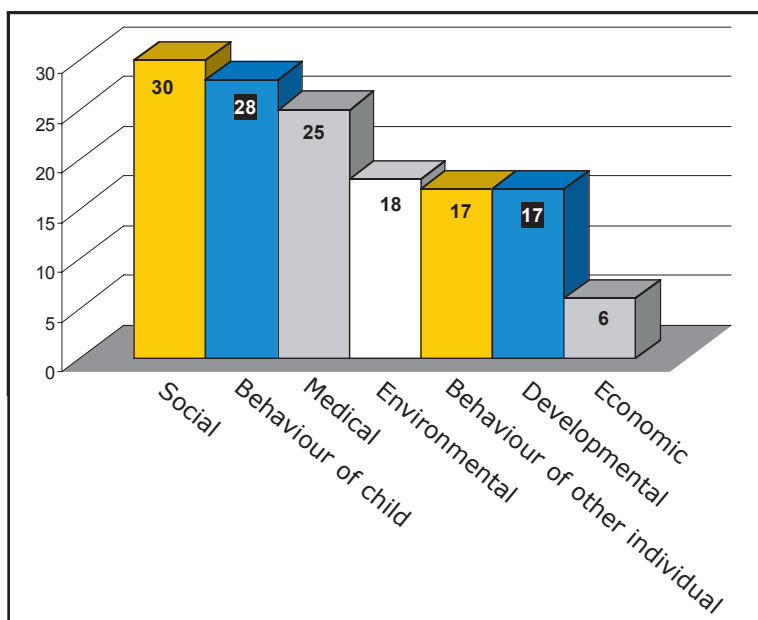


Figure C. Risk factors identified in case of sudden unexpected death
(Note: numbers do not equal 63 as many cases had more than one risk factor)

Were their deaths preventable?

Following an in-depth review of the 63 coroner cases, 48 (76 per cent) of the deaths were determined to be preventable. The majority of sudden and unexpected child deaths were preventable at the primary level.

Four of the deaths lacked sufficient information to determine preventability.

Eleven of the child deaths were determined to be “not preventable”. Of these eleven, ten were classified as natural deaths and one was undetermined.

5 | Summary of Natural Expected Deaths Reviewed: 181 Children

Of the 244 cases reviewed by the CDRU in 2006, 181 were classified as natural expected deaths. Thirty-six of these were non-coroners cases and 145 were cases reported to the CDRU through Vital Statistics.

Who were the children?

- The majority of natural expected deaths involved neonates whose deaths were the result of conditions arising out of the perinatal period;
- Ninety-five (52 per cent) were female and 86 (48 per cent) were male;
- The children came from communities throughout the province, however the majority were from the Vancouver Metro and Fraser regions;
- Twelve (7 per cent) of the 181 children were identified as Aboriginal; and
- Forty-four (24 per cent) of the 181 children were known to MCFD. The majority of these children were involved with Community Living BC (CLBC).

How did the children die?

Natural deaths were coded into classifications in order to aid in identifying statistical trends and to standardize data collection and retrieval. This allows for quick and easy comparison of data within the database, or with databases from other national or international jurisdictions.

CDRU uses a template of 8 standard classifications, based on the model from the American Centre for Disease Control (CDC)¹. These classifications are described below, including an example for each. Conditions arising during the perinatal period were the most frequent cause of death for children who died under natural expected circumstances. This was followed by children who had congenital and chromosomal anomalies or neoplasms.

Cardiovascular: Death from conditions that arise from the circulatory system (heart and blood vessels), or cardiovascular complications from another medical problem. *Example: Congestive heart failure.*

Central Nervous system: Death from conditions that arise from the brain or nervous system, or neurological complications from another medical problem. *Example: Meningitis*

Congenital and chromosomal: Death that arises from a genetic condition or one that is present at birth. This classification “trumps” a perinatal classification, in that if a neonate dies within the perinatal period of a condition that is attributable to a congenital or chromosomal anomaly, it would be classified as congenital/chromosomal rather than perinatal. In older children, there may be an underlying congenital or chromosomal anomaly, yet death may be attributable to another circumstance, such as an infection. *Example: Trisomy 18 or Microcephaly.*

Metabolic, endocrine or nutritional: Death that arises from an inborn error in metabolism, from a problem with the endocrine system (including pineal gland, pituitary, thymus, adrenals, pancreas and ovaries/testes) or from complications related to digestive or nutritional issues. *Example: Diabetic Ketoacidosis (coma)*

Neoplasm: Death that arises from a cancerous process. *Example: Leukemia.*

Conditions arising out of the perinatal period: Death that occurs within the period from the 20th week of gestation (pregnancy) to the 28th day of life. This classification also encompasses infections (sepsis) that occur within this time period. *Example: Extreme prematurity.*

Respiratory: Death that arises from conditions that arise from the respiratory system (airways and lungs), or respiratory complications from another medical problem. *Example: Pneumonia.*

Sepsis: Death that arises out of an infectious process, and that is systemic in nature. That is, it encompasses an overwhelming body-wide reaction to the infection. *Example: Necrotizing fasciitis (flesh-eating disease)*

What risks were the children facing?

The 181 children who died of natural expected causes were faced with significant medical risk factors. Children who had critical medical conditions such as congenital disorders or cancer were more frequent among cases of natural expected death. These deaths often occurred despite the best possible family and medical care.

Detailed information pertaining to the circumstances in a child's life is often limited in the cases of natural expected deaths reviewed by the CDRU. Although medical risk factors could be identified, additional data on factors outside the health care system which may have impacted health outcomes for the children were not available during the review process. This includes determinants such as income, education, social support networks, genetic endowment and social and physical environments. Lack of information on these determinants and their interactions in a child's life and death create a significant challenge to determining preventability of natural expected deaths.

Improved data collection on the underlying factors which are known to influence health outcomes will enhance the CDRU's ability to comment on risk factors and preventability in the future.

Part 3

Unintentional Injuries

1 | Overview

Accidents were the most common manner of sudden unexpected death, accounting for 44 per cent of coroner cases. The majority of these deaths were vehicular in nature, as outlined in Figure D. These findings are consistent with national statistics which indicate that unintentional injuries are a leading cause of death in children throughout the country. Although the proportion of fatal unintentional injuries remains high, national trends show a decrease in child deaths resulting from unintentional injury over a ten year period.² This trend suggests that prevention initiatives at the local, provincial and national levels are having an impact.

A review of the 28 child deaths due to unintentional injuries found:

- Unintentional injuries were the most frequent among youth, who represented a total of 21 cases of accidental death. Age distribution for the remaining cases included one child, five preschoolers and one infant;
- Twenty-two (79 per cent) of the children were male. Males outnumbered females in all types of accidental deaths with the exception of accidental poisonings. This disparity in gender is reflected in national statistics that identify males as being at higher risk of unintentional injury;
- Aboriginal children accounted for six (21 per cent) of the 28 accidental deaths. This is consistent with previous findings of the CDRU; and

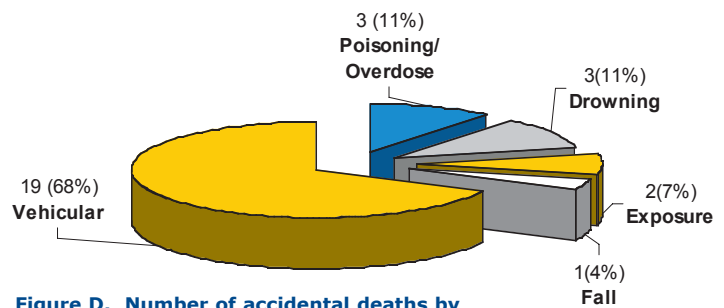


Figure D. Number of accidental deaths by circumstance

- Children known to MCFD accounted for four (14 per cent) accidental deaths. This represents a five per cent decrease in the number of such cases reviewed for the CDRU 2005 Annual Report.³

Location of injury	Number of cases reviewed
Roadway	17
Home (of child or relative/friend)	15
Railway/Railyard	2
Ski resort	1
Other public space	3
TOTAL	28

Table 7. Location of unintentional injury events

Where did the event occur?

Seventeen (61 per cent) of the unintentional injury events took place on roadways, which is a reflection of the high percentage of vehicular incidents that were referred to the CDRU (refer to Table 7). The second leading location of injury was at the child's home, or that of a relative or friend. Three of the five injury deaths that occurred in the child's home were drownings, which took place in a body of water on the property.

Who is at risk?

Unintentional injury deaths were the most prevalent for male youths, who comprised 64 per cent of the cases of accidental death reviewed by the CDRU. Generally, youths are more likely to engage in high risk behaviours and have increased independence from caregivers than younger age groups. Studies suggest that male children are at higher risk for unintentional injury due to differences in how they are socialized with respect to risk-taking, in addition to being more impulsive and active.⁴

Were their deaths preventable?

All accidental deaths reviewed by the CDRU were determined to be preventable at the primary level. Ten (36 per cent) deaths were also identified as preventable at the secondary level, through the implementation of safety measures and/or enhanced emergency response during the injury event. Although opportunities for tertiary prevention are often limited when considering fatal injuries, two deaths were determined to be preventable at the primary, secondary and tertiary levels.

The following sections provide in-depth analysis of the 28 accidental deaths reviewed by the CDRU, organized by circumstance of death.

2 | Vehicular Incidents

Nineteen (30 per cent) of the 63 sudden unexpected deaths were due to a vehicular incident, accounting for more deaths than any other circumstance. This trend is consistent with the findings in the CDRU 2005 Annual Report.⁵ Vehicular incidents are the leading cause of death for young people in Canada and throughout the world.^{6,7}

A review of the 19 vehicular deaths resulted in the following findings:

Who were the children?

- Fifteen of the children (79 per cent) were male; four (21 per cent) were female;
- The children ranged in age from 4 months to 18 years of age. The deaths involved one infant, two preschoolers, one child and 15 youths;
- Two (10 per cent) of the children were Aboriginal; one lived on reserve; and
- Two (10 per cent) of the children were known to MCFD.

Where did the incident occur?

- The highest number of vehicular deaths occurred in the Interior region, which reported six cases. The North, Fraser and Vancouver Metro regions each reported four deaths, and the remaining case occurred in the Island region. The Interior region had the highest number of total vehicular deaths in the province between 1997 and 2004⁸; and
- Vehicular incidents occurred more frequently on residential streets, which was the case in seven of the deaths. Five incidents took place on a highway and five on a rural road. Of the remaining two incidents, one occurred on a dock and the other in a railway area.

Key Findings

- **Vehicular incidents were the leading circumstance of sudden unexpected death.** Thirty per cent of coroner cases were the result of a vehicular incident, accounting for more deaths than any other circumstance.
- **Vehicular incidents were more prevalent among male youths.** Vehicular incidents were three and a half times more frequent for male youth than females from all age groups combined. In over half of the incidents, a male youth was the driver of the vehicle.
- **Unsafe speed was the leading contributory factor in vehicular incidents.** Nearly half of all vehicular deaths reviewed involved unsafe speed. Novice drivers were more likely to be involved in a fatal incident where speed was identified as a contributory factor.

How did the children die?

- Forty-seven per cent of the children were involved in single motor vehicle incidents, which were more frequent than multiple motor vehicle crashes (32 per cent of the cases). Sixteen per cent of the children were pedestrians and five per cent were cycling at the time of their injury;
- Driver error was a factor in 13 (68 per cent) vehicular incidents. Seven of these incidents were the result of a driver failing to react to a traffic signal. Five were the result of a driver failing to negotiate a turn or an intersection. In one incident the driver swerved into oncoming traffic on a straight section of roadway; and
- The majority of children died as a result of blunt force injuries. Two children drowned subsequent to a vehicular incident. In one case, the cause of death was strangulation by a seatbelt.

In **16** (84 per cent) of the 19 cases, the child was on or inside the vehicle at the time of their injury. A review of these cases found:

- The majority of incidents involved pickup trucks, as identified in Table 8. Children in pickup trucks were less likely to use a restraint than children in other vehicles;
- The deaths of two motorcyclists and one All Terrain Vehicle (ATV) operator were reviewed, all involving male youth. Unsafe speed was a risk factor in two cases, the remaining incident involved an obstruction on a private rural road;
- One incident involved a collision between a youth cyclist and motor vehicle. Inattention and lack of helmet use on the part of the youth were factors in this death;
- Eight (50 per cent) of the children who died were operating the vehicle at the time of the incident (see Figure E), all of whom were male youths. Five children were passengers; two were females in vehicles driven by an adult family member and the remaining three were male youths in vehicles driven by a peer;
- Five (31 per cent) of the children were in vehicles with one or more youth passengers; and
- One child was moving around in the vehicle while it was stationary and accidentally put the vehicle into gear.

Type of vehicle	Number of vehicular incidents reviewed
Pickup truck	6
Car	5
Motorcycle	2
ATV	1
Van	1
Bicycle	1
TOTAL	16

Table 8. Number of vehicular incidents reviewed by type of vehicle

For young drivers, the risk of being in a fatal vehicular incident increases with the number of passengers. This risk is amplified if the passengers are males under 30 years of age.⁹

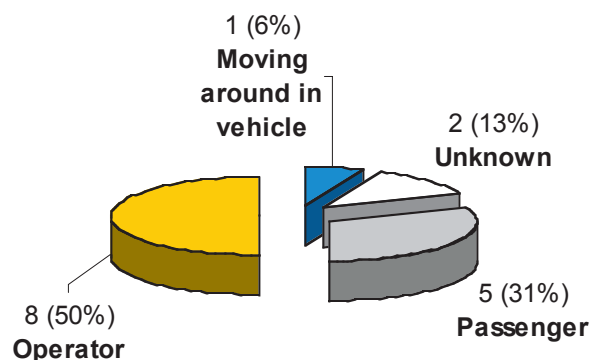


Figure E. Position of child in vehicle at time of incident.

