
**A Review of the Mortality Experience of
Children and Youth in Care:
1986 to 2005,
British Columbia,**

**An Updated Technical Report of the
Provincial Health Officer for B.C.***

**in Cooperation with
The Child and Youth Officer for B.C.,
The Ministry for Children and Family Development, and
The B.C. Vital Statistics Agency**

September, 2006



Office of the
Provincial Health Officer



* This document updates data presented in a previous Technical Report published in May 2001.

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Notice to the Reader

The mortality data in this Technical Report and in the Joint Special Report *Health and Well-Being of Children in Care in British Columbia: Report 1 on Health Services Utilization and Mortality*, while in many respects being similar and complementary, are not directly comparable due to differences in data sources, analytical methods, case definitions, and time periods.

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- Rosemary Armour, Medical Advisor, Information Management, Knowledge Management and Technology.

The project team also relied heavily on the previous work of a former team member of the last project team which analyzed CYIC mortality for the Provincial Health Officer:

- Julie Macdonald, Retired, Formerly Medical Advisor, B.C. Vital Statistics Agency, Ministry of Health.

Introduction

The mandate of the **Child and Youth Officer** is to support children, youth, and families to access relevant government services, to observe independently those services, and to advise government about how to improve them.

The **Provincial Health Officer** reports independently to the Minister of Health and directly to the public on health issues. This includes the production of an Annual Report on the health of British Columbians, which in 1997 consisted of a Feature Report on Child Health, entitled "*The Health and Well-being of British Columbia's Children*".

While primarily concerned with the general interests of all children in the province, this report also addressed the societal interest in the health status of a particularly vulnerable group of children -- Children and Youth in Care (CYIC).

If a family is unable to care for a child, the child welfare authorities may temporarily or permanently assume responsibility for the child, by authority of the *Child, Family and Community Services Act*.

Children who require this custody, care, or guardianship, come into the care of the Ministry for Children and Families, and are referred to in the *Act* as "children in care". The term "**children and youth in care**" is used in this study, as many of these individuals are youth aged 13 to 18 years.

Children come into care for a variety of reasons. Protection may be required due to abuse or neglect, parents may be absent or unable to care for their child, or the child may require medical or other special care.

In his 1997 Annual Report, the Provincial Health Officer noted that an analysis of more complete information on the health status of CYIC could assist in monitoring future progress in improving their health, and provide a means by which their mortality experience and other health outcomes could be evaluated over time.

Some specific recommendations by the Provincial Health Officer concerning the health and welfare of CYIC included the following:

- *Develop strategies to address the factors underlying the **inequities in children's health status**: inequalities in income, social status, housing, and other aspects of daily life.*
- *In addition, address the special needs of at-risk groups, in particular, Aboriginal children, children in low-income families, and **Children and Youth in Care**.*
- *Continue to improve provincial information about Aboriginal children, **Children and Youth in Care**, and other vulnerable groups of children. Data definitions and categories should be compatible with other systems designed to track health and disease in the total child population.*
- *The Ministry for Children and Families should develop data and information systems to track health outcomes, including hospitalizations and deaths, for all **children who are or have been in-care**.*

Later in a Special Report in 2001, entitled "*Health Status of Children and Youth in Care in British Columbia: What do the Mortality Data Show?*", the Provincial Health Officer, in cooperation with the Ministry of Children and Families, the Children's Commission, and the B.C. Vital Statistics Agency, published a detailed study of the pattern and trend of deaths to CYIC in B.C.

That report and accompanying technical document acknowledged that, while not a measure of health per se, the causes and rates of mortality (death) provides an indication of the health problems and risk conditions experienced by CYIC. Results showed an encouraging trend over time, with death rates declining among all groups of children and youth, including those in care.

Over that study period, those in care had an average annual death rate of 22.5 per 10,000 children, compared to the provincial rate of 6 per 10,000.

The likelihood of death for those in care relative to the general population, was about four to one. About 30 per cent of the in-care deaths were due to congenital anomalies, nervous system diseases, and childhood cancer – conditions that have not been highly amenable to prevention. However, progress is being made with some conditions as evidenced by the recent finding that folic acid supplementation before and during pregnancy can reduce the risk of spina bifida.

The analysis in the 2001 Special Report confirmed what was known at that time and which is still true; that as a group, CYIC face a greater risk of death, either because of medical conditions they were born with, their early childhood circumstances, or other problems that caused them to come into care. As a result of these pre-existing conditions, their average life expectancy will be shorter than that of children and youth in the general population.

An important purpose of the 2001 Special Report was to establish a set of baseline data against which to evaluate further progress in reducing child and

youth mortality in B.C. To use and improve upon the data presented in the report, the following recommendations were made:

- *Establish an ongoing means to produce death rates for children and youth in care and to compare them with the provincial child population.*
- *Establish a minimum data set for analysis of child and youth deaths. This should include age, gender, Aboriginal status, and if feasible, standardized coding of functional status and medical conditions.*
- *Adopt the Technical Report's recommendations regarding age-standardization, the denominator to be used in rate calculations, and the use of calendar years as the time periods for analysis.*
- *Assess the feasibility of applying this epidemiological approach to the monitoring and analysis of other child health outcomes, such as those shown in the table below:*

Information about Children and Youth in Care		
Children and Youth	In-Care Experience	Examples of Outcomes
Children and youth in care <ul style="list-style-type: none"> ● Age ● Gender ● Birth weight ● Gestational age ● Ethnicity (Aboriginal) ● Disability status* ● Health conditions, e.g., Fetal Alcohol Syndrome ● Location of residence ● Family background ● Socioeconomic status of family and neighbourhood 	<ul style="list-style-type: none"> ● Age when coming into care ● Reason for coming into care ● Services/treatments provided ● Setting, e.g., foster care, group home, residential ● Cultural placement matching ● Length of time in care ● Number of placement changes ● Reason for discharge 	Growth and development <ul style="list-style-type: none"> ● Physical growth and nutritional status ● Motor and social development ● Language and cognitive development ● Emotional maturity Safety and security <ul style="list-style-type: none"> ● Abuse and maltreatment ● Critical injuries Learning <ul style="list-style-type: none"> ● School readiness ● Attitudes toward learning ● Assessment scores ● Grade to grade transition ● School completion Social engagement and responsibility <ul style="list-style-type: none"> ● Connections with family and school ● Community involvement ● Contacts with criminal justice system Health behaviours <ul style="list-style-type: none"> ● Tobacco, alcohol, drug use ● Physical activity ● Safety practices Health problems <ul style="list-style-type: none"> ● Illness episodes, e.g., hospitalizations ● Emotional and behavioural problems Death <ul style="list-style-type: none"> ● Cause ● Preventability (from death review)
Comparison groups <ul style="list-style-type: none"> ● B.C. population age 0-18 ● Status Indians age 0-18 		
* Previous data no longer available. The information in italics was the most readily available, and accordingly was used in this study.		

This current study builds on the baseline of information from the 2001 Special Report, updating that information using a similar methodology, and incorporating an additional five years of data.