In B.C. a license is not required to operate an ATV. With the advent of new technology allowing for the distribution of larger, heavier and faster vehicles there has been an increase in the number of injuries and fatalities related to recreational ATV use.

The Canadian Institute for Health Information (CIHI) recently reported an 18 per cent increase in ATV related injuries over less than ten years for males aged 15-19 years.

Driver inexperience, combined with the new breed of larger, faster machines, has been found to be a contributory factor in the increasing number of serious injuries and deaths of children and youth across North America.¹⁴

A Note on Motorcycles and ATVs . . .

Motorcycles and ATVs are powerful machines that can attain high speeds. Unlike cars and other enclosed passenger vehicles, they provide little protection to the rider in the event of a crash. According to the National Highway and Traffic Administration (NHTSA), motorcyclists are 26 times more likely to die in a crash than someone riding in a passenger car.¹⁰ Youth often lack the physical strength, coordination and driving experience that are necessary to operate these vehicles safely. Nationwide, youth account for 11 per cent of motorcycle fatalities.¹¹ Children and youth account for almost 25 per cent of ATV-related deaths each year.¹²

Currently, B.C. and the Yukon are the only jurisdictions in Canada which lack legislation and regulations restricting ATV usage by children and youth. Nova Scotia for example, implemented regulations under the Off-Highway Vehicles Act (2006) that set minimum age requirements and control the size of the vehicle permitted to be used based on the age and in the weight of the child. Furthermore, children using ATVs and their legal guardians must pass a training course. Safe Kids Canada reports that only one year after the law came into effect, there was a 50 percent reduction in ATV-related injuries for youth under 14.¹³

In **three** (16 per cent) of the 19 vehicular deaths, the children were pedestrians and were therefore outside of the vehicle at the time of their injury. A review of these deaths determined the following:

- Two pedestrians were killed in a single incident involving the same vehicle;
- All occurred on residential streets in urban or semi-urban areas; and
- Inattention on the part of the driver or the child and wet and/or dark road conditions were present in all three incidents.

What risks did the children face?

Unsafe Speed

Unsafe speed, defined as driving too fast for road and traffic conditions, was a risk factor in eight (42 per cent) vehicular deaths and more frequent in single vehicle crashes. In over half of these deaths, the driver had little or no driving experience. Unsafe speed was particularly frequent in cases where a male youth was operating the vehicle, of which 64 per cent were driving too fast for road and traffic conditions.

North American statistics show that drivers between 16 and 19 years of age are almost twice as likely to be involved in a fatal accident where unsafe speed is involved when compared to drivers between 20 and 49 years of age.¹⁵ A recent study indicates that males, especially those who are inexperienced drivers, are more likely to act impulsively while driving.¹⁶ Impulsivity is linked to high risk behaviours such as speeding and aggressive driving.

Environmental Factors

Environmental risk factors were present in six (32 per cent) of all vehicular incidents. This included wet road conditions and lack of visibility due to heavy rain, which were factors in three incidents. Mechanical issues were present in two incidents, including malfunctioning of an emergency brake and a faulty trailer hitch that became detached. An obstruction on the roadway was a risk factor in one incident.

In addition to poor weather conditions, environmental risks can also include modifiable factors such as road design, traffic signals and signage. Transport Canada reports that enhanced road structure, design and maintenance are preventative strategies to reduce fatal motor vehicle incidents, including those that involve pedestrians.¹⁷ Environmental modifications which promote pedestrian safety include countdown signals, pedestrian islands, cyclist pathways and shoulder widening.¹⁸

Drug and/or Alcohol Impaired Driving

Drug and/or alcohol impairment was a risk factor in three (16 per cent) of the vehicular deaths reviewed, and often occurred in conjunction with speed and driver error. In one of the deaths, the child was a passenger in a vehicle driven by a parent who was determined to be drug-impaired. The second death involved a male youth who was driving a stolen vehicle; this child had blood alcohol levels above the legal limit and was also drug impaired. Alcohol intoxication was a risk factor in the third death, which involved a female Aboriginal youth who was driving with three other youths at the time of the incident. It was unclear who was driving the vehicle at the time of the crash.

It was unknown if alcohol and/or drug impairment was a risk factor in nine vehicular deaths reviewed by the CDRU. The identification of alcohol or drug use as a risk factor is based on results of toxicology tests which are completed during the coroner's investigation. In cases where the child was a passenger, toxicology tests were often not completed which suggests that the extent of drug or alcohol related vehicular deaths reported may be an underestimation.

ICBC reports that in 2005, unsafe speed and alcohol were the top contributing factors for fatal crashes involving youth drivers; in the same year, 21 per cent of drivers in all alcohol-related crashes were between the ages of 16 and 21.¹⁹

What protective factors were in place?

Use of a Restraint

Restraint use was legally mandatory in 12 incidents of vehicular death. In six (50 per cent) of these cases, the children were wearing a shoulder/lap restraint that was appropriate to their age and development. Five children (42 per cent) were not wearing an appropriate restraint device at the time of their injury. These incidents included one infant and four youths. In one case it could not be determined if the child was wearing a restraint.

In Canada, youth have the lowest rate of restraint usage when compared to other age groups. Young male drivers and passengers, especially those in rural areas, are the least likely to use a restraint.²⁰ Transport Canada estimates that if all drivers and passengers always wore their seatbelt, an estimated 300 lives would be saved annually in Canada.²¹

Use of a Helmet

Helmet use is mandatory for all motorcyclists and bicyclists in B.C.,²² a regulation which applied in three cases of vehicular deaths reviewed by the CDRU. These cases involved two motorcyclists and one bicyclist, of which only the cyclist was not wearing a helmet. One of the motorcyclists was wearing an ill-fitting and improperly fastened helmet, which became displaced as a result of the incident.

ICBC reports that in 2005, five out of seven cyclists who died were not wearing a helmet. Current research suggests that helmets can prevent death in 29 per cent of crashes.²³

Graduated Licensing

In 13 incidents, a driver's license is legally required to operate the vehicle in question. Information regarding licensing was obtained in six (46 per cent) of the 13 cases, which identified two children as fully licensed. Two children were novice drivers ("N" drivers) based on the ICBC graduated licensing schedule.²⁴ In one of these two cases, the driver of the vehicle was violating the conditions set out in the novice stage by having more than one passenger in the vehicle without a designated supervisor. Two of the six children did not have a licence of any kind.

In British Columbia, as of 1998, new drivers must progress through a two-phase graduated licensing program that allows the driver to gain experience and skills in a low-risk setting. License restrictions are lifted gradually, so youth are more experienced when they get their full license. There is also a graduated licensing program for motorcyclists. In B.C., a license is not required to operate an ATV.²⁵ In its first three years, the ICBC Graduated Licensing Program reduced the new driver crash rate in B.C. by 16 per cent.²⁶

Were their deaths preventable?

All of the vehicular deaths were determined by the CDRU to be preventable.

Fifteen (79 per cent) of the vehicular deaths were preventable at the primary level. Removing risk factors such as impaired driving and unsafe speed may have prevented a significant number of vehicular incidents. Graduated licensing is an example of a primary prevention strategy that has proven effective in reducing motor vehicle deaths in recent years. The goal of graduated licensing is to reduce those risk factors that can be controlled (i.e. the number of passengers, speed and driving at night) for young drivers who are inherently at risk due to their inexperience and their level of physical and mental development.

Four (31 per cent) deaths were preventable at both the primary and secondary levels. Secondary prevention involves increasing protective factors such as proper helmet and restraint use to decrease the severity of the injury resulting from the crash.

Recommendations:

1 | To the Ministry of Tourism, Sports and Arts

In 2006, the BC Coroners Service issued a recommendation to the Ministry of Tourism, Sports and Arts with respect to an ATV death in 2005. This recommendation counselled that "consideration be given to establishing minimum age and training standards for recreational operators of All Terrain Vehicles."

The CDRU supports the Ministry of Tourism, Sports and Arts in their ongoing initiative to review best practice guidelines for the use of off-road vehicles (ATVs, snowmobiles and dirt bikes), and recommends that the Ministry move beyond guidelines towards a regulatory framework on licensing and registration of off-road vehicles.

2 | To the Chief Coroner and Office of the Superintendent of Motor Vehicles (Ministry of Public Safety and Solicitor General)

The CDRU recommends that the viability of linking licensing of specific motorcycles to specific training and education be examined as part of the joint project currently underway.

3 | Drowning

Of the 63 coroner cases reviewed, drowning accounted for **three** child deaths. A review of these deaths resulted in the following findings:

Who were the children?

- All three children were preschoolers ranging in age from 2 to 4 years old; and
- All three children were male, reflecting Canada-wide research that shows male children are two to three times more likely to die from accidental drowning than female children.²⁷

Drowning is the second highest cause of injury-related death for children aged 2 to 4 years old, closely following motor vehicle crashes.²⁸

Where did the event occur?

- Two drowning incidents occurred in B.C.; one in the Fraser region and one in the North region. The third drowning occurred in a rural area of Alberta close to the provincial border. This child was brought to B.C. for medical attention and later died in hospital;
- All of the drowning incidents occurred in artificial bodies of water on the child's property.
- Two children drowned in septic lagoons. The depth was unknown in both cases; and
- One child drowned in a landscape pond. The water in the pond was approximately one metre deep.

Preschoolers are more likely to drown in artificial bodies of water such as swimming pools and landscape ponds whereas older children are more likely to drown in natural bodies of water such as lakes, oceans and rivers.²⁹

How did the children die?

- The children were under the supervision of a family member in all three cases of drowning. Two were parents and one was an older sibling;
- In all three incidents, the child entered the water unattended and the supervisor was not aware the child was near a body of water when the event occurred; and
- Two children were last seen playing outside. One child was last seen inside the family residence.

What risks were the children facing?

Lapse in Active Supervision

A lapse in active supervision, resulting when the child's supervisor was reportedly distracted, was a critical risk factor in all of the cases of unintentional drowning. In each incident, the family member responsible for supervision estimated the child was out of sight for 15 to 20 minutes prior to being found in the water.

Active supervision involves staying within sight and reach of the child at all times. A child can drown in less than ten seconds so even a temporary lapse in supervision can significantly increase a child's risk of drowning. A review of child drowning deaths by the Washington State Department of Health found that 68 per cent of the drowning deaths in 2005 were the result of "inadequate supervision".³⁰

Key Findings

- **Drowning was more frequent among males.** All drowning deaths reviewed for this report involved male children. A previous review of drowning deaths referred to the CDRU between 2003 and 2006 found that male youth and male preschoolers are the top two high-risk groups for drowning.
- **A lapse in active supervision was a leading risk factor in drowning.** None of the three children were actively supervised at the time they entered the water.

Swimming Ability and Development

Given that all cases of unintentional drowning involved preschoolers, the children's level of development placed them at increased risk of injury. Children under 5 years old lack the physical and mental development to deal with an unexpected water immersion, regardless of their swimming ability.³¹ A child in this age group, even if perceived to be a "good swimmer", should be actively supervised if there is water nearby.

What protective factors were in place?

Restricted access to water

Four-sided fencing was in place in one drowning incident, which occurred in a septic lagoon. No gate system was in place in this case and it was unknown how the child gained access to the water. Fencing or other barriers were not in place in the remaining two cases.

Restricting a child's access to water (with four-sided fencing or grating) can be an effective tool in drowning prevention. Researchers estimate that proper fencing could prevent the majority of child drowning in private pools for children under 5 years old.³² Safe Kids Canada recommends that pools have four-sided fencing that is at least 1.2 metres high, equipped with self-closing and self-latching gates and designed to prevent a child from climbing or squeezing through it.³³ Creating barriers is an important level of drowning prevention but should not be used as a substitute for active supervision.

Were their deaths preventable?

The drowning deaths of the three children were determined, in all likelihood, to be preventable at both the primary and secondary levels. Primary prevention is linked to environmental factors and involves restricting a child's access to water through fencing and other barriers. Primary measures also include the modification of social attitudes and conventions related to active supervision. Secondary prevention refers to effective first aid and emergency response, should an incident occur. A recent poll by Safe Kids Canada demonstrated that only 39 per cent of parents actively supervise while 11 per cent believe that checking children every ten minutes is adequate supervision.³⁴ Current studies suggest that children should always be actively supervised, both in and around water, as even a short lapse in supervision can put a child at risk for drowning.

4 | Poisoning

Of the 63 coroner cases reviewed, **three** were unintentional poisonings. A review of the **three** deaths determined the following:

Who were the children?

- Two of the children were females and one was male;
- All three were youths between the ages of 13 and 17 years old;
- Two of the youths were Aboriginal, one of whom lived on reserve; and
- One youth was known to MCFD.

Where did the event occur?

- The Vancouver Metro, North and Island regions each reported one death due to unintentional poisoning. The death that occurred in the Vancouver Metro region involved a child visiting from the United States; and
- Two incidents took place at the home of a family member and the third incident occurred in a rail yard.

How did the children die?

- In one case, the youth unintentionally ingested methadone which had been prescribed to a family member;
- Two separate cases involved youths who ingested a lethal amount of ethyl alcohol. Both youths had blood alcohol levels above the minimum lethal limit of 400mg/dL or 0.35 per cent;
- The youths who died as a result of acute alcohol intoxication were known to be drinking alcohol with their peers in the hours prior to their death; and
- In one case, the youth was known to be heavily intoxicated and incoherent prior to death. Emergency medical treatment was not obtained for this child.

What risks did the children face?

Substance Abuse- Identification and Treatment

The children who died as a consequence of acute alcohol toxicity were known to have previously engaged in binge drinking. One youth had a three year history of alcohol use and had been hospitalized for acute alcohol toxicity on seven separate occasions. The second youth was noted to have been binge drinking “excessively” in the months prior to death. Although their patterns of alcohol misuse were known within their social networks, neither of these children had had any documented substance abuse treatment or intervention. Both of the children who died as a result of unintentional alcohol poisoning were Aboriginal; unique risk factors effecting Aboriginal children are discussed in detail in Part 8.