Summary

Comparisons of CYIC with the B.C. Child Population

- The proportion of CYIC as a percentage of the provincial child population has changed over time, ranging from 0.86% in 1986, declining to 0.67% in 1993, then rising to 1.08% by 2001, and finally decreasing to about 1.00% over the last 3 years.
 - The CYIC population differs from the provincial child population in age composition, with relatively fewer younger children (ages 0-4) and more older children (ages 15-18 years).
 - The mortality rates of CYIC were significantly higher than those of the provincial child population in all age groups and both genders for All Causes of death, and for both Natural and External Causes.
 - There were statistically significant differences in All Causes mortality between age groups in the CYIC population, highest in ages 0-4 years, and lowest in ages 5-14 years. This pattern of mortality was similar to (but greater than) rates for the provincial child population.
 - There was a statistically significant higher mortality for CYIC aged 0-4 years for Natural Causes and for ages 15-18 years for External Causes, as compared to CYIC in other age groups. This pattern was similar to that of the provincial child population, although with higher rates for CYIC.
 - There were no statistically significant mortality differences between CYIC males and females by age group or by All Causes, Natural Causes, or External Causes.
 - Aboriginal children are over-represented in the CYIC caseload (46% in 2001-2005) relative to the provincial child population (about 7% in 2001).*
 - Aboriginal children in the CYIC caseload proportionally exceeded non-Aboriginals for ages 0-4 and 5-14 years, but were proportionately less for ages 15-18 years.
 - The cumulative All Causes, Natural Causes, and External Causes mortality differences between Aboriginal and Non-Aboriginal CYIC were not statistically significant.
- Major comparative data are summarized in Tables 1 and 2 below.

Table 1: Comparative Demographic Characteristics, CYIC and Provincial Child Population, B.C., 2001-2005

Characteristic	Per Cent of Individuals	
	CYIC	B.C. Child Population
Age		
0-4	16.9	22.4
5-14	52.0	53.8
15-18	31.1	23.9
Gender		
Male	53.0	51.4
Female	47.0	48.6
Ethnicity*		
Aboriginal	45.9	7.1
Non-Aboriginal	54.1	92.9

* The ethnicity characteristic "Aboriginal" in the B.C. child population refers to people aged 0-17 years identified as Aboriginal in the 2001 Census, accessed through BC STATS. For CYIC, Aboriginal means a child who is recorded as being Aboriginal in the Ministry for Children and Family Development information system.

Table 2: Comparative Mortality Experience, CYIC and Provincial Child Population, B.C., 1986-2005

Characteristic or Indicator	CYIC		B.C. Child Population Rate**	CYIC / B.C. Child Rate Ratio
	Deaths	Rate*		
Age				
0-4	111	42.1	13.0	3.2
5-14	68	9.1	1.5	6.1
15-18	102	17.9	5.3	3.4
Total	281	19.8	5.3	3.7
Ethnicity***				
Aboriginal	40	13.2	N/A	N/A
Non-Aboriginal	73	15.9	N/A	N/A
Total	113	14.9	4.0	3.7
Gender				
Male	156	21.0	6.2	3.4
Female	125	18.8	4.4	4.2
Total	281	19.8	5.3	3.7
Cause of Death				
Natural Causes	180	15.7	3.8	4.2
External Causes	101	4.9	1.6	3.1
Total****	281	19.8	5.3	3.7

* All CYIC rates are Age-Standardized (Indirect Per 10,000), except for age group (Age-Specific Rates Per 10,000).

** Except for Age-Specific Rates, all rates for B.C. Child Population are Age-Standardized (Direct) Rates Per 10,000.

*** For CYIC, Aboriginal means a child who is recorded as being Aboriginal in the Ministry for Children and Family Development information system, or additionally for deaths, the child was recorded as being a Status Indian by B.C. Vital Statistics Agency. CYIC and B.C. child data are for 1997-2005 only.

**** As the CYIC rates are indirectly standardized, the total is not the exact sum of both groups of causes.

* Note that definitions of Aboriginal Status are different (see footnote to Table 1).

Time Trend of CYIC Mortality

- The annual age-standardized mortality rate trend for All Causes showed significant declines for CYIC males, females, and both genders combined.
- The age-standardized mortality rate trend also declined for Aboriginal CYIC (but not non-Aboriginal CYIC). However, data by ethnic status were only available for the 9-year period 1997 to 2005, which may be insufficient time to fully understand potential differences by Aboriginal status.
- Natural Causes and External Causes age-standardized mortality rates also showed significant declines for CYIC as a whole.
- All Causes age-standardized mortality rates showed a significant declining trend for ages 0-4 years, but there was no significant changing trend for ages 5-14 or 15-18 years. The overall decreasing mortality trend was primarily due to a reduction in mortality for ages 0-4 years, particularly in Natural Causes.
- The annual trend in All Causes Standardized Mortality Ratios for CYIC as a whole showed no significant change over time. Thus, while CYIC mortality rates have declined over time, as have rates for the provincial child population, the relative gap between CYIC and the provincial child population has persisted, because CYIC are a high-risk group of children.

The mortality indicator time trends are summarized in Table 3 for those indicators with sufficient data for statistical testing.

Table 3: Summary of Mortality Trend Indicators for CYIC, B.C., 1986 to 2005

Group	Causes of Death	Mortality Indicator	Trend	p Value*
Total	All Causes	Age-Standardized Rate	decreasing	<0.001*
Total	Natural Causes	Age-Standardized Rate	decreasing	0.001*
Total	External Causes	Age-Standardized Rate	decreasing	0.003*
0-4 years	All Causes	Age-Specific Rate	decreasing	0.001*
5-14 years	All Causes	Age-Specific Rate	no change	0.140
15-18 years	All Causes	Age-Specific Rate	no change	0.097
Male	All Causes	Age-Standardized Rate	decreasing	0.009*
Female	All Causes	Age-Standardized Rate	decreasing	0.049*
Aboriginal**	All Causes	Age-Standardized Rate	decreasing	0.002*
Non-Aboriginal**	All Causes	Age-Standardized Rate	no change	0.817
Total	All Causes	Annual Standardized Mortality Ratios	no change	0.488

* Log Linear Regression Analysis, significant at $p \leq 0.05$.

** Aboriginal and Non-Aboriginal data are for 1997 to 2005.

The Leading Causes of Death for CYIC

Data showing the Leading Causes of CYIC death are summarized in Table 4 below, in descending order of frequency. Each of these causes in CYIC had significantly higher rates than the provincial child population average. The client characteristics of age, gender, and ethnic status are listed for the Leading Causes, and also for deaths by Natural, External, and All Causes.

Table 4: The Leading Causes of Death for CYIC, Summary of Client Characteristics Associated with Significantly Higher Mortality Rates, B.C., 1986-2005

Leading Causes of Death		Age Group*	All Ages	
Rank Order	Number of Deaths		Gender	Ethnic Status***
1	Congenital Anomalies	52	0-4	
2	SIDS	37	0-4 (Infants)	
3	Suicide	27	15-18	
4	Diseases of the Nervous System	25	NS	
5	Motor and Unspecified Vehicle Accidents	24	15-18**	
6	Accidental Poisoning	12	15-18	NS
7	Diseases of the Respiratory System	10	NS	NS
8	Homicide	10	NS	
9	Other Transport Accidents	10	15-18**	
10	Infectious Diseases	7	NS	
Natural Causes		180	0-4	
External Causes		101	15-18	NS
All Causes		281	0-4	NS

Note: NS means differences were not statistically significant, $p \leq 0.05$.

* Mortality difference was statistically significant (95% Confidence Intervals), or the only age group affected.

** For these causes, ages 15-18 is significantly higher than ages 5-14 only.

*** Data for 1997 to 2005 only.

For comparisons by age group, ages 0-4 had the highest mortality for Congenital Anomalies, SIDS (by definition a condition of infancy), All Causes, and Natural Causes. Ages 15-18 had the highest mortality for Suicide, Motor and Unspecified Vehicle Accidents, Other Transport Accidents, and External Causes.

For CYIC gender comparisons, none of the differences were statistically significant. Similarly, none of the differences for CYIC by Aboriginal or non-Aboriginal ethnic status were statistically significant.*

* In the case of Homicide, only a single non-Aboriginal CYIC death was recorded for this cause (insufficient data for analysis), although some cases temporarily listed as unknown cause are still under investigation by the Coroner. Depending on the outcome of such investigations, additional Homicide cases (which could be Aboriginal) may be added in the future.

Methodology and Limitations

Methods

The child and youth clients of the Ministry of Children and Family Development (MCFD) can be placed into two basic groupings: either children and youth in care (CYIC) or family support (FS) clients. The CYIC group is under the full responsibility of MCFD, which provides substitute parenting for individual children (the clients), when they are unable to live with their families. The FS group includes whole families (the clients), who receive various supportive services from MCFD, while the children continue to live with their family under full parental/guardian responsibility.

This mortality review focused only on the CYIC clients of MCFD, for whom MCFD was fully responsible as substitute parent/guardian, and updates data previously published in "*Children and Youth in Care: An Epidemiological Review of Mortality, British Columbia*", May 2001, by the Provincial Health Officer. A challenge for the study was the fact that CYIC are not a uniform group of children with the same characteristics and risks.

While some children were in care through an agreement with their parents, the majority were in care as the result of a court order. These children and youth were in the care and guardianship of MCFD for a variety of reasons which pre-date admission to the CYIC program, including: being severely disabled, having a chronic medical condition, or experiencing psychological trauma. In addition, many have also been living in socio-economically disadvantaged circumstances.

Many CYIC are of Aboriginal heritage, hence this review attempted to take these particular client characteristics into consideration, as well as gender and age. The study involved an analysis of mortality statistics only, and did not include individual client health status, personal circumstances, or health service utilization.

An epidemiological study of mortality comparisons requires the determination of a case definition and the population at risk, to obtain both numerator and denominator. In accordance with the intended focus of the project, the case definition (numerator) was defined as "any CYIC whose reason for discharge from care was recorded as being deceased". Outside the scope of this study were any child deaths which may have occurred either before admission to or after discharge from the CYIC program.

A previous assessment of the validity and reliability of the CYIC caseload statistics concluded that month-end CYIC caseload statistics provided a satisfactory estimate of person-years in care. Thus, the population at risk (denominator) was defined as "the number of individuals recorded in the MCFD information system as being in the current CYIC caseload as of December 31st in each year".

Mortality comparisons were made between CYIC and the provincial child population, taking age and gender into consideration. The mortality of CYIC was assessed by age-standardizing, but due to small numbers, the indirect method* was used for calculating rates. Standardized Mortality Ratios (SMRs) over the 20-year time period from 1986 to 2005 were used for specific causes of death. The mortality trend for the B.C. child population was assessed with age-standardized rates using the direct method.

Age-Specific rates and age-standardization calculations were based primarily on age groups 0-4, 5-14,** and 15-18 years, as there were very few deaths in some cells if smaller age groupings were used. The only exceptions were SMR calculations for SIDS and Perinatal Causes, which used age group <1 year. The 1991 B.C. child population was used as the standard population for all age-standardization calculations. Statistical tests for trends and differences are described where used in the paper.

* R. Anderson and H. Rosenberg, "Age Standardization of Death Rates: Implementation of the Year 2000 Standard", *National Vital Statistics Reports*, Vol. 47, No. 3, October 7, 1998: 13. The indirect method is preferred for rates based on small numbers as it reduces the degree of annual fluctuation. The methodology used to calculate the indirect standardized rate involved taking the ratio of observed to expected deaths (SMR) for CYIC for a given year, and multiplying by the crude mortality rate for the standard population.

** Ages 5-9 and 10-14 years were combined due to the very few deaths in these age groups.

Data Sources

The information presented in this report was derived from operational databases and files maintained by MCFD and provided to the B.C. Vital Statistics Agency (BCVSA). Access to the names of individual CYIC and their records was limited to the staff of those agencies whose usual duties involved working with such confidential information. Other than the project team member with ongoing authorized access to identified Vital Statistics data, the other members of the project team worked with linked non-identified data provided by those agency staff.

Data on CYIC deaths and caseloads were compiled for the time periods 1986 to 2005. For this 20-year period, detailed CYIC caseload data were available, including age, gender, and Aboriginal status. Mortality data on the provincial child populations were provided by BCVSA from the provincial mortality database by calendar-year. Provincial population estimates (as of July 1) were based on the national Census for Census years, and as estimated by BC STATS of the Ministry of Finance and Corporate Relations for inter-Census years.

Individual CYIC from 1986 to 2005 who were recorded as dying while in care were identified in the MCFD electronic information system by MCFD staff and provided to BCVSA. The list of deceased CYIC from MCFD was matched to individual death certificates by BCVSA staff, to obtain the officially recorded date and cause of death. This process identified a total of 281 CYIC who died while in care over the 20-year period 1986 to 2005, of whom three lacked a death certificate in BCVSA.

Further consultation with MCFD staff determined that one individual had died in Alberta due to external causes, while the other two had died in Ontario due to natural causes, all while temporarily outside of B.C.* The deaths were registered in the jurisdiction of occurrence, however, the MCFD master files contained sufficient information about these cases for the purposes of this analysis, to enable two of the deaths to be assigned probable specific causes, with the other death being considered as an unknown natural cause.

* Because of privacy considerations, no further details about these cases are included in this report.

Limitations

It is important to acknowledge certain important limitations in this study of mortality in CYIC:

(1) For the period 1986 to 2005, with the three exceptions as described above, the underlying cause of death was taken as recorded in the BCVSA mortality registry.* These data are subject to the agency's internal review process for consistency in coding practice and routine updating, including the use of information from coronor's reports. There was no additional attempt by the project team to verify the accuracy of the medical diagnosis, however, the recorded diagnosis of the cause of death is believed to be adequate for the purposes of this study.

(2) While it is possible that some CYIC deaths may not have been recorded in MCFD paper files or the electronic information system, given the improvements in their information system in recent years, the theoretical possibility of the unrecording of CYIC deaths is believed to be an unlikely source of significant error in this study.

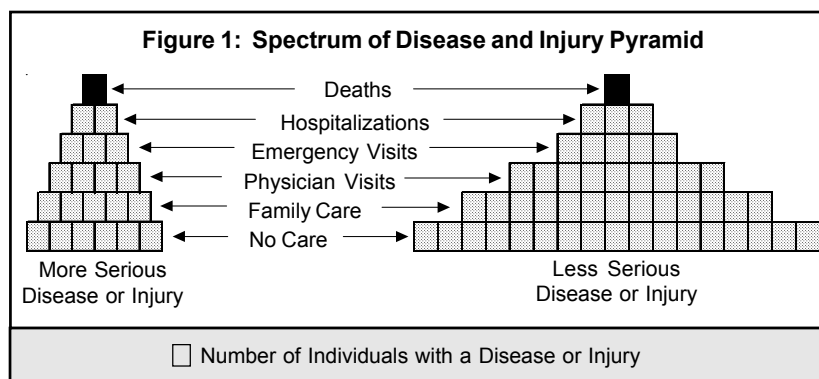
(3) The CYIC caseload consists primarily of children who by legislation become clients because there was reason to believe that they were at risk. Currently, CYIC comprise approximately 1% of the provincial child population, but this proportion has varied between 0.67% and 1.08% over the last 20 years. If for any reason there has been a change in the underlying "risk mix" of CYIC over time, that difference could influence the mortality rate and consequent assessment of the mortality trend over

time. Hence, caution is needed in interpreting any apparent trends over time.