Binge drinking is frequently defined as consuming more than five alcoholic drinks in a short period of time. A survey of B.C. high-school students conducted in 2003 found that 46 per cent of males and 43 per cent of females reported binge drinking within the last month.³⁵ There is evidence that rates of binge drinking in Canada have risen among high school and university students through the past decade.³⁶

Storage of Prescription Medications

The third case of unintentional poisoning involved a youth who died as a result of an overdose of prescribed methadone. This youth was not aware that drugs had been ingested as the methadone was mixed with juice and placed unmarked in the refrigerator.

Key Finding

Children who died of alcohol poisoning were known to be binge-drinking during the months or years prior to their death.

Although the children’s patterns of alcohol misuse were known within their social networks and communities, treatment for substance misuse was not provided.

According to Health Canada, methadone must be labelled with a warning to the effect that ingestion could cause serious harm and toxicity if taken by someone other than for whom it was prescribed.³⁷ It is recommended that methadone be stored in the original, child-proof container supplied by the pharmacy and kept in a locked box.³⁸

Were their deaths preventable?

All unintentional poisoning deaths were determined to be preventable at the primary level. In the case involving the child who died of methadone poisoning, proper storage and identification of the medication was identified as a reasonable preventative measure. In addition to Health Canada policy, the B.C. College of Pharmacists instructs pharmacists to ensure that all patients who are permitted to take their methadone home (i.e.: a methadone ‘carry’) are informed of safe storage practices.³⁹ In this case, there was insufficient information to determine why the methadone was stored in an unsafe manner. In cases of alcohol poisoning, opportunities for primary prevention include identification and treatment of alcohol misuse and addiction issues. Effective intervention would have required the participation of the child’s community, including family, friends, police officers, teachers and medical staff.

In addition to primary prevention, two deaths due to unintentional poisoning were determined to be preventable at the secondary level. Both children experienced a prolonged period of symptoms between the time of the injury event and their subsequent death. Although symptoms were identified by family members, the severity of the child’s condition was not understood and first aid or emergency medical treatment was therefore not provided.

5 | Exposure

Of the 63 coroner cases reviewed, **two** children died as a result of exposure. A review of these deaths determined the following:

Who were the children?

- Both children were male youths;
- Both children were Aboriginal, one of whom lived on reserve; and
- One child was known to MCFD

Where did the event occur?

- The two children were from the North and Interior regions respectively; and
- One child was found in a carport of a vacant residence. The second youth was found in a shallow creek. Both of the children were found in visible public areas of the community.

How did the children die?

- In both cases the children had been drinking alcohol with friends prior to the incident. They separated from their friends in the late evening or very early morning and were last seen at that time. Both children were found the following day; and
- One child was semi-conscious when initially found and later died in hospital after attempts at resuscitation. The other child had no detectable vital signs when found.

Prolonged exposure to cold temperatures can lead to hypothermia.

Hypothermia is defined as a decrease in the core body temperature that impairs normal muscular and cerebral functions and can result in serious injury and death. It occurs when the body loses heat faster than it is replaced. Symptoms begin when the core body temperature drops below 35.5 degrees Celsius (or 95 degrees F).

What risks did the children face?

Alcohol and Drug Use

Both cases of death due to exposure were alcohol-related. In addition to these two deaths, there have been nine exposure deaths of children reported to the BC Coroners Service between 1992 and 2004. Alcohol intoxication was identified as a contributory factor in four (44 per cent) of these deaths.

Alcohol, as well as drugs such as marijuana, can cause the body's blood vessels to dilate and remain dilated. This limits the body's ability to retain heat which can increase the risk of hypothermia. In addition, alcohol and marijuana also cause sensory impairment, which can alter an individual's awareness of the current weather conditions.⁴⁰

Key Findings

- **Youth who died due to hypothermia had used alcohol prior to their death.** Alcohol was a factor in both of the cold exposure deaths reviewed by the CDRU.
- **Emergency medical treatment was not provided to the youth following their discovery.** Although the children exhibited signs of hypothermia, first aid or emergency medical services were not provided.

Exposure to Wet Environments and Low Ambient Temperatures

The children who succumbed to exposure died between December and February when temperatures in the North and Interior regions are, on average, between -5 and 0 degrees Celsius. Both incidents occurred in the evening or early morning when daily temperatures are lowest. Furthermore, one child was wearing wet clothing and the second child was found semi-immersed in shallow water.

Children are at higher risk for developing hypothermia when exposed to very low ambient temperatures.⁴¹ The body also loses heat much more quickly when in a wet or damp environment. Exposure to wetness or dampness, when combined with low ambient temperatures, increases the risk of developing hypothermia.

Absence of Timely First Aid and Emergency Medical Treatment

Delay in providing emergency medical treatment was a factor for one of the children. The child was found semi-conscious by a community member and subsequently taken home where his vital signs worsened to a weak pulse and shallow breathing. Although attempts were made to help the child, his family understood him to be recovering from intoxication and appropriate first aid for hypothermia was therefore not provided. The child was eventually brought to the hospital for treatment when his vital signs could no longer be detected. In the second case, the child was found in a creek by police and determined to be dead when pulse or respiration could not be detected. This child did not receive any first aid or emergency medical treatment.

According to Search and Rescue BC (SARBC), individuals with severe hypothermia often have a slow, weak pulse and shallow respiration making the identification of vital signs extremely difficult. Hypothermia may also cause the individual to become very rigid. A rigid body, paired with a perceived lack of vital signs may lead the first responder to believe that the person is dead. People with moderate hypothermia may also slur their speech and stumble which can lead observers to believe they are intoxicated.⁴² Immediate medical treatment is imperative to survival after cold exposure or hypothermia. According to Search and Rescue BC, aggressive re-warming should be administered to any individual who could be hypothermic, even if they appear to be deceased.⁴³

Were their deaths preventable?

The deaths of the two children who suffered from exposure were determined, in all likelihood, to be preventable at all three levels of prevention; primary, secondary and tertiary.

With respect to primary prevention, it is reasonable to determine that the deaths of these youths were avoidable if they did not misuse alcohol the night of their injury. It is unlikely that the children would have remained in a cold and wet environment, unable to make it indoors, if they had not been intoxicated. The presence of alcohol in their systems also prevented them from retaining heat, which may have sped up the hypothermic process. During their lifetime, both children were known to have substance misuse issues that remained untreated.

An important aspect of secondary prevention of hypothermia includes timely first aid and emergency medical treatment. Hypothermia can take hours to result in death and is often reversible, especially in the initial stages. In both cases of exposure deaths, first responders to the scene did not recognize signs of hypothermia and did not begin first aid or seek immediate medical treatment for the child. Individuals who are at risk of being hypothermic as a result of prolonged exposure to cold temperatures and wet conditions should always be administered first aid and brought to an emergency medical facility, even if they appear to be intoxicated or deceased.⁴⁴

Opportunities for preventive action at the tertiary level were present in both cases of death due to exposure, as the children were not taken to a medical facility for critical care and re-warming. Hypothermia treatment guidelines emphasize that the only certain criterion for death in hypothermia is irreversibility of cardiac arrest when the patient is warmed to 35 degrees Celsius.⁴⁵ Aggressive and immediate medical treatment involving re-warming should be sought out for all cases where the individual could possibly be hypothermic.⁴⁶

Recommendations:

3 | To the Chief Coroner of B.C.

The CDRU recommends that the specific findings related to exposure deaths of Aboriginal children be provided to the Representative for Children and Youth to inform advocacy strategies for Aboriginal communities in B.C.

4 | To the British Columbia Chiefs of Police

The CDRU recommends that all law enforcement jurisdictions review current policy to ensure the inclusion of actions required when attending a scene where the victim may be hypothermic.

6 | Falls

Of the 63 coroner cases reviewed, one death was the result of an unintentional fall while downhill skiing. A review of this child's death resulted in the following findings:

Who was the child?

- The child was a male youth; and
- The child was reported to be a moderately skilled skier.

Where did the event occur?

- The child's death occurred in the Vancouver Metro region; and
- The child was injured in a terrain park at a recreational ski facility.

How did the child die?

- The child fell while attempting a ski jump at high speed;
- The child used the side of a ski jump landing as a launching point; and
- The child died due to bleeding around the heart as a result of a tear to the thoracic aorta.

What risks did the child face?

High Risk Behaviour while Skiing

A review of the child's death determined that he was skiing within a freestyle terrain park at high speeds. It is unknown whether the child was skiing in an environment appropriate to his skill level and ability. The child was not wearing a helmet.

Behaviours such as skiing at high speeds, lack of helmet use and using closed jumps and other closed areas can increase the likelihood of a child having a serious ski injury, regardless of experience and ability.⁴⁷

Was the child's death preventable?

This child's death was determined, in all likelihood, to be preventable at the primary level. Education strategies aimed at reducing high risk behaviour while using terrain parks may be a reasonable intervention in preventing fatal ski injuries.

The Smart Style Program, currently used throughout the United States and in Canada, is an example of an educational strategy that aims to reduce ski injuries in freestyle terrain parks.⁴⁸ This program, delivered to the audience in the form of an orientation video, aims to educate prospective terrain park users on how to be safe in the park. It also encompasses a terrain park rating system that lets skiers and snowboarders know what to expect in the park and what skill level is required to use the park safely. Several recreational ski areas in North America require skiers and snowboarders to watch a video and sign a waiver prior to entering a terrain park, ensuring that terrain park users have some basic knowledge of the safety guidelines.⁴⁹

Part 4

Intentional Injuries

1 | Suicide

Suicide accounted for **15** (24 per cent) of the 63 coroner cases referred to the CDRU, making it the second leading classification of death following accidental. Suicide is now the second or third leading cause of death for youth in the US, Canada, Australia, New Zealand, and many countries of Western Europe.⁵⁰

A review of the 15 suicide deaths found the following:

Who were the children?

- All of the children were youths, over half of which were 18 years old;
- Eight males and seven females died by suicide. On average, female youths were younger than males;
- Three youths were Aboriginal, all of whom were females from the North region. One youth was confirmed to live on-reserve;
- Three youths were known to MCFD Child and Family Services, one of whom was in care as a result of a Continuing Custody Order (CCO); and
- The majority of youths lived in a two-parent household with their siblings.

Of these 15, 12 (73 per cent) had made prior threats and 67 per cent had expressed thoughts of suicide. Five (33 per cent) of the children had a history of self-harming.

Key Findings

- **Suicide was the second leading manner of sudden, unexpected death.** Suicide accounted for 24 per cent of sudden, unexpected deaths referred to the CDRU in 2006, resulting in a significant increase in the number of suicide deaths referred to the Unit in previous years. In the 2005 Annual Report, suicide was reported as the fourth leading manner of sudden, unexpected death.
- **Hanging was the most frequent method of suicide.** Sixty per cent of suicide deaths were the result of hanging which was the most common circumstance of suicide death for both males and females.
- **The majority of children who died by suicide had stated their intent prior to their death.** Eighty per cent of the children who died by suicide gave some indication, usually to a peer, of their intent to die by suicide.

Where did the event occur?

- Six of the suicide deaths occurred in the North region, which experienced the highest number of suicide deaths. The Fraser, Interior and Metro regions had four, three and two deaths respectively; and
- Seven youths died at home; three in a body of water; two at a friend or relative's home; two in a wilderness area and one in a public park.

How did the children die?

- Nine (60 per cent) of the youths died by hanging, which was the most frequent mechanism of suicide among the children. These findings are congruent with the most recent provincial statistics on youth suicide that show 53 per cent of suicides were hangings.⁵¹ During recent years, the rate of suicide by hanging among 10 to 19 year olds has increased nationwide;

- Three youths died by firearm. Two youths died in a single incident of double suicide, which was a historical case from 1985 that was reported to the coroner in 2005 following the discovery of remains;
- Three suicide deaths were the result of drowning and were the consequence of an intentional jump from a height; and
- The majority of suicide deaths occurred during the school year on a weekday between noon and 4 p.m.

What risks did the children face?

Para-suicidal Behaviour

Para-suicide is defined as any self-injurious behaviour with a clear intent to cause bodily harm or death, therefore including both lethal suicide attempts and more habitual or low-lethality behaviours such as cutting and self mutilation.⁵²

Twelve (80 per cent) of the youths had previously exhibited para-suicidal behaviour, including prior threats or thoughts of suicide and self-harming behaviours. Almost half of the children who died by suicide had attempted it in the past and 80 per cent had stated their intent to a family member or friend prior to their death. In five cases, a teacher, counsellor or administrator was aware of the youth's para-suicidal behaviour at some point during the course of the school year. In two cases, a suicide risk assessment was completed by a school counsellor to determine the youth's level of risk.

The Canadian Mental Health Association reports that eight out of ten Canadians who die by suicide give some indication of their intentions prior to death.⁵³

Mental Disorders

Five (33 per cent) of the 15 children had been diagnosed with a mental disorder. Depressive disorder was a component of the diagnoses in all five cases. Seven (47 per cent) of the 15 children were recognized as having symptoms of depression but were not clinically diagnosed as such. Based on the above numbers, 12 of the 15 children (80 per cent) had previously displayed symptoms of depression.

Evidence has shown that over 90 percent of children who commit suicide have a mental disorder.⁵⁴ Major depressive disorders are a serious mental health concern and substantially increase the risk of suicide. These periods of childhood depression are characterized by one or more major depressive episodes and typically last seven to nine months. They may be manifested by feelings of sadness, hopelessness, pessimism, and self-criticism. Alcohol or substance abuse may be a concurrent problem.

Access to Firearms

There were three suicide deaths where a firearm was used, in which access to a firearm was a significant risk factor for the children. In all cases, the weapon was owned by a family member and stored unlocked in the youth's home. The ammunition used by the children was stored separately from the firearm, although also unlocked.

In 2003, firearms were the chosen method in 16 per cent of suicides deaths in Canada; the use of firearms to complete suicide was substantially more frequent among males than females.⁵⁵

Type of personal crises (both acute and cumulative)	Number and percentage of suicide deaths reviewed
Family discord	7 (47%)
Argument with parents/caregivers	7 (47%)
School problems	6 (40%)
Break-up of romantic relationship	5 (33%)
Argument with romantic partner	5 (33%)
Parental separation/divorce	5 (33%)
Death of a relative	5 (33%)
Physical abuse/assault	4 (27%)
Displacement from family	4 (27%)
Death of a peer	3 (20%)
Extensive use of computer/videogames	3 (20%)
Religious concerns	3 (20%)
Issues with the law	3 (20%)
Confusion regarding sexual orientation	2 (13%)
Sexual abuse/assault	2 (13%)
Victim of bullying	2 (13%)
Instigator of bullying	2 (13%)
Recent move or change of school	2 (13%)
Internet use issues	2 (13%)
Occupational problems	2 (13%)
Pregnancy	1 (7%)
Gang activity	1 (7%)
Emotional/verbal abuse	1 (7%)

Table 9. Acute and cumulative risk factors for suicide deaths (Note: percentages do not equal 100% as children encountered multiple risk factors)

Use of Alcohol and/or Drugs

A toxicological analysis was done in six (40 per cent) of the 15 cases of suicide, which resulted in positive tests for three children. Toxicology determined that one youth was alcohol-impaired at the time of death and two youths were drug-impaired. One of these children tested positive for cocaine and related metabolites (the by-product formed when a toxic substance is broken down by the body). The second tested positive for methamphetamines, amphetamines and related metabolites. A history of substance abuse was determined to be a risk factor for seven (47 per cent) of the 15 youths.

Suicide risk is increased by the misuse of legal (alcohol) and illicit substances as intoxication may decrease inhibitions and impair judgment. Persons who misuse these substances may also have concurrent risk factors such as depression and social or financial problems. In cases of intentional overdose, alcohol increases the lethality of some medications, making it more likely that a suicide attempt will be lethal.⁵⁶

Personal Crises

All 15 children experienced a multiplicity of acute and cumulative crises in their lifetimes. More than half of the children had experienced an acute crisis such as an argument with a parent or a romantic partner, or a break-up of a relationship in the 24 hours prior to death. Family discord, arguments with parents or caregivers and problems at school were the top three crises identified. An overview of acute and cumulative crises experienced by the children is outlined in Table 9.

What protective factors were in place?

The Centre for Suicide Prevention has identified several internal and external factors which serve as protective factors against youth suicide. Internal protective measures include factors such as a sense of belonging and self-confidence, ability to make friends, perceived connectedness to school and life skills (such as coping and decision-making).⁵⁷ Examples of external protective factors include family cohesion, good relationships with other youth and adults, academic achievement and a stable environment.⁵⁸ As demonstrated by the array of acute and cumulative crises experienced by the children, many of the above protective factors were not present in their lives. In several cases of suicide, the full extent of risk or protective factors which existed for the children was unknown.

Another important external protective factor is adequate care for substance abuse and physical or mental disorders. Further detail on mental health services provided to the children who died by suicide is provided below.

Mental Health Care

The types of mental health services which were provided to the children who died by suicide are outlined in Figure F, which shows that six (40 per cent) of the children had accessed mental health care at some point through their lifetime. In two of the suicide deaths, psychiatric assessments were completed with the child with no subsequent follow-up treatment. Close to half of the children did not receive mental health services of any kind.

Among the six children who accessed care, three were receiving mental health treatment at the time of their death. Two children received services one to two years prior to their death. In one case, the dates and duration of mental health services provided were unknown.

Five of the six children had been prescribed anti-depressants for their condition. Three of these five children were reported by a parent to be non-compliant with their medication in the months prior to their death. In one case there was insufficient information to determine if the child was or was not compliant with medication.

Prescribed medical therapy with antidepressants may have a protective influence on at-risk youth. Unfortunately non-compliance with medication therapy may impact efficacy of treatment. The Canadian Journal of Psychiatry quoted a large study that showed an inverse relation between youth actually filling their prescriptions for antidepressants and suicide rates. This suggests that antidepressant use may be a critical component of suicide prevention strategies.⁵⁹ Given the presence or absence of drugs (both prescribed and illicit) and alcohol may be a risk or protective factor for suicide, toxicological screens on youth who die by suicide yield valuable data to inform review and prevention strategies.

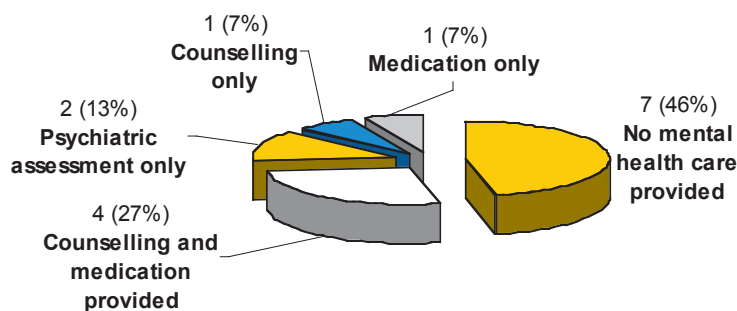


Figure F.
Mental health services provided in cases of suicide

Were their deaths preventable?

All suicide deaths were determined by the CDRU to be preventable at the primary level.

Primary prevention of suicide is multidimensional, aims to reduce risk factors while promoting accessible support services for the child, and may include all levels of the child's social sphere.

The Suicide Prevention Resource Center (SPRC) promotes Gatekeeper programs as an effective means to prevent youth suicides at the primary level.⁶⁰ Gatekeepers are individuals who have developed, through training, the critical skills to recognize, respond to, and help youth get the help they need. Gatekeepers can be students, teachers, coaches or anyone else in the community who may come in contact with youth at risk for suicide.

Gatekeeper training is a program that was developed to provide gatekeepers with:

- General knowledge about suicidal behaviour;
- Skills to recognize, respond and refer a suicidal youth for help; and
- Knowledge about how to interact with and assist suicide survivors.

Further information on best practices for suicide prevention can be obtained by visiting the Centre for Suicide Prevention (www.suicideinfo.ca) and the Suicide Prevention Resource Center (www.sprc.org).

Recommendations:

5 | To the Chief Coroner of B.C.

The CDRU recommends that coroners provide survivors of suicide with a practical guide for dealing with a suicide death, using best practice resources which are currently available from national suicide prevention agencies in the province.

6 | To the Ministry of Education

The CDRU recommends that all school districts review policies related to suicide risk assessments to ensure they include the identification and assessment of any acute crises presenting in the child's life.

7 | To the Canada Firearm Centre

The CDRU recommends the initiation of regulations that require mandatory trigger locks for all firearms at the time of purchase and further that written safe storage guidelines also be provided at point of sale.

2 | Homicide

Two (3 per cent) of the 63 sudden unexpected deaths were classified as homicide. These deaths were the result of a double murder-suicide, which was family-related. The findings related to homicide in this report correlate to those at the national level. National statistics report that a parent is the assailant in 59 per cent of homicides involving children less than 12 years of age.⁶¹ This percentage increases to 89 per cent for murder-suicides.⁶²

A review of the **two** deaths determined the following:

Who were the children?

- The children were siblings and died in the same incident of murder-suicide;
- Both children were female preschoolers and were part of a single-parent family; and
- The children were Aboriginal and did not live on reserve.

Where did the event occur?

- The incident occurred in the children's home in the Interior region.

How did the children die?

- Both children died as a result of intentional carbon monoxide poisoning in a murder-suicide completed by their parent; and
- No previous injuries were noted upon autopsy.

What risks did the children face?

During the course of the review, several risk factors associated with the parent of the children were identified. These factors included economic stressors, cultural issues, child custody and depression. Further discussion on the unique factors facing Aboriginal people is included in Part 8.

Were their deaths preventable?

The children's deaths were determined to be preventable at the primary level. Given the nature of the incident that resulted in their death, it is important to consider preventability in the context of both suicide and homicide. As stated above, a cluster of social and cultural risk factors existed for the parent and children involved. Intentional injuries and related risk factors identified within the Aboriginal population are further discussed in Part 8.

Part 5

Natural Unexpected Deaths

Thirteen (21 per cent) of the total 63 coroner cases reviewed by the CDRU were classified as natural and unexpected. A review of the **13** deaths resulted in the following findings:

Who were the children?

- The deaths of four youths, three children, three preschoolers, two infants and one neonate were reviewed;
- Seven of the children were male and six were female;
- Seven children resided in the Fraser region. Three children lived in the North region, two in the Vancouver Metro region and one in the Interior region;
- Three deaths involved Aboriginal children, none of whom were living on reserve; and
- Four children were known to MCFD. Three children were in receipt of services through Community Living BC (CLBC) and one child was known to Child and Family Services (CFS).

Key Findings

- **The majority of natural unexpected child deaths were not preventable.** Seventy-seven per cent of the natural unexpected deaths reviewed were determined, in all likelihood, to be not preventable. These deaths occurred despite the best efforts of families and medical personnel.
- **Delay in medical treatment was a risk factor for two children who died of natural unexpected cases.** The deaths of these children may have been prevented if the children had received immediate medical treatment at the onset of pronounced symptoms.

Where did the event occur?

- Five deaths occurred in Vancouver Metro region, five took place in the Fraser region and three in the North region. This distribution differs from region of residence of the children, reflecting cases in which the child was transported to B.C. Children's Hospital in Vancouver prior to their death; and
- Nine (69 per cent) deaths occurred at the child's home.

How did the children die?

- Respiratory conditions were the leading cause of natural unexpected death, accounting for a total of five deaths. Three of these children died of pneumonia. As outlined in Table 9, cardiovascular conditions were the second leading cause; and
- Six of the 13 children (46 per cent) had an acute illness in the week prior to their death. This was manifested by primarily respiratory or gastric symptoms.

Classifications	Number and percentage of natural unexpected deaths reviewed
Respiratory	5 (38%)
Cardiovascular	3 (23%)
Endocrine, Metabolic and Nutritional	3 (23%)
Neoplasm	1 (8%)
Sepsis	1 (8%)
TOTAL	13 (100%)

Table 10. Primary cause of natural unexpected death, based on CDC classification

What risks did the children face?

Medical Risks

Eight of the 13 children (54 per cent) had known health concerns, five of whom also had a superimposed acute illness. Five of the 13 children (38 per cent) had an undiagnosed health condition that resulted in their death. Three of these children had no symptoms prior to their collapse.

Children who have acute life threatening experiences are at heightened risk of natural death. Furthermore, children with long term health challenges (i.e. from genetic syndromes, cerebral palsy) may be particularly vulnerable to secondary illnesses.

Delay in Treatment

Two (15 per cent) of the 13 children who died of natural unexpected causes experienced a delay in treatment that may have contributed to their death. One of the children was symptomatic for at least 48 hours prior to his death, although medical care was not sought. The second child, an infant, had a history of respiratory issues. His parent had been instructed to bring the child in for medical care at the onset of symptoms. He was ill at home for one week, including two days of respiratory compromise before presenting at hospital. The infant was admitted and immediately transferred to Intensive Care. The infant died approximately one week later.

Were their deaths preventable?

Although 77 per cent of the natural unexpected deaths were determined to be not preventable, opportunities for secondary prevention were identified for two of the children, in consideration of significant delays in accessing medical treatment. The deaths of these children may have been prevented if the children had received immediate medical treatment at the onset of pronounced symptoms.

There was insufficient information to determine preventability in one case.

Part 6

Undetermined Deaths

Of the 63 coroner cases reviewed, **five** (8 per cent) were classified as Undetermined. Following an in-depth review, CDRU determined that two cases may not have met the criteria for the classification of Undetermined and could have been reasonably classified as Natural unexpected deaths.

A review of the **five** undetermined deaths resulted in the following findings:

Who were the children?

- Three of the deaths involved infants. The remaining children included one preschooler and one child;
- All five children were males; and
- One child was Aboriginal. It was unknown if the child lived on reserve.

Where did the event occur?

- Two deaths occurred in the Fraser region, one took place in the North, one in the Interior and one in the Island region; and
- All five of the undetermined deaths occurred within the child's home.

How did the children die?

- Three of the deaths were classified as Sudden Unexplained Death in Infancy (SUDI). A scene investigation was not documented in these cases;
- In one death, the medical cause of death was determined to be cardiovascular; and
- In the remaining case, the medical cause of death was undetermined.

What risks did the children face?

Sudden Unexpected Death in Infancy - The Triple Risk Model

Recent research has shown that some infants have an abnormality in their brainstem that may leave them vulnerable to sudden death. Although there is still much to learn regarding the aetiology of sudden infant death, a triple risk model has been developed to aid in understanding a possible series of events that puts a child at risk. The three elements of risk are comprised of the following factors: a vulnerable infant, a critical developmental period and an outside stressor (see Figure G). According to the Triple Risk Model, all three elements must come together to result in a sudden unexpected death in infancy.

Key Finding

- **The combination of medical and developmental vulnerability with exposure to an unsafe sleep environment was frequent in cases of Sudden Unexpected Death in Infancy (SUDI).** Two of the SUDI deaths reviewed involved infants who were in a vulnerable period of development and were exposed to external risks, including unsafe sleep practices.



Figure G. Triple Risk Model for Sudden Infant Deaths. Adapted from Filiano and Kinney 1994

1) Vulnerable Infant

Although the infant may appear healthy, there may be an internal underlying defect, likely in the brainstem. The brainstem controls breathing, heart rate, and other regulatory mechanisms such as thermoregulation (temperature control). There is no current method for identifying which infants are vulnerable and at risk, although research is ongoing.

2) Critical Development Period

The first six months of life is a period of rapid growth and maturation. Rapid changes occur in sleep/wake patterns, breathing, heart rate, blood pressure, and temperature regulation. Although sudden infant death can occur at any time in the first year, and occasionally beyond, it is most prevalent during the first six months.