(4) The health status of a population (or a group such as CYIC) cannot be completely described by an analysis of mortality alone. Those individuals dying of a condition are usually less numerous than, and not necessarily representative of, all individuals with the condition, as is illustrated by the pyramid model below (see Figure 1). The size of the base of the pyramid is indirectly related to the seriousness of the health problem as a cause of death. As mortality represents the tip of the iceberg, any detailed analysis of health status should also include hospitalization, medical care, and prescription drugs, data which were not within the scope of this analysis.

(5) Since an epidemiological comparison of CYIC with a similar group of children who are not CYIC was not possible in this study, the only comparison which could be made was with the general provincial child population, taking age and gender into consideration. Thus, the mortality comparisons in this study provide an estimate of the degree of the mortality gap between CYIC and the provincial child population. However, this does not imply that it should be or could be possible for the mortality of CYIC to be similar to the mortality of the general child population, as children become CYIC specifically because they are at-risk and require the type of care available in this program.

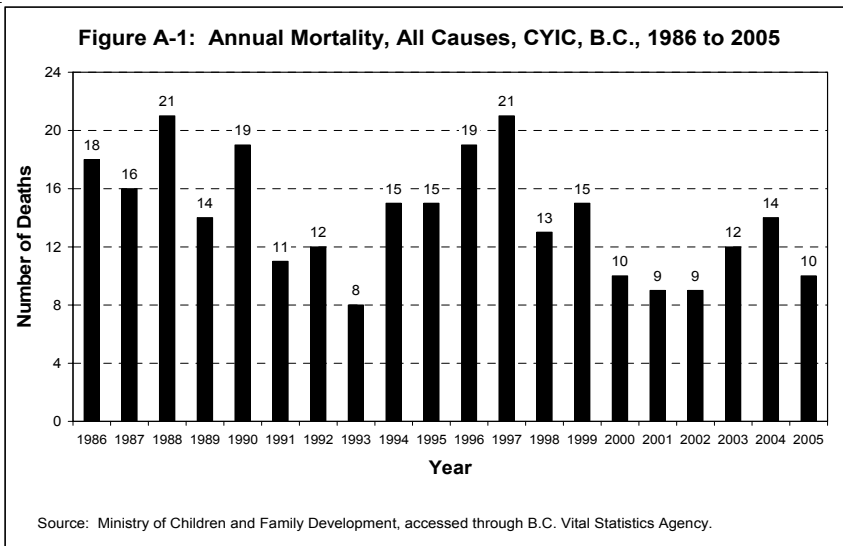
The next sections contain the study findings.



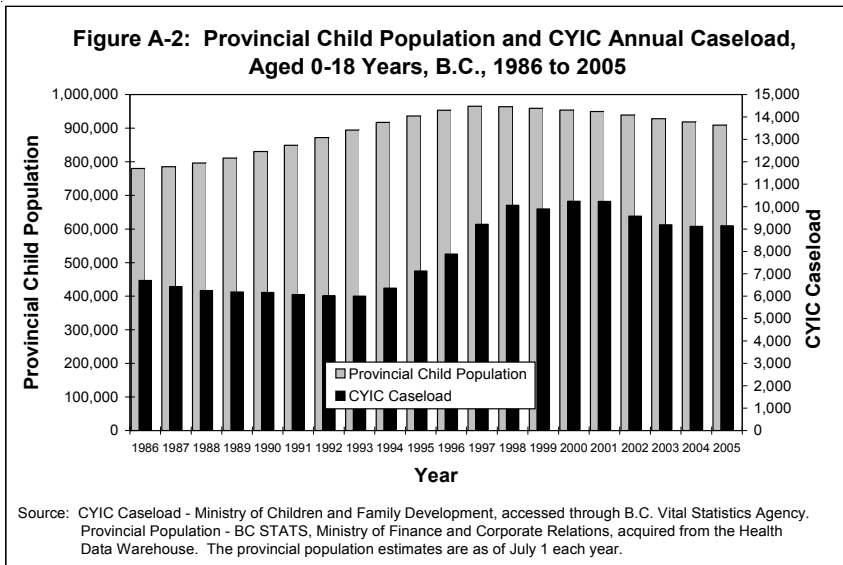
* The underlying cause of death is (a) the disease or injury which initiated the train of morbid events leading directly to death, or (b) the circumstances of the accident or violence which produced the fatal injury. WHO, ICD 1993, 10th Revision, Vol 2: 31.

The Long Term Mortality Trend

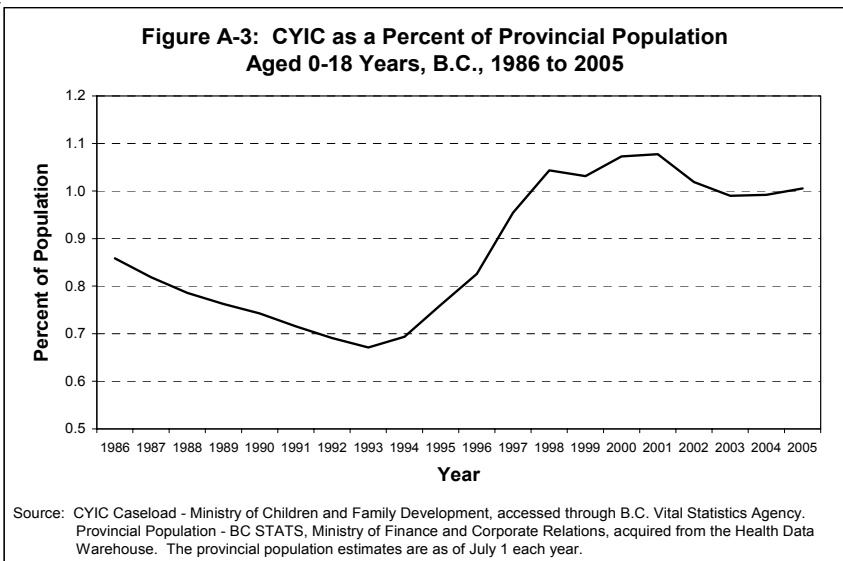
The annual number of deceased CYIC during the 20-year period 1986 to 2005 is shown in Figure A-1. The pattern is characterized by considerable annual fluctuation, as occurs with rare events. The number of deaths ranged from 8 in 1993 to 21 in 1988 and 1997. There were 281 deaths during this period (about 14 per year on average).



In assessing the mortality trend, it should be noted that the annual CYIC caseload has changed over time. Using approximate numbers, the caseload* declined slightly from 6,700 cases in 1986 to 6,000 in 1993, then increased to 10,000 in the late 1990s before decreasing slightly to 9,000 over the last 3 years (see Figure A-2). Putting this change into context, the provincial child population gradually increased to a peak of 965,000 by 1997, declining to 909,000 by 2005.



Over this 20-year period, the CYIC caseload as a proportion of the B.C. child population has varied considerably. The CYIC caseload comprised 0.86% of the provincial child population in 1986, declined to 0.67% in 1993, rose to 1.08% by 2001, then gradually decreased to around 1% for the last 3 years (see Figure A-3).