3) Outside Stressor(s)

Environmental or outside stressors that a “normal” healthy baby might overcome without difficulty may trigger an unexpected death in a vulnerable infant, when combined with above elements. These environmental stressors may include:

- Sleeping on the stomach (prone) or side;
- Sleeping on inappropriate surfaces such as a couch, waterbed or adult bed;
- Sleeping with pillows, loose bedding, bumper pads or toys;
- Becoming overheated;
- Exposure to second hand smoke during pregnancy or at home/daycare;
- Bed-sharing with possible overlay;
- Being a preterm infant or having a low birth weight;
- Being born to a mother under 20, or who had late or no prenatal care; and
- Recent respiratory or gastrointestinal illness.

The Triple Risk Model can be used to examine the three SUDI deaths which were reviewed by the CDRU, as shown in Table 10. All of the possible external stressors may not be known for each child. As outlined, two children were in a vulnerable period of development, had external risk factors including unsafe sleep practices and died in their sleep. One child was an older infant whose sudden arrest and death while awake was witnessed by several family members.

	Vulnerable Infant	Critical Development Period	Known External Stressors
Child #1	unknown	10 months old	Gastric reflux
Child #2	unknown	2 months old	Recent viral illness, unsafe sleeping surface, bed-sharing with partial facial overlay, presence of second hand smoke.
Child #3	unknown	6 months old (born one month prematurely)	Recent viral illness, unsafe sleeping surface, bed-sharing, prone sleeping.

Table 11. Examination of SUDI deaths examined using Triple Risk Model

Medical Risks

For the remaining two undetermined cases, each child had some degree of medical risk. One of the children had a long history of recurring cough and fever of unknown origin and was in receipt of over-the-counter medication. One child was noted as “failing to thrive” for unknown reasons, and had several anomalous physical findings on autopsy.

What trends are evident?

Although new classifications differentiate between cases of SUDI and Sudden Infant Death Syndrome (SIDS), historically sudden infant deaths were placed into the single category of SIDS. In 1999, 26 per cent of all Canadian infant deaths were caused by SIDS. In the early 1990’s however, the Back to Sleep Campaign was launched, and the incidence of SIDS dropped (see Figure H).

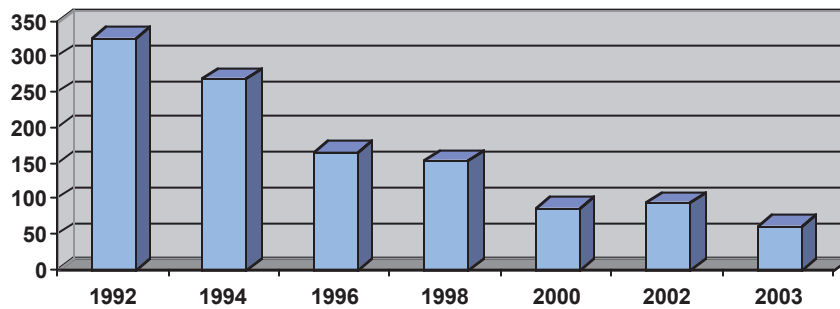


Figure H. SIDS rates in Canada, 1990 – 2003. Source: Canadian Foundation for Sudden Infant Deaths

Approximately two thirds of SIDS deaths occur in infants aged 2-4 months. Ninety percent of deaths occur in children younger than 6 months and death is rare after 1 year of age. This unique age at death profile suggests a relationship to neurobiological components of infant development (see Triple Risk Model).

SIDS rates have also dropped due to classification changes. As society gained a greater understanding of the risk factors of sudden infant death during sleep, many deaths that had historically been attributed to SIDS were now attributed to positional asphyxia or other mechanisms. The BC Coroners Service has used the designation of SUDI since November 2004, to differentiate deaths due to “classic SIDS”, which were classified as Natural, from deaths with specific risk factors that can not be excluded from causality of death. All cases of SIDS and SUDI are now classified as Undetermined.

Although the number of SUDI deaths referred to the CDRU in 2006 was low, monitoring of current infant deaths reveal a concerning number with factors arising from unsafe sleep practices. The CDRU is commencing partnerships with provincial stakeholders to address this alarming trend.

Were their deaths preventable?

Of the five undetermined deaths reviewed, one was determined in all likelihood to be preventable at the primary level. Safe sleeping practices may have been effective in preventing this death. One death was deemed to be “not preventable”. In the three remaining undetermined deaths, there was insufficient information to determine preventability.

Enhanced data collection pertaining to SUDI deaths would assist the CDRU in determining preventability of these deaths. Current best practice suggests that SUDI death investigations require:

- Thorough examination of the death scene;
- A review of the clinical history; and
- Performance of an autopsy.

If a scene investigation and recreation are not performed, opportunities for the most accurate classification and manner of death are lost. This affects database statistics and impedes preventive action and education. A scene investigation was not documented in the three SUDI deaths.

Recommendation:

8 | To the Chief Coroner of B.C.

The CDRU recommends that all written reports pertaining to child deaths that are classified as undetermined be reviewed by the child death investigation and paediatric investigation coroners prior to conclusion.

Part 7

Natural Expected Deaths

Of the 244 cases reviewed by the CDRU, **181** (74 per cent) were natural expected deaths; these include both non-coroner cases and those reported through Vital Statistics (see definition on page 8).

A review of the **181** natural expected deaths determined the following:

Who were the children?

- Nine of the children reported as natural deaths were stillborn. Stillbirths are not generally reported to the CDRU;
- Of the remaining 172 children, the majority were neonates who accounted for 96 (53 per cent) deaths. Twenty-five (14 per cent) of the children were infants, 14 (8 per cent) were preschoolers, 17 (9 per cent) were children and 20 (11 per cent) were youths;
- One hundred twenty (70 per cent) children died before reaching their first birthday. Fifty-four per cent of neonates died on their first day of life;
- Ninety-five (52 per cent) children were male and 86 (48 per cent) were female; and
- The majority of the children were from B.C. and resided in the Vancouver Metro and Fraser regions (see Table 11). In three instances the child resided outside the province, and in one case the child came from out of the country. Region of residence was not known for two children.

A child is deemed to be stillborn if it is born with no signs of life (movement, pulse, respirations) after attaining a weight of at least 500 grams and after the 20th week of pregnancy. Although final 2006 numbers are not yet available from the B.C. Vital Statistics, there were 313 stillbirths in B.C. in 2005. The B.C. Reproductive Care Program (BCRCP) reports that in 2003/2004, the highest rate of stillbirths was found in the North Region. Potential causality for this is under investigation by the BCRCP.

Where did the event occur?

The highest number of natural expected deaths occurred in the Vancouver Metro region, which reported more than four times as many deaths compared to other regions (Table 12). This is largely due to two major paediatric care centers in the province, B.C. Children's Hospital and Canuck Place hospice, which are located in the Vancouver Metro region. Almost half of the children died in the Vancouver Metro region in a hospital or hospice setting.

Region	Number and percentage of children who lived in the region	Number and percentage of children who died in the region
North	16 (9%)	10 (5%)
Interior	27 (15%)	19 (11%)
Island	21 (12%)	17 (10%)
Vancouver Metro	56 (32%)	104 (60%)
Fraser	55 (31%)	25 (14%)
TOTAL	175	175

Table 12. Number of natural expected deaths reviewed by region of residence and death.

How did the children die?

- Fatal complications that arose during the perinatal period were the most common cause of natural deaths reviewed, as shown in Figure I. Sixty-eight (38 per cent) neonate deaths fell within this group. Of these 68, 76 per cent died as a result of complications related to a premature birth; and
- Congenital and chromosomal anomalies comprised the second largest group of natural child deaths.

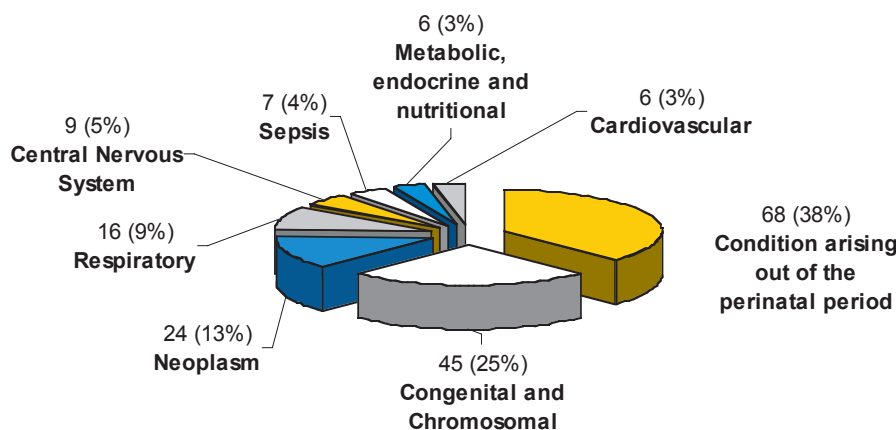


Figure I. Natural expected deaths reviewed by classification of death

What risks did the children face?

Prematurity

Seventy-six per cent of deaths due to conditions arising out of the perinatal period involved neonates who were born premature. This finding is reflective of national and provincial statistics showing that premature labour and delivery is the major cause of morbidity and mortality in reproductive care. According to Statistics Canada, the rates for preterm birth in Canada rose from 6.6 per cent in 1991 to 7.6 per cent in 2000. In B.C., there has also been a rise in preterm deliveries. Several factors associated with an increased incidence of preterm delivery include an increase in multiple births, a decrease in birth weight and maternal age.⁶³

Congenital and Chromosomal Anomalies

Congenital and chromosomal anomalies comprised the second largest group of natural child deaths. The underlying cause for most congenital anomalies is unclear. Recent estimates are that 15-25 per cent may be due to genetic conditions, 8-12 per cent may be due to environmental factors such as maternal-child conditions or exposure to chemicals or drugs and 20 per cent may be due to multifactorial inheritance. Multifactorial inheritance is a combined influence of genetic and environmental factors.⁶⁴

The Perinatal Health Report states that 2 -3 per cent of Canadian infants will be born with a serious congenital anomaly. Canadian infant mortality due to major congenital anomalies has decreased from 3.1 per 1,000 live births to 1.9 per 1,000 live births from 1981 to 1995, however major congenital anomalies remain a leading cause of death among Canadian infants. Of the 45 congenital and chromosomal anomaly deaths reported as Natural under Vital Statistics and Non-coroner Cases, 44 or 98 per cent of the deaths occurred within the first year of life. These 44 deaths comprise less than one percent of live births in the province.⁶⁵

Were their deaths preventable?

The majority of natural and expected deaths are reported through the B.C. Vital Statistics Agency. Information on these deaths is limited to what is provided on the child's registration of death, which includes demographics and cause of death with some causal/contributory factors. Data that would support the creation of case-specific prevention strategies is not currently available to the CDRU through this process.

One area that may be impacted by generalized population based strategies is infant mortality. Infant mortality rates are closely tied to gestational age at birth and birth weight. Each day of development increases system maturity and chance of survival. The BCRCP reports that up to 50 per cent of preterm births are potentially preventable. Interventions optimizing maternal health prior to and during pregnancy, as well as during labour and delivery, may positively impact infant mortality rates.⁶⁶ These interventions may include preconception care; spacing between pregnancies; maternal health during pregnancy; access to prenatal care; maternal age; maternal use of drugs or alcohol; genetic testing and fetal health.

Part 8

Aboriginal Children

1 | Overview

Aboriginal children accounted for 27 (11 per cent) of the total 244 cases referred to the CDRU in 2006. Fifteen of these deaths were sudden and unexpected (11 injury deaths, 3 natural and 1 undetermined); 12 were natural and expected. Given that Aboriginal children and youth comprise only seven per cent of the under 19 population in B.C.⁶⁷, their frequency among reviewed cases represent a disproportionate number of child fatalities in the province. This over representation becomes increasingly significant when considering that the number of identified Aboriginal children in this report is likely an underestimation. Aboriginal representation among cases of natural expected deaths was determined from information listed on the child's registration of death provided by B.C. Vital Statistics. Relying solely on the registration of death as a means of identifying Aboriginal status is known to result in an underestimation of unknown extent.

The use of the term Aboriginal in this report includes all identified First Nation, Métis and Inuit peoples.

When did their deaths occur?

This section is devoted to the 27 Aboriginal children whose deaths were referred to the CDRU in 2006. These children died between 2003 and 2006 (see Table 13). One exception was a historical case involving a female Aboriginal youth who died by suicide in 1985. Her remains were located and her death subsequently reported to the BC Coroners Service in 2005.

Year of death	Number of coroner cases reviewed	Number of natural expected deaths reviewed	Total number of cases reviewed
2003	1	0	1
2004	8	0	8
2005	6*	1	7
2006	0	11	11
Total	15	12	27

Table 13. Number of Aboriginal child deaths reviewed by year

* In one historical case, the child's death was determined to have occurred in 1985. The child's remains were located and the death subsequently reported to the coroner in 2005.

How did the children die?

Deaths were considered under three broad categories: injury (unintentional and intentional), natural (either expected or unexpected) and undetermined deaths (see Figure J). Natural expected and unexpected deaths have been clustered to allow for comprehensive analysis of all natural deaths involving Aboriginal children.

Findings related to the lives and deaths of the children identified as Aboriginal are presented in the following sections. Key findings are placed in the context of broader trends and risk factors pertaining to Aboriginal health and wellness.

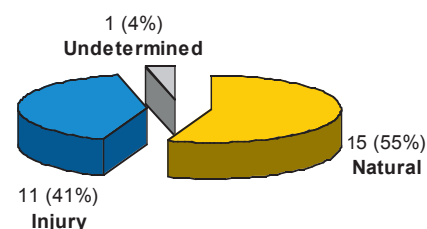


Figure J. Number of Aboriginal child deaths reviewed by circumstance

2 | Injury-related Deaths

Of the total reviewed cases referred to the CDRU in 2006, 45 were deaths due to unintentional or intentional injuries. Aboriginal children and youth represented 11 (24 per cent) of these cases. Their representation among injury fatalities is over three times greater than their representation in the general under 19 population in the province.

A review of the 11 cases of Aboriginal child death due to injury resulted in the following findings:

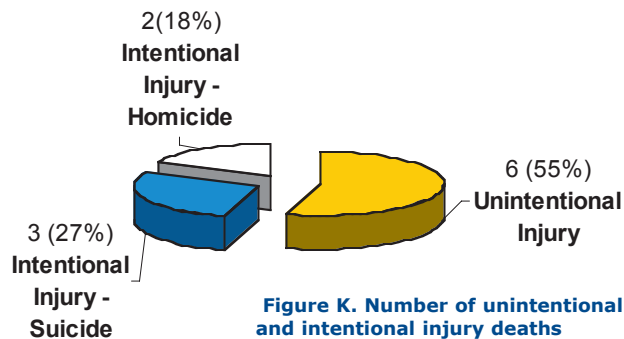


Figure K. Number of unintentional and intentional injury deaths

Who were the Children?

- Seven (64 per cent) children were female and four (36 per cent) were male;
- Youth accounted for nine (82 per cent) injury fatalities; preschoolers accounted for two (18 per cent);
- Six (55 per cent) Aboriginal children were living off-reserve at the time of their death. Four (36 per cent) were confirmed to be living on-reserve and in one case, place of residence was unknown; and
- Four (36 per cent) Aboriginal children were known to MCFD; none of the children were in care.

Region of death	Number of cases
North	7
Interior	3
Metro	0
Island	1
Fraser	0
TOTAL	11

Table 14. Injury deaths of Aboriginal children reviewed by region of death

Where did the event occur?

Seven (64 per cent) injury deaths occurred in the North region (see Table 14). This finding is consistent with previous reports issued by the CDRU, which have identified the North region as having a greater frequency of fatal injuries.

How did the children die?

- The distribution of deaths relative to unintentional and intentional circumstances of injury is shown in Table 15. The frequency of unintentional injuries was marginally higher than intentional injuries (see Figure K).
- Patterns of injury in the Aboriginal population are similar to those of the general population in B.C. although the rate of injury among the Aboriginal population is higher across several circumstances of death. Despite a substantial decrease (more than 50 per cent) in injury death rates among First Nations during the 1990⁶⁸, research shows that First Nations people continue to be more vulnerable to many types of injury in comparison to the general population in B.C.

Category and circumstance of injury	Number of cases
Unintentional (accidental)	6 (Total)
Exposure	2
Motor Vehicle Incident	2
Unintentional Poisoning	2
Intentional (suicide and homicide)	5 (Total)
Suicide: Drowning	1
Suicide: Firearm	1
Suicide: Hanging	1
Homicide: Intentional Poisoning	2
TOTAL CASES	11

Table 15. Manner and Circumstance of Injury Deaths among Aboriginal Children

Unintentional Injuries

Death due to unintentional injury comprised six (55 per cent) of the 11 injury fatalities, making it the leading cause of sudden unexpected death in Aboriginal children. Included in this category are circumstances of motor vehicle incidents, exposure and poisoning, which each accounted for two deaths.

Motor Vehicle Incidents

Both deaths that occurred as a result of a motor vehicle incident involved youths. One incident involved a female who died in a single-vehicle crash where alcohol was determined to be a contributory factor. The second youth, a male, died when his vehicle was struck by a trailer that had detached from an oncoming vehicle. No additional contributory factors were identified in this case.

Despite decreases over time, motor vehicle incidents continue to be a leading cause of death among Aboriginal people of all ages, including children and youth.⁶⁹ Factors which have been found to contribute to the incidence of motor vehicle crashes in the Aboriginal population include road conditions, the greater distance required to travel for regular activities and access to emergency care.⁷⁰ These are in addition to other behavioural risk factors which are commonly seen in both the non-Aboriginal and Aboriginal population, such as impaired driving, speeding and lack of seatbelt use.

Exposure

Two youths died as a result of exposure. One death occurred in the North and the other in the Interior. Both deaths were determined to be alcohol-related; the youths were reported to be heavily intoxicated in the hours prior to their death and failed to make it home safely after leaving the company of their peers. In both cases, the youths were found lying outside in open areas of the community several hours after their collapse and had suffered prolonged exposure to cold winter temperatures. Additional information on death due to exposure to cold is included on page 27.

In addition to alcohol use and cold weather, other possible contributory factors in these cases included the quality of first response upon discovering the youths and timely access to sufficient emergency care. One of the youth was found semi-conscious but taken home; it was assumed he was recovering from a night of heavy drinking. Appropriate treatment for hypothermia was not provided until several hours later, when the youth lost his vital signs and was taken to hospital. In the second case, the youth was first discovered by police and determined to be dead when no pulse was detected. Re-warming techniques or other forms of medical treatment were not provided to this youth.

Detailed data on the prevalence of alcohol-related exposure among Aboriginal children and youth is limited. A study by B.C. Vital Statistics that examined exposure deaths across all age groups in B.C. over a 10 year period reported a disproportionate number of cases involving Aboriginal people. This was particularly true of hypothermia and exposure deaths that involved alcohol, in which 40 per cent of the deaths were of Aboriginal people.⁷¹

Poisonings

Of the cases referred to the CDRU in 2006, three children died due to unintentional poisoning. Two of these cases involved Aboriginal youth (one male, one female) who died as a result of alcohol poisoning. Both of these youths were known by family and friends to be binge drinking in the months prior to their deaths. One youth was known to have a chronic problem with alcohol misuse. In the three years preceding his death, the youth was admitted to hospital on seven separate occasions for alcohol intoxication, in some cases after being found unresponsive by friends or community members. There was no documentation to suggest that follow-up treatment after these hospitalizations was provided for the youth (i.e., addiction treatment or a referral for counselling services).

The number of deaths due to unintentional poisoning has historically been higher than average among Aboriginal people.⁷² From 1992 to 2003, there were an average of 44 deaths and 96 hospitalizations per year among First Nations people due to unintentional poisoning.⁷³ Among this group, 70 per cent were between the ages of 25 and 44 years old.⁷⁴ Although this data suggests that children and youth are not the age group at the greatest risk, unintentional poisonings still occur among younger age groups and can involve substances other than alcohol (such as prescription medication and household cleaners).

Intentional Injuries

Suicide

Aboriginal children represented 20 per cent (3 out of 15) of the total number of suicide cases referred to the CDRU in 2006. All of these cases involved female youths, one of whom lived on reserve. Males are generally considered to be at higher risk for dying by suicide than females, however the prevalence of females among the reviewed cases is a reflection of the high rate of suicide which exists for Aboriginal youth regardless of gender. For First Nations youth, the suicide rate is five to seven times higher than for non-Aboriginal youth.⁷⁵

A common theme in many of the children's lives was the presence of underlying, chronic life stressors (such as depression) in combination with an acute crisis prior to death. In all of the cases involving Aboriginal children, a recent argument with a family member or romantic partner was a precipitating factor. Other acute crisis included the recent death of a relative and loss of a peer due to suicide. In addition to facing these acute events, underlying factors for two of these children included depression (including prior threats of suicide) and being victims of previous abuse or neglect. Alcohol or drug use was also a factor in these two cases.

In addition to situational and socio-economic factors (such as poverty, inadequate housing and limited employment opportunities), culture stress as a risk factor for suicide has been identified as particularly significant for Aboriginal people. Culture stress refers to the loss of confidence in the ways of understanding life and living that have been taught within a particular culture, caused by changes to the language, knowledge, beliefs and values that collectively bind people within their culture.⁷⁶

Over the past decade, the rate of suicide among First Nations has been significantly higher when compared to other B.C. residents. Although the rate decreased during late 90s, suicide has not shown the same degree of decline seen in other areas of injury over recent years. A substantial gap still exists between First Nations and the general population with respect to suicide. According to results from the Regional Health Survey, 9.6 per cent of First Nations youths had attempted suicide; 21 per cent had thoughts of suicide.⁷⁷

When examining the prevalence of suicide among First Nations, it is important to recognize the significant variation which exists across different communities in the province. Youth suicide is not an issue in every community; more than half of First Nations communities in B.C. reported no youth suicides between 1983 and 2000.⁷⁸ Researchers Chandler and Lalonde explored this dynamic further and found that various risk and protective factors (related to cultural continuity and local control) can account for differences in suicide rates between First Nations communities.⁷⁹ Examples of protective factors found within communities with lower suicide rates included self-governance, involvement in land claims and Band control of services such as education and health.⁸⁰

Homicide

Two of the injury deaths involving Aboriginal children were homicides. These were the only incidents of homicide among all cases referred to the CDRU in 2006. These cases involved two female siblings of preschool age who were killed in a single incident of murder-suicide. The children died due to intentional carbon-monoxide poisoning, completed by their parent. This incident occurred in the family's home, which was located off-reserve. Social and economic risk factors were identified in the deaths of these children.

The homicide mortality rate for Aboriginal people ranks below the rate for several other types of injury fatalities in this population, including motor vehicle incidents, drowning, suicide and poisoning. Despite this, Aboriginal people are still over represented among the total number of homicides in the country. Although Aboriginal people represent approximately three per cent of the population in Canada, they represented 17 per cent of victims and 23 per cent of persons accused of committing homicide in 2005.⁸¹

What risks did the children face?

The distribution of risk factors that were present among the cases of injury deaths involving Aboriginal children are shown in Table 16. Risk factors have been grouped into the category of behavioural, social, environmental, economic, developmental and medical (see definitions on page 10). It is important to note that a combination of risk factors were often present in the child's life and death.

Individual risk factors were identified using information included in the coroner's file. The extent of information on these risk factors was often limited, particularly in the social and economic category, and therefore does not reflect all the different factors that may have contributed to the children's circumstances. In examining this data, it is important to note that lack of data on the file does not necessarily translate to absence of risk for the child. Enhanced data collection would allow for more in-depth analysis into the complexity of social, economic and cultural factors that contribute to outcomes for Aboriginal children.

Social, behavioural and environmental risk factors were most predominant for Aboriginal children who died due to injury. This contrasts slightly to the non-Aboriginal population, where environmental and social factors were less prevalent. Multiple risk factors were present in the lives of 90 per cent of Aboriginal children who died due to fatal injury, which demonstrates the complexity of challenges faced by these children.

Risk factor	Percentage of cases where factor was identified
Social	82%
Behaviour of individual	64%
Behaviour of others	36%
Environmental	27%
Developmental	18%
Economic	18%
Medical	9%

Table 16. Distribution of risk factors for injury deaths of Aboriginal children

What trends are evident?

Alcohol Use

Alcohol is a major contributor to injury, and is reported to be present in close to 40 per cent of accidental and violent deaths among Aboriginal people.⁸² This trend is evident among the 11 reviewed cases of fatal injury involving Aboriginal children, where alcohol was a factor in six (55 per cent) of the deaths. In comparison, three per cent of injury deaths involving non-Aboriginal children were determined to be alcohol-related.

Contrary to what these findings may suggest, the overall rate of abstinence from alcohol is found to be higher among Aboriginal people in comparison to the general population. Results from the First Nations Regional Longitudinal Health Survey (RHS) suggests that the problem is not the overall use of alcohol in First Nations, but rather the higher rate of heavy drinking among those who do use alcohol.⁸³ Aboriginal youth are reportedly at two to six times higher risk for alcohol-related problems compared to other Canadian youth.⁸⁴

Research shows that for both non-Aboriginal and Aboriginal people, risk factors for heavy drinking include being young, male and of low socio-economic status.⁸⁵ For First Nations, Métis and Inuit peoples specifically, substance misuse has also been linked to high rates of poverty, family breakdown, unemployment and poor social and economic structures.⁸⁶

Physical Environment

Aboriginal children and youth from northern B.C. showed greater vulnerability to injury-related death in which environmental risk factors often placed the children at increased risk of harm. Several risk factors related to physical environment are more prevalent, and in some cases unique, to Northern communities. Cold temperatures, remoteness and exposure to large bodies of water are examples of factors that place many residents of the North, both non-Aboriginal and Aboriginal, at greater risk of injury. Aboriginal communities in the North may also face challenges that are unique to their population. Hunting lifestyle, housing conditions (overcrowding, dilapidation), social conditions and lack of safety devices and procedures all place these communities at increased risk of injury.⁸⁷

Access to Care

Issues regarding access to and receipt of care were present in multiple cases involving Aboriginal children, particularly relating to mental health and addiction treatment in cases of suicide and alcohol-related deaths. Two of the three Aboriginal children who died by suicide showed symptoms of depression and reported suicide ideation prior to their death. Neither of the children received mental health treatment or counselling services to address these health concerns. Reasons for absence of treatment were unclear.

Among the alcohol-related deaths, four of the children were known within the community to have ongoing alcohol misuse and addiction issues. These children did not receive addictions treatment. One of the deaths involved a youth who had multiple hospitalizations for alcohol intoxication with no follow-up or referral for further treatment. In a second case of alcohol-related death, it was reported that the youth personally sought out treatment for alcohol misuse but was unable to access a local program. As found in the suicide cases, the reasons for absence of treatment or lack of access to care for these youths were unclear.

Access to care has been identified as an issue for Aboriginal communities, particularly in remote areas which may lack hospitals or primary care facilities. Results from the First Nations Regional Health Survey found that more isolated communities had higher injury rates compared to non-isolated communities. In addition to unavailable and inadequate local services, other barriers to care identified in the survey included long waiting lists, cultural appropriateness, costs and transportation.⁸⁸

Children Known to MCFD

Four children who died as a result of unintentional or intentional injury were known to MCFD, none of whom were in care at the time of their death. These children represent 36 per cent of the 11 cases of injury-related death of Aboriginal children. This finding reflects the disproportionate number of Aboriginal children who have involvement with the Ministry of Children and Development through their childhood. Aboriginal children are more likely to come into contact with MCFD and are over-represented among those served by the ministry.⁸⁹

Were their deaths preventable?