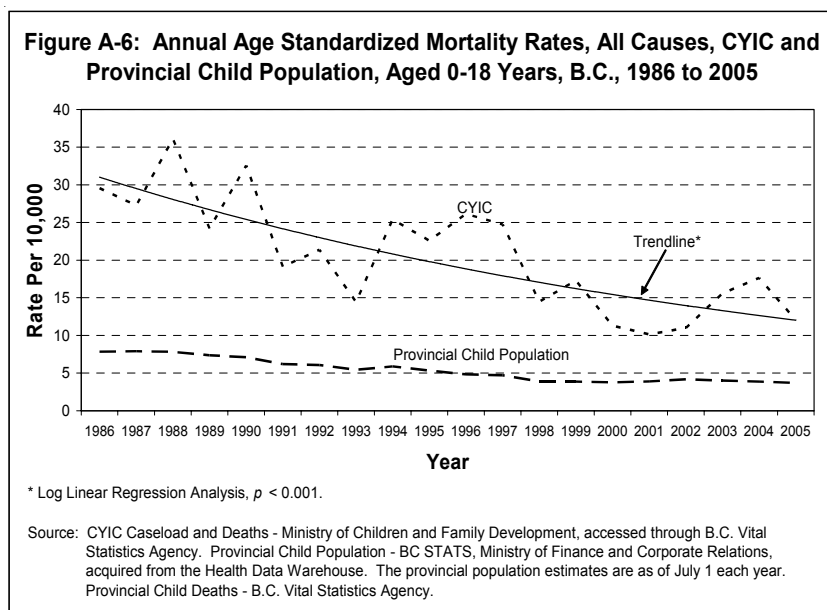
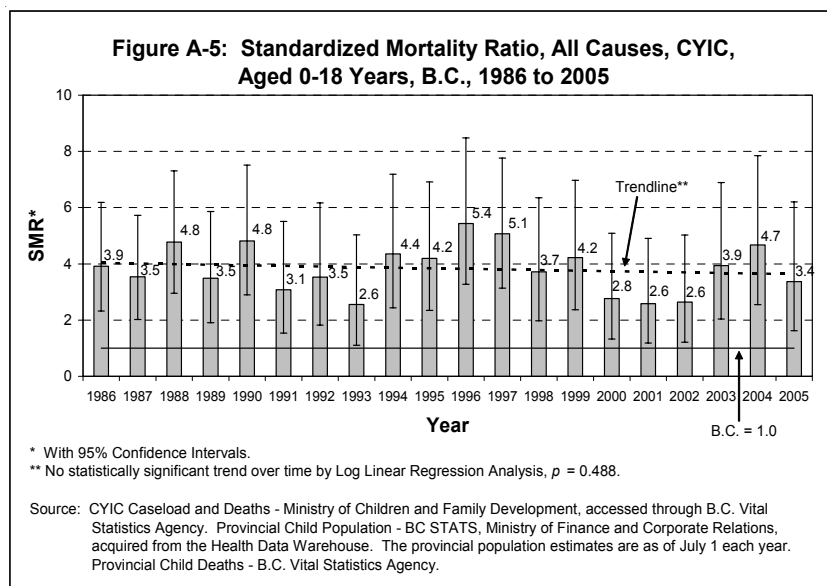
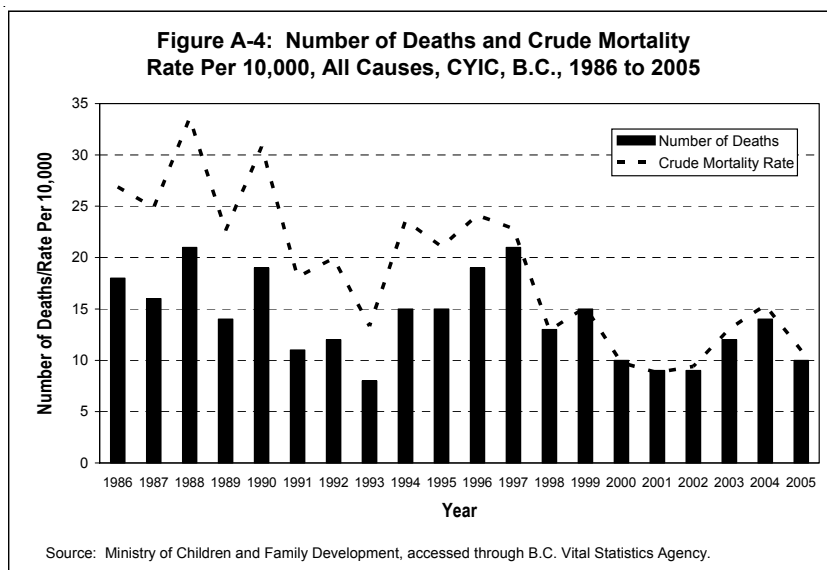
* Counted as the number of CYIC as recorded on December 31.

The crude mortality rate (meaning the rate is not adjusted for age) for CYIC has demonstrated considerable annual fluctuation, as tends to occur with rare events. The rate fell by approximately 50% from the late 1980s to the early 2000s (see Figure A-4).

The relative difference in mortality between CYIC and the provincial child population as measured by the Standardized Mortality Ratio or SMR, has fluctuated over time with no statistically significant trend ($p = 0.488$) or annual differences (see Figure A-5). This shows that during this time of generally declining mortality, CYIC not unexpectedly always had a risk of dying that was about 3 to 5 times higher than the provincial child population.

The age standardizing of mortality rates allows CYIC mortality to be more accurately assessed over time, and to be compared with the B.C. child population. The time trend for the entire 20-year period was assessed with Log Linear Regression Analysis.

The mortality for all children, including CYIC, has significantly declined over time, with the CYIC mortality being substantially higher and showing more annual fluctuation than the provincial child population, (see Figure A-6 and Table 5).



The causes of death were categorized into:

- **Natural Causes** - deaths due to illness, whether of known or unknown cause*, and
- **External Causes** - deaths due to an injury-causing event, whether intentional or unintentional.

For Natural Causes the mortality rates for CYIC were higher than for the B.C. child population and showed more fluctuation, with a statistically significant declining trend for both groups ((see Figure A-7 and Table 5).

Similarly, for External Causes the CYIC mortality rates were also higher and fluctuated more than the B.C. child population, with a statistically significant declining trend for both groups (see Figure A-8 and Table 5).

Figure A-7: Annual Age Standardized Mortality Rates, Natural Causes, CYIC and Provincial Child Population, Aged 0-18 Years, B.C., 1986 to 2005

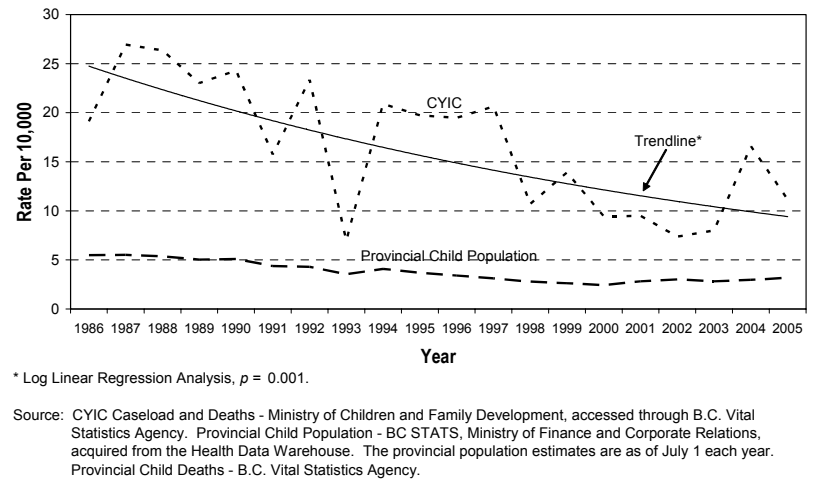


Figure A-8: Annual Age Standardized Mortality Rates, External Causes, CYIC and Provincial Child Population, Aged 0-18 Years, B.C., 1986 to 2005