Upon review, all 11 deaths were determined, in all likelihood, to be preventable. This finding highlights the importance of understanding injuries as predictable and preventable events, as an alternative to considering them as unavoidable accidents.

Injury prevention can occur at the primary, secondary or tertiary level. Primary prevention includes targeting the underlying cause of the injury problem and stopping these incidents before they happen. **Primary prevention** is the most effective and preferred approach to injury prevention. In addition to making environmental and legislative changes to increase safety, primary prevention also includes improving health status (for example, through mental health and addiction treatment) and working to reduce social inequalities that impact decision making and place Aboriginal children and youth at greater risk of injury. **Secondary prevention** refers to safety measures that can be taken to reduce the chance or extent of harm if an incident occurs. This can include the use of seatbelts and lifejackets, in addition to improving first aid and emergency response provided at the time of injury. Lastly, **tertiary prevention** includes actions taken after the incident occurs to prevent permanent harm and aim for the best available outcome. Although opportunities for tertiary prevention are less common in the context of fatal injuries, this level of prevention can apply in cases where death did not occur at the time of the event and acute care was provided to the child post-injury.

All cases of fatal injury involving Aboriginal children were determined to be preventable at the primary level. Four of these cases were also determined to be preventable at the secondary level and two cases of fatal injury were identified as having opportunities for prevention at all levels of prevention, including tertiary.

3 | Natural Deaths

This section includes all cases of natural death involving Aboriginal children including both natural unexpected deaths (coroner cases) and natural expected deaths (non-coroner cases and those reported through Vital Statistics). The number of children identified as Aboriginal among cases of natural death is an underestimation of unknown extent. This is due to limitations in identifying Aboriginal status solely from information provided on a child’s registration of death.

Fifteen of the 27 Aboriginal children (55 per cent) died of natural causes. A review of their deaths resulted in the following findings:

Who were the Children?

- Eight (53 per cent) of the children were females and seven (47 per cent) were males;
- The majority of natural deaths involved neonates, who accounted for seven (47 per cent) of the 15 cases. Among the remaining children, five were infants and one was of preschool age. The remaining two children were stillbirths;
- Five children were confirmed to be living on reserve; and
- Two children were known to MCFD.

Where did their deaths occur?

The Metro region accounted for a slightly greater number of child deaths, as outlined in Table 17. Although six of the deaths occurred in the Metro region, three children among this group actually resided in areas outside the region. As commonly seen in critical care cases in the province, these children were transported to B.C. Children’s Hospital in Vancouver prior to their death.

Region of death	Number of cases
Metro	6
North	5
Fraser	2
Interior	1
Island	1
TOTAL	15

Table 17. Regional distribution of natural deaths involving Aboriginal children

How did the children die?

The causes of death pertaining to natural deaths of Aboriginal children are shown in Table 18. Complications during the perinatal period were responsible for six (40 per cent) of the 15 natural deaths, making it the leading cause of death among this group. This is consistent with findings in the non-Aboriginal population.

Classification	Number of cases
Conditions arising during the perinatal period	6
Respiratory	2
Metabolic, Endocrine and Nutritional	1
Central Nervous System	1
Sepsis	1
Congenital and Chromosomal	1
Cardiovascular	1
Stillbirth	2
TOTAL	15

Table 18. Causes of natural deaths among Aboriginal children, based on CDC classification

What risks did the children face?

Information regarding risk factors and the life circumstances of children who died as a result of natural causes is very limited. Among the three cases which were classified as natural unexpected deaths, information provided on the coroner's file provided some opportunity for the identification of risk factors. Medical factors were identified as contributors in all of the cases. In two of the three cases, developmental and environmental factors were also identified as being challenges in the child's life. In analyzing the level of preventability in coroner cases, one of these deaths was determined, in all likelihood, to be preventable with improved care management.

There is abundant literature which identifies factors affecting the health and wellness of Aboriginal people, such as cultural continuity, poverty, education and access to services. The limited amount of information on natural deaths currently available to the CDRU presents a challenge to comprehensive analysis of the risks and trends that were present for the children. More detailed data regarding the above determinants of health would allow the CDRU to address the underlying challenges impacting the health of Aboriginal children in B.C.

What trends are evident?

This section provides further information on the prevalence of premature births and infant mortality among the cases of Aboriginal child death due to natural causes. Other factors that are often explored in relation to Aboriginal child health, such as low birth weight and access to prenatal care, are not elaborated on in this section due to limitations in data.

Premature Births

Prematurity (gestational age of less than 37 weeks) was identified as a factor in three cases of natural death involving Aboriginal children. Gestational age was unknown among the remaining cases in this category. Recent trends show that the rate of pre-term births is increasing in both the Aboriginal and non-Aboriginal population in B.C.⁹⁰ Similar to the trend seen in other areas of risk, the rate among the Aboriginal population is higher in comparison to other B.C. residents. Prematurity leads to increased vulnerability to illness and is a major cause of morbidity and mortality in reproductive care. Although an increase in pre-term births is seen in both the non-Aboriginal and Aboriginal community, the maternal health factors which are contributing to this trend are thought to differ between the populations. As reported by the Provincial Health Officer, many of the contributing factors that are thought to lead to prematurity in the non-Aboriginal population (such as increased maternal age) do not apply when placed in the context of Aboriginal health.⁹¹ Further investigation is required to identify what unique challenges Aboriginal mothers are facing, and how this may result in a greater incidence of pre-term births.

Infant Mortality

Fourteen (93 per cent) of the 15 Aboriginal children who died due to natural causes were one year of age or younger. Infant mortality follows the same trend as other factors discussed in this report, whereby the overall death rate in the Aboriginal population has decreased over the past decade but continues to be higher in comparison to the non-Aboriginal population. Current research shows that the infant mortality rate for the Status Indian population specifically has shown a slight increase over the past five years.⁹²

4 | Undetermined Deaths

Among the Aboriginal children included in this report, one case was undetermined and classified as Sudden Unexpected Death in Infancy (SUDI). This case involved a 6 month old boy who resided in the North region, and was one of three cases of SUDI referred to the CDRU in 2006. Risk factors in this child's death included bed-sharing in an adult bed, presence of soft bedding and placing the baby to sleep in a prone position, which are some examples of known risk factors that contribute to SUDI. Further discussion on SUDI and related risk factors is included in Part 6.

Although new classifications differentiate between cases of SUDI and Sudden Infant Death Syndrome (SIDS), historically these deaths were placed into the single category of SIDS. From 1992 to 2000, SIDS was the leading cause of infant mortality in the Status Indian population, peaking in 1995 and subsequently declining to reach a low in 2000.⁹³ Since this time, an increased understanding of the risk of factors contributing to sudden infant death resulted in a growing number of cases, historically classified as SIDS, to now be attributed to positional asphyxia or other causes. In November 2004, the BC Coroners Service began using the designation of SUDI to differentiate between cases where specific risk factors are present that can not be excluded from causality of death, and those which present with an absence of risk factors (classified as "classic SIDS").

5 | Conclusion and Next Steps

Aboriginal children and youth are over represented in many circumstances of death discussed in this report. The forces behind this vulnerability are multifaceted and reflect complex social, cultural and historical issues. Although these issues compel more in-depth analysis than what is provided in this report, the intent of this section is to share what may be learned from the 27 Aboriginal children who died, and provide a base upon which more detailed future analysis and discussion can follow.

The CDRU is committed to working collaboratively on Aboriginal-led strategies to address the vulnerability of Aboriginal children and youth in B.C.. The CDRU recognizes that significant work and momentum is already underway to address child health, injury prevention and safety promotion in Aboriginal communities. This includes actions of the First Nations Leadership Council (FNLC) and the development of the First Nations Health Plan in 2006. The CDRU is looking forward to building on this momentum by working with the FNLC and other stakeholders to support further progress in the areas of Aboriginal child health and wellness.

Recommendations:

9 | To the Chief Coroner of B.C.

The CDRU recommends that a Child Death Review Panel be established to review alcohol-related deaths of Aboriginal children and youth in British Columbia.

Part 9

Children known to the Ministry of Children and Family Development (MCFD)

1 | Overview

Of the 244 cases reviewed by the CDRU, 55 involved children known to MCFD. Children “known” to MCFD are children who had been in receipt of services at some point in the 12 months prior to their death. A review of the 55 cases determined the following findings:

Who were the children?

- The most prevalent age group among children known to MCFD was youth, who comprised twenty deaths. The second leading age group was children aged 5 to 12 years old. Infants and preschoolers represented nine deaths each. Three children were neonates;
- Twenty-eight of the children were male and twenty-seven were female;
- Five (10 per cent) of the 55 children were Aboriginal;
- Six children had been involved with youth justice; and
- None of the children had been involved with Child and Youth Mental Health.**

***MCFD Child and Youth Mental Health advised that due to limitations within their information management system, they were able to track eighty percent of the children served by the program area. It is likely that a number of children whose deaths were reviewed were served by Child and Youth Mental Health however, the number cannot be confirmed.*

What services were provided?

The majority of children (56 per cent) were served by Community Living BC (CLBC) only, as shown in Figure L. Twenty per cent of the children known to MCFD were served by Child and Family Services only. Among the four children in care at the time of their death, one child was in care via a Continuing Custody Order.

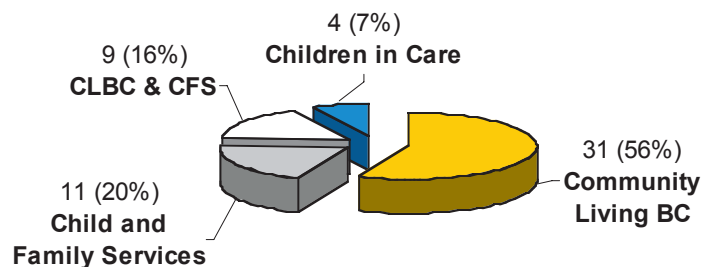


Figure L.
Number of children known to MCFD by services provided.

Where were the children from?

The majority of children known to MCFD were from the Fraser region, which accounted for 42 per cent of the reviewed cases. As outlined in Table 19, the Interior region was the second leading region of death for children known to the MCFD.

How did the children die?

Eighty per cent of children known to MCFD died of natural expected causes (see Table 20), which was significantly higher than any other manner of death.

Manner of death	Number and percentage of cases reviewed
Natural Expected	44 (80%)
Accidental	4 (7%)
Suicide	3 (5%)
Natural Unexpected	4 (7%)
TOTAL	55

Table 20. Number of children known to MCFD reviewed by manner of death.

Region of residence	Number and percentage of cases reviewed
Fraser	23 (42%)
Interior	12 (22%)
North	8 (14%)
Metro	8 (14%)
Island	4 (7%)
TOTAL	55

Table 19. Number of children known to MCFD by region of residence

2 | Children served by Child and Family Services (CFS)

What risks did the children face?

The distribution of risk factors that were present among the deaths of children served by Child and Family Services (CFS) is shown in Table 21. These risk factors have been grouped into the category of behavioural, social, environmental, economic, developmental and medical. A description of these risk factors is provided on page 10. With the exception of one case, a combination of risk factors was present in the lives of the children and youth. Social, medical and behavioural (both of the deceased and other individuals) factors were the most prevalent for children served by CFS. In these cases, substance abuse, peer issues, neglect, high risk activities, poverty, family disruption and relationship issues (family and partner) were common themes throughout their lives. Alcohol and/or drugs were found to be a factor in five (45 per cent) of the deaths.

Risk factor	Percentage of cases where factor was identified
Social	64%
Medical	64%
Behaviour of individual	55%
Behaviour of others	18%
Environmental	18%
Developmental	18%

In eight of the cases, the children and their families had been served by CFS at several times in their lives and in some instances had been known for many years. Many children were served by various community agencies and service providers during their young lives. School aged children were often known to teachers and school counsellors as a result of the challenges they faced in life due to poverty, family disruption, and school difficulties.

Table 21. Risk factors identified for children known to MCFD

Transition from Youth to Adulthood: Planning for Independence

A lack of meaningful long term planning to minimize placement changes and disruptions was an issue found in several of the children's lives. In two cases where the youths were served by CFS, concerns over finances and planning for their future were found to be contributing factors in their deaths. These youths were 17 and 18 years of age respectively and the transition from youth to adulthood and future independence appears to have been a major concern for these two. Statistics from the Ministry of Children and Family Development reveal that in the years 2005 and 2006, 37 per cent of children in care who age out at 19 years immediately apply for income assistance. While this percentage has continued to decline since 2000 when it was reported at 47 per cent, it does illustrate the importance of planning for independence and adulthood.

The National Youth in Care Network has highlighted how disruptions and placement changes has an impact on a youth's ability to form positive relationships and success in their lives: "the cyclical nature of perceived rejection, acceptance and rejection affect a youth's ability to form secure attachments that would act as a protective factor".⁹⁴ Whether it is moving from home to foster home to family and back to a different foster home, or from one service to the next because of different mandates, children with multiple needs are bounced from one service to the next creating a lack of stable personal relationships and an inability to trust.⁹⁵

Reducing the Revolving Door Phenomenon

Early identification and prevention along with building on the strengths identified in families is paramount in case planning for children and families. Providing service to families at the front end may help to reduce rates of reoccurrence of families in the child welfare system. Reoccurrence (or recidivism) refers to when a family neglects and/or abuses their children within 12 months of a previously confirmed incidence of child neglect and/or abuse. Recurrence is measured over a set period of time and could be an indication of an ongoing problem that might require more intensive intervention.⁹⁶

MCFD statistics reveal that the rate of reoccurrence as of November 2006 was 29 percent, which is the same as it was in 2000. Rates of reoccurrence among Aboriginal families in the child welfare system were 39 percent in the same period as compared to 43 percent in 2000. In the majority of cases reviewed by the CDRU where children were known to MCFD, the children and families had been served by MCFD on many occasions throughout their lives, not just in the 12 months prior to their deaths.

What trends are evident?