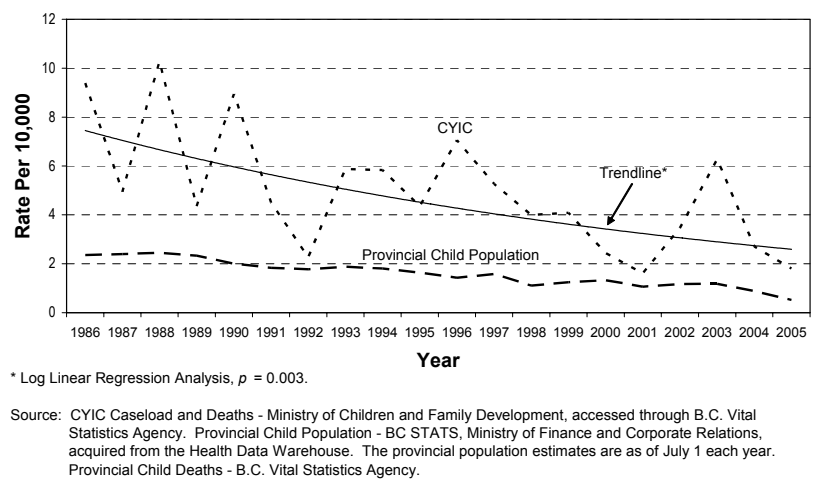


Table 5: Time Trends in Mortality, Natural, External, and All Causes, CYIC and Provincial Child Population, B.C., 1986-2005

Group	Cause of Death	Trend	p Value*
CYIC	Natural Causes		0.001
	External Causes	decreasing	0.003
	All Causes		<0.001
Provincial Child Population	Natural Causes		<0.001
	External Causes	decreasing	<0.001
	All Causes		<0.001

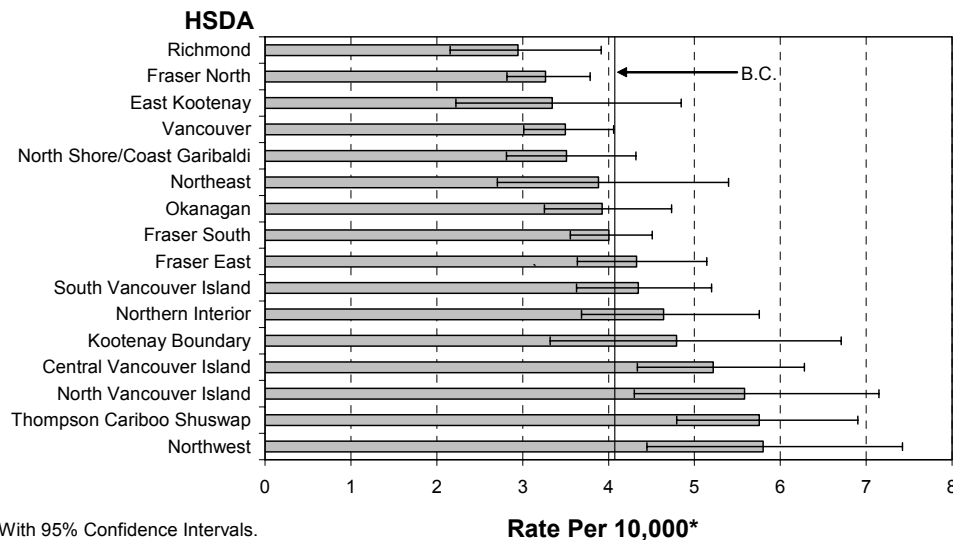
* Log Linear Regression Analysis.

* Deaths under investigation by the Coroner are temporarily included in this category pending the outcome of the investigation.

While sufficient long-term data were not available to assess regional differences in CYIC mortality, such data were available for the provincial child population (see Figure A-9). Cumulative mortality rates varied almost 2-fold between the lowest and highest regions. The lowest rates were found in Richmond and Fraser North, with the highest rates occurring in Central and North Vancouver Island, Thompson Cariboo Shuswap, and Northwest HSDAs. A future study could possibly explore the implications of this regional mortality pattern for CYIC, although such an analysis could be difficult due to a “small numbers” problem.

In summary, the mortality trend for CYIC as a whole has significantly decreased over the last 20 years, for All Causes, Natural Causes, and External Causes. As this declining trend has occurred against a background of decreasing mortality amongst the provincial child population, the relative mortality gap for CYIC has continued, with annual CYIC mortality rates persistently being about 3 to 4 times higher than for the B.C. child population. This reflects the fact that CYIC are an at-risk group within the overall child population, which is a continuing reality over time.

Figure A-9: All Causes, Cumulative Age Standardized Mortality Rates, Ages 0-18 Years, Provincial Child Population, by HSDA, B.C., 2001-2005



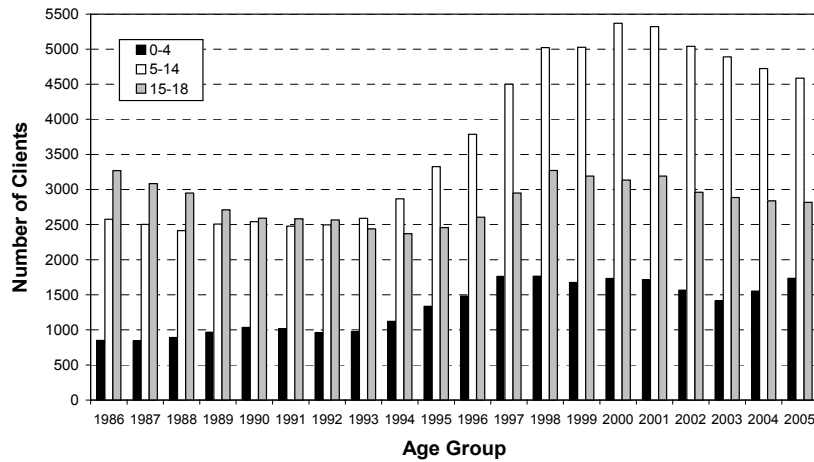
The Association Between Age and Mortality

As mortality risk is related to age, the changing age structure of CYIC was documented (see Figure B-1). The number of CYIC in age groups 0-4 and 5-14 years have approximately doubled over time, while ages 15-18 has fluctuated, with the number in 2005 being slightly lower than in 1986. The changing age structure, together with the different mortality risk by age, is adjusted for by age-standardizing the mortality rates.

On comparing the age structure of the CYIC and B.C. child population over the last 5 years (see Figure B-2), the CYIC population has proportionately more 15-18 year-olds and fewer 0-4 and 5-14 year-olds than the B.C. child population.

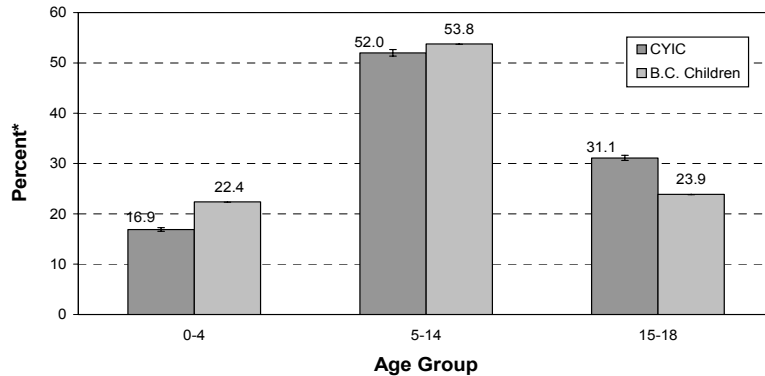
The number of deaths of CYIC by age group showed considerable annual fluctuation. The annual range of deaths was 1 to 13 for ages 0-4 years, 1 to 6 for ages 5-14 years, and 2 to 9 for ages 15-18 years (see Figure B-3).

Figure B-1: Annual Caseload, by Age Group, CYIC, B.C., 1986 to 2005



Source: Ministry of Children and Family Development, accessed through B.C. Vital Statistics Agency.

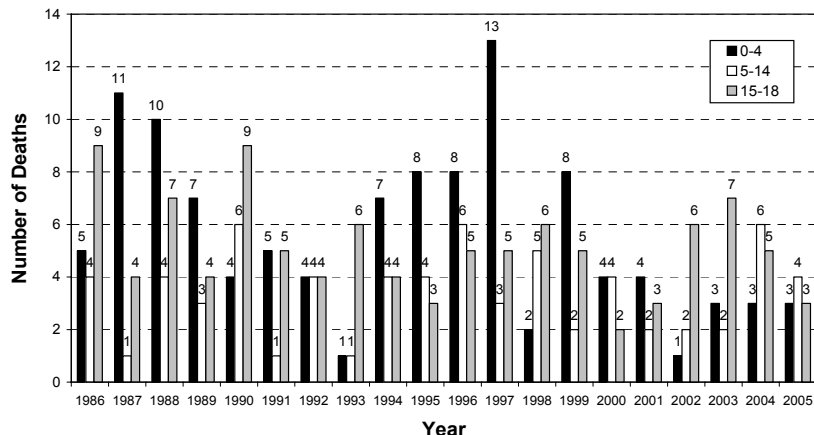
Figure B-2: Cumulative Population Proportions, by Age Group, CYIC and Provincial Child Population, B.C., 2001-2005



* With 95% Confidence Intervals.

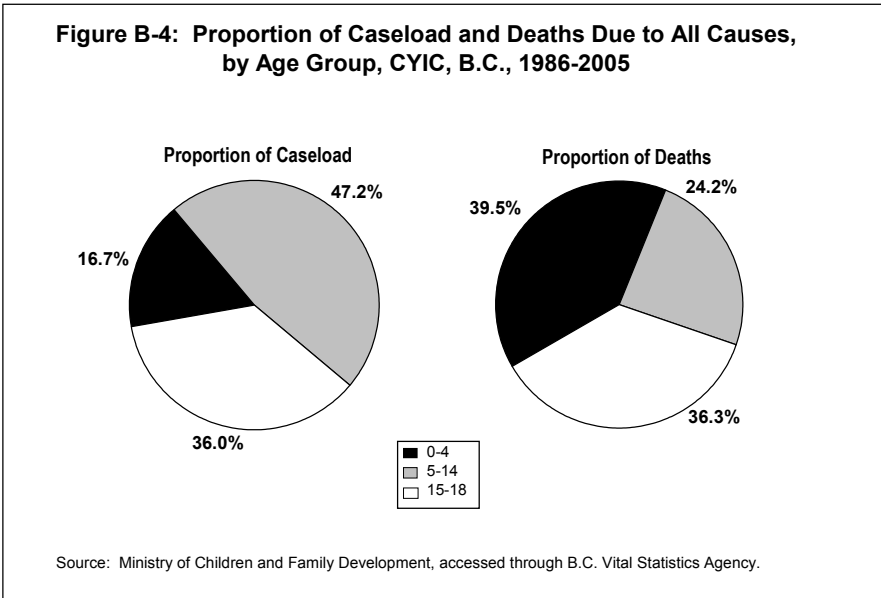
Source: CYIC Population - Ministry of Children and Family Development, accessed through B.C. Vital Statistics Agency. Provincial Populations - BC STATS, Ministry of Finance and Corporate Relations, acquired from the Health Data Warehouse. The provincial population estimates are as of July 1 each year.

Figure B-3: Annual Deaths due to All Causes, by Age Group, CYIC, B.C., 1986 to 2005

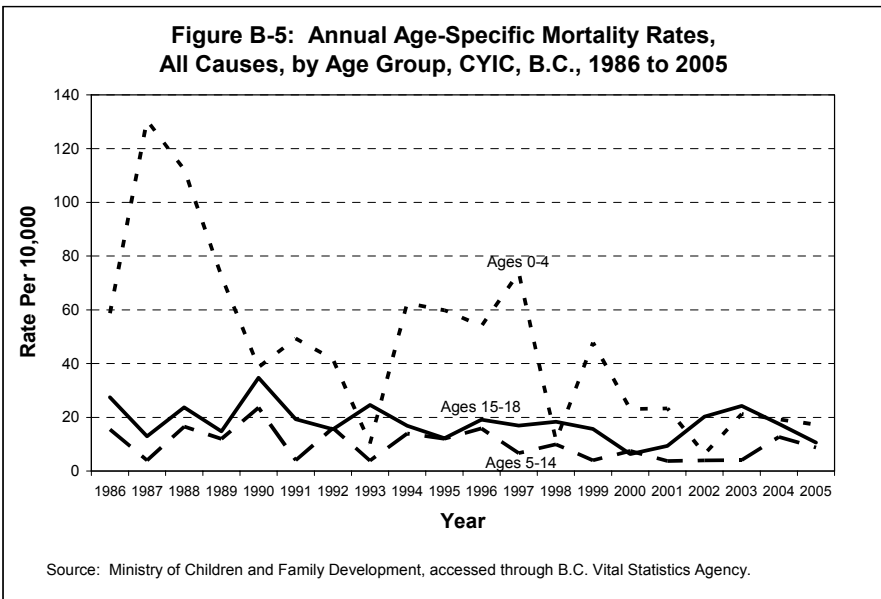


Source: CYIC Data - Ministry of Children and Family Development, accessed through B.C. Vital Statistics Agency.

Ages 0-4 years comprised the smallest proportion of the caseload (16.7%) and the largest proportion of the deaths (39.5%), whereas ages 5-14 years comprised the largest proportion of the caseload (47.2%) and the smallest proportion of the deaths (24.2%), as shown in Figure B-4.



The annual CYIC mortality rates showed a significantly declining trend for ages 0-4, however, ages 5-14 and 15-18 years showed no statistically significant change over time (see Figure B-5 and Table 6).



On further analysis (data not shown), it was determined that the decreasing mortality trend for ages 0-4 was primarily due to reductions in deaths due to Natural Causes.