Many of the children who died while in care or those in receipt of services, share similar characteristics to those across Canada. At times, parents of these children struggle as a result of poverty, substance abuse, mental health issues, domestic violence and their own childhood histories of abuse.⁹⁷ These parents often have few if any social supports or family members to rely on in a time of crisis. Simultaneously, the ability of children to function in these environments is illustrated in their behaviours including problems in the community, substance misuse, violence, running away and irregular school attendance. This is further exacerbated by children who have complex physical and/or developmental delays, medical or mental health concerns that make it challenging for a parent to care for their children.

Were their deaths preventable?

Of the 11 children served by Child and Family Services, seven of the deaths were determined to be preventable at the primary level. In one of these cases, the death was considered to be preventable at both the primary and secondary levels. The remaining four children died of natural causes and their deaths were determined to be not preventable.

Future Directions

It is imperative that cross Ministry discussion and planning take place to provide a system of integrated service delivery. The Honourable Ted Hughes wrote in the B.C. Children and Youth Review (2006), “What will be required more than anything is a spirit of cooperation and collaboration...not only in the Ministry of Children and Family Development, but in other ministries and government agencies as well”.

3 | Children served by Community Living BC (CLBC)

Community Living BC (CLBC) provides a variety of support services to 8,600 children with special needs and their families. These services include family support, respite, child and youth care workers, home support and residential services for children in care under the Child, Family and Community Service Act. In some instances, children and families will receive services from both CLBC and Child and Family Services. CLBC provides service for children who have an Autism Spectrum Disorder diagnosis, are eligible for the At Home Program (children with a severe disability) or have a developmental disability that has been confirmed by a registered psychologist.

Children who were served by CLBC comprised the largest group within those known to MCFD. The following sections provide further details on findings pertaining to these children.

Who were the children?

- Forty-one children were known to CLBC; one of which was a child in care;
- Eight infants, eight preschoolers, 14 children and 11 youths were known to CLBC;
- Twenty-two (54 per cent) of the children were male. Nineteen (46 per cent) were female;
- Most children were from communities within the Fraser and Metro regions (see Table 22)
- The majority of children died in hospitals or hospices within the Fraser and Metro regions. This is likely due to the high number of these facilities within these regions when compared to the other regions.

Region of residence	Number and percentage of cases reviewed
Fraser	17 (41%)
Metro	12 (29%)
Interior	7 (17%)
North	4 (10%)
Island	1 (2%)
TOTAL	41

Table 22. Number of children known to CLBC by region of residence

How did the children die?

Respiratory conditions were the leading cause of natural death for children served by CLBC, followed closely by neoplasm. Table 23 provides an overview of causes of death among children known to CLBC.

Classification	Number and percentage of cases reviewed
Respiratory	16 (39%)
Neoplasm	14 (34%)
Congenital and Chromosomal	4 (10%)
Metabolic, Endocrine and Nutritional	2 (5%)
Central Nervous System	2 (5%)
TOTAL	41

Table 23. Number of children known to CLBC by cause of death, based on CDC classification

Were their deaths preventable?

CLBC provides many programs to support and educate families as they care for their children. The Infant Development Program for example, serves approximately 5,000 families a year providing both community and in-home support. In all of the cases reviewed by the CDRU, the children died of natural causes and all of their deaths were deemed to be not preventable. The children known to CLBC had medical issues that placed them at a high degree of fragility.

Part 10

BC Coroners Service Operations

1 | Pathology

Of the 63 coroner cases reviewed:

- A post-mortem examination was conducted in 40 (63 per cent) of the 63 cases.
- External examinations were conducted in five cases. Two cases required anthropological analysis.

The Coroners Act allows a coroner to authorize a pathologist to conduct a post mortem examination to determine the medical cause of death. BC Coroners Service policy directs when a full autopsy is mandatory:

- where the cause of death cannot otherwise be determined;
- all suspected homicide/suspicious deaths;
- all suspected SIDS deaths;
- all suspected abuse deaths;
- all police custody deaths; and
- all correctional deaths.

In addition, a full autopsy will be conducted in the following circumstances:

- all operators of vehicles, boats, aircrafts;
- all passengers of vehicles, boats, aircrafts;
- driver/passenger not established;
- all hit and run collisions;
- all industrial deaths;
- drowning deaths; and
- apparent drug overdoses.

2 | Toxicology

Of the 63 coroner cases reviewed:

- A toxicological analysis was conducted in 34 (54 per cent) of the 63 cases;
- Of the 34 analyses, 12 (35 per cent) were clear. Substances were detected in 22 (65 per cent) of the 34 analyses. Therapeutic levels of a prescribed medication or an over-the-counter medication were detected in six (27 per cent) of the 22 cases;
- In 16 (72 per cent) of the 22 analyses where a substance was detected, toxicology was positive for a substance other than prescription or over-the-counter medications; and
- Ethyl alcohol and cannabinoids were the substances identified most frequently. In three cases, alcohol and cannabinoids were detected concurrently.

The Coroners Act authorizes the coroner to have a toxicological examination of body fluids, tissue, and/or organs when drugs are suspected of being involved or when the cause of death cannot otherwise be established. BC Coroners Service policy directs that the following scenarios could lead to a toxicological examination:

- motor vehicle incidents;
- fire victims;
- industrial death;
- transportation safety board;
- suspected abuse of drugs including illicit (street drugs) and prescription and over the counter medications;
- drowning deaths; and
- custody deaths.

During the review process, the CDRU found instances where toxicological testing would have been helpful for the purpose of considering risk factors and preventability. For example, toxicology testing for suicides is crucial in determining compliance with medication and substance use; both of which are known risk factors for youth suicide. Toxicological examination was completed in six of the 15 cases of suicide reviewed by the CDRU. The rising economic cost of both toxicology and pathology in the province is a significant concern for the BC Coroners Service, however, such testing is crucial to determining both how and why children are dying. This ultimately informs how similar deaths may be prevented in the future.

3 | Scene Recreation for Sudden Infant Deaths

Sudden Unexpected Infant Death: Initial Presentation

Upon initial presentation, many infant deaths appear to be SUDI as the primary cause of death can not be easily determined. Once an investigation has been completed, a different classification may be established. These may include:

- accidental asphyxiation (i.e. from overlay during bed-sharing);
- strangulation (i.e. from long ties from bumper pads);
- poisoning (i.e. accidental ingestion of toxic substance);
- homicide (i.e. shaken baby syndrome); and
- natural causes (i.e. undiagnosed heart defect).

As many of these may not be determined from a clinical history-taking, autopsy and scene recreation are instrumental in understanding the exact mechanism of death. Greater understanding of circumstances related to the death help inform preventative strategies and education campaigns.

Sudden Unexpected Infant Death: Death Scene Investigation

Death scene investigation is an integral and vital part of determining the sequence of events that may have led to a child's death, as well as determining classification and manner of death. Death scene investigation should be undertaken in all instances of sudden unexpected death of an infant or child. This process can be hindered by the event itself, if the infant is removed from the scene and transported to hospital.

The Washington State Criminal Justice Training Commission (www.cjtc.state.wa.us) has developed guidelines to be used by first responders in cases of child death. Their four step approach, C-POD, consists of:

- **Collaboration:** for a coordinated investigation utilizing all expertise from coroners, law enforcement, emergency first responders, medical specialists/ pathologists, and child protection/social workers;
- **Preservation:** maintenance of scene integrity, after all resuscitation attempts are completed;
- **Observation:** suspend assumptions and consciously examine environment; and
- **Documentation:** record everything about the scene, the child and the witnesses.

Ideally, a full description and depiction of the death scene should be documented with photographs or video and the appropriate SUDI form should be completed.

Nationally, forensic pathologists consider the following information critical to the determination of the cause and manner of death with regard to infant death investigation:

1. Case Information;
2. Asphyxia;
3. Sharing sleep surfaces;
3. Change in sleep conditions;
5. Hyperthermia/hypothermia;
6. Environmental hazards (CO, chemicals, etc);
7. Unsafe sleeping condition;
8. Diet;
9. Recent hospitalizations;
10. Previous medical diagnosis;
11. History of acute life threatening events;
12. History of medical care without diagnosis;
13. Recent fall or other injury;
14. History of religious, cultural, or ethnic remedies;
15. COD due to natural causes other than SIDS;
16. Prior sibling deaths;
17. Previous encounters with police or social service agencies;
18. Request for tissue or organ donation;
19. Objection to autopsy;
20. Pre-terminal resuscitative treatment;
21. Death due to trauma (injury), poisoning, or intoxication;
22. Suspicious circumstances;
23. Other alerts for pathologist's attention; and
24. Description of circumstances (what happened?)⁹⁸

Scene recreation using a doll has proven to be helpful in coming to understand the sequence of events. The type of doll may vary (life-like, differing skin tones, rag doll) however the front and back of the doll should be apparent for proper understanding of positioning. The doll's neck should be able to articulate in order to show the position of the head. These re-enactments should be photographed for the file.

It is critical that coroners receive specific training on how to conduct child death scene recreations. Lessons learned from child death scene recreation are vital to aid in understanding variables, such as:

- Knowledge deficits regarding safe baby care;
- Consumer product safety concerns;
- Socio-cultural influences over parental decision making;
- Disparity in statistics due to economic or racial factors; and
- Access to services of affected families.

Trends and patterns learned from data gathered at death scenes are the cornerstone for developing evidence-based population strategies addressing infant mortality. Creation of partnerships with all stakeholders, including health care professionals, first responders, law enforcement, communities and families can be enriched through investigation and analysis of this important information.

Recommendations:

10 | To the Chief Coroner of B.C.

The CDRU recommends that in all SUDI deaths, detailed death scene investigations and scene recreations be conducted by coroners who have received specific training in these areas.

Part 11

Case Dispositions

Following the internal multi-disciplinary review of a child's death, the CDRU may select one or more dispositions for future action. All cases referred to the CDRU are reported out in aggregate in an annual report. Additional options for case disposition include referral for a special review or referral to a child death review panel.

Special Review

Cases that share similar cause, manner and/or circumstance of death lend themselves to a focused special review process. A special review facilitates a more detailed analysis of the data with reports directed to the general public.

The CDRU intends to issue a special report on child and youth suicide. The 15 suicide deaths from this 2006 annual report will be included. The report on suicide will be released in September 2008 to coincide with World Suicide Prevention Day.

Child Death Review Panel

The Chief Coroner may establish a panel to review the facts and circumstances of one or more child deaths. The panel will examine CDRU findings and apply their expertise to the development of recommendations.

Part 12

Summary of CDRU Recommendations

1 | **To the Ministry of Tourism, Sports and Arts:**

The CDRU supports the Ministry of Tourism, Sports and Arts in their ongoing initiative to review best practice guidelines for the use of off-road vehicles (ATVs, snowmobiles and dirt bikes), and recommends that the Ministry move beyond guidelines towards a regulatory framework on licensing and registration of off-road vehicles.

2 | **To the Chief Coroner of B.C. and the Office of the Superintendent of Motor Vehicles (Ministry of Public Safety and Solicitor General):**

The CDRU recommends that the viability of linking licensing of specific motorcycles to specific training and education be examined as part of the joint project currently underway.

3 | **To the Chief Coroner of B.C.:**

The CDRU recommends that the specific findings related to exposure deaths of Aboriginal children be provided to the Representative for Children and Youth to inform advocacy strategies for Aboriginal communities in B.C..

4 | **To the British Columbia Chiefs of Police:**

The CDRU recommends that all law enforcement jurisdictions review current policy to ensure the inclusion of actions required when attending a scene where the victim may be hypothermic.

5 | **To the Chief Coroner of B.C.:**

The CDRU recommends that coroners provide survivors of suicide with a practical guide for dealing with a suicide death, using best practice resources which are currently available from national suicide prevention agencies in the province.

6 | **To the Ministry of Education:**

The CDRU recommends that all school districts review policies related to suicide risk assessments to ensure they include the identification and assessment of any acute crises presenting in the child's life.

7 | **To the Canada Firearm Centre:**

The CDRU recommends the initiation of regulations that require mandatory trigger locks for all firearms at the time of purchase and further that written safe storage guidelines also be provided at point of sale.

8 | To the Chief Coroner of B.C.:

The CDRU recommends that all written reports pertaining to child deaths that are classified as undetermined be reviewed by the child death investigation and paediatric investigation coroners prior to conclusion.

9 | To the Chief Coroner of B.C.:

The CDRU recommends that a Child Death Review Panel be established to review alcohol-related deaths of Aboriginal children and youth in British Columbia.

10 | To the Chief Coroner of B.C.:

The CDRU recommends that in all SUDI deaths, detailed death scene investigations and scene recreations be conducted by coroners who have received specific training in these areas.

Acknowledgements

The 244 child deaths discussed in this report were reviewed between May and August 2007. The internal CDRU multi-disciplinary case review meetings were held over ten days and were lead by unit members: Tansey Ramanzin (Paediatric Medical Specialist); Matthew Brown (Case Review and Investigation Specialist); Meredith Sones (Outreach and Prevention Specialist); and Alix Mosby (Research and Program Analyst). The unit was well-supported by Program Assistant Anita Tamber.

Guest participants were well recognised child death review experts - Theresa Covington, Director of the National Center for Child Death Review, Michigan, USA; Deborah Robinson, Infant Death Specialist, Northwest Infant Survival Alliance, SIDS Foundation of Washington, Seattle, USA; and Anara Guard, Associate Center Director, Suicide Prevention Resource Center, Boston, USA. These individuals were instrumental in assisting with the case reviews and with the development of the child death review protocol and framework.

We continue to be grateful to the men and women of the BC Coroners Service who work tirelessly around the clock to identify who these children were and how, when, where and by what means they died. These coroners often put their own lives aside in order to attend to the children and their families at the most tragic of times.

Finally, the CDRU would like to thank Chief Coroner Terry Smith and his Executive team who provide support, encouragement, leadership and solid advice as we move forward to build a comprehensive provincial child death review unit.

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