Table 6: Significance of Time Trends, All Causes, Age-Specific Mortality Rates, CYIC, B.C., 1986-2005

Age Group	Trend	p Value*
0-4	decreasing	0.001
5-14	no change	0.140
15-18	no change	0.097
0-18**	decreasing	<0.001

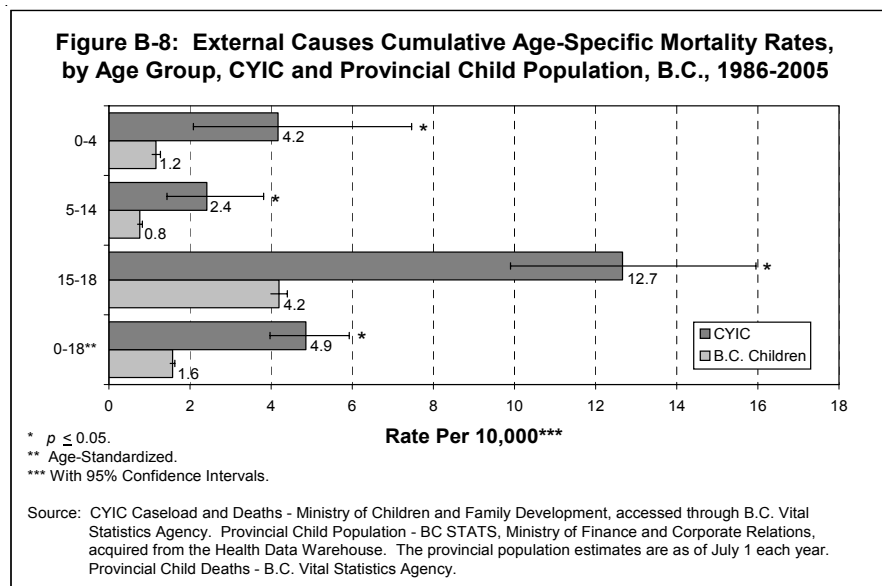
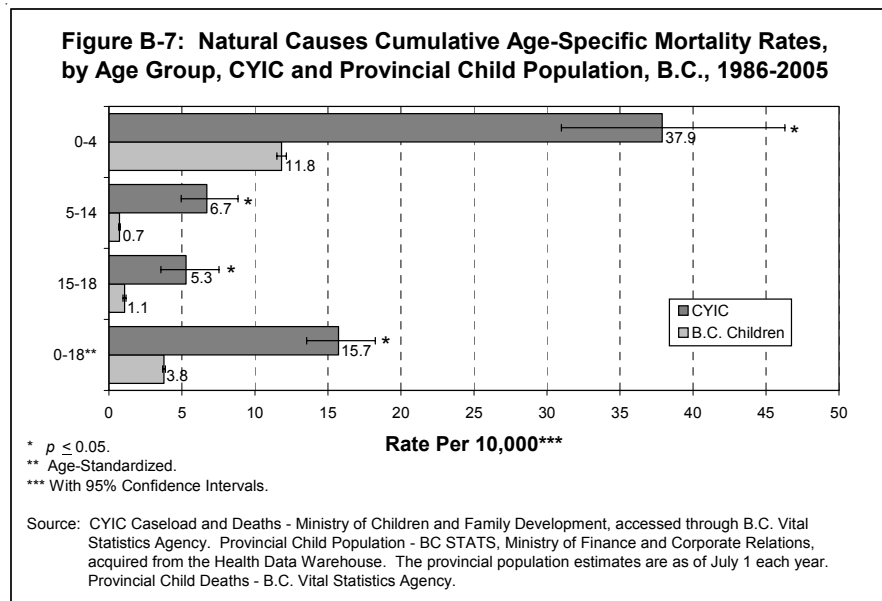
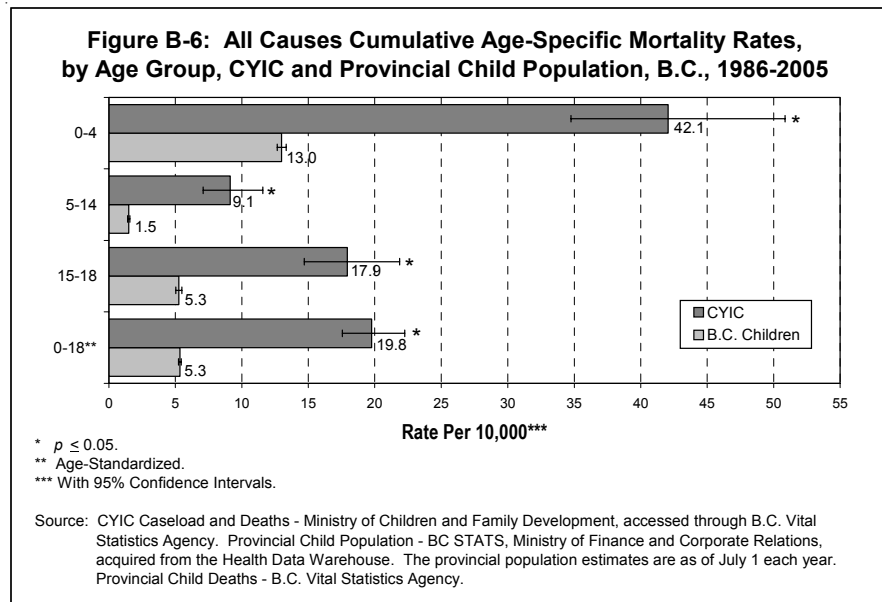
* Log Linear Regression Analysis.

** Age-Standardized.

On comparing the cumulative CYIC mortality by age group for the entire 20-year period, ages 0-4 years had the highest mortality rate, followed by ages 15-18 and 5-14 years. This overall pattern of age-specific CYIC mortality rates was similar to that of the provincial child population, however, the mortality rates for CYIC were significantly higher in all age groups, with the greatest relative disparity in ages 5-14 years (see Figure B-6).

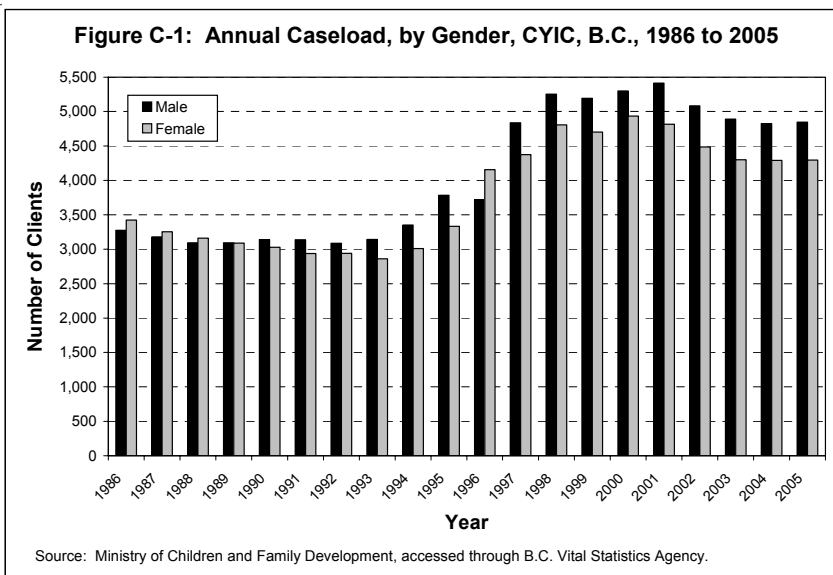
For Natural Causes, the CYIC mortality rates were highest for ages 0-4, followed by ages 5-14 and 15-18 years, with all being significantly higher than the provincial child population (see Figure B-7). For External Causes, the CYIC mortality rates were highest for ages 15-18, followed by ages 0-4 and 5-14 years, all being significantly higher than the provincial child population (see Figure B-8)

In summary, these data show that CYIC have a significantly higher mortality than the provincial child population for each age group and all categories of causes. The highest Natural Causes mortality was in ages 0-4 years, and the highest External Causes mortality was in ages 15-18 years, which in both cases were also significantly higher than the other CYIC age groups. The overall improvement in CYIC mortality over time was primarily attributable to a reduction in deaths to ages 0-4 years, particularly deaths due to Natural Causes.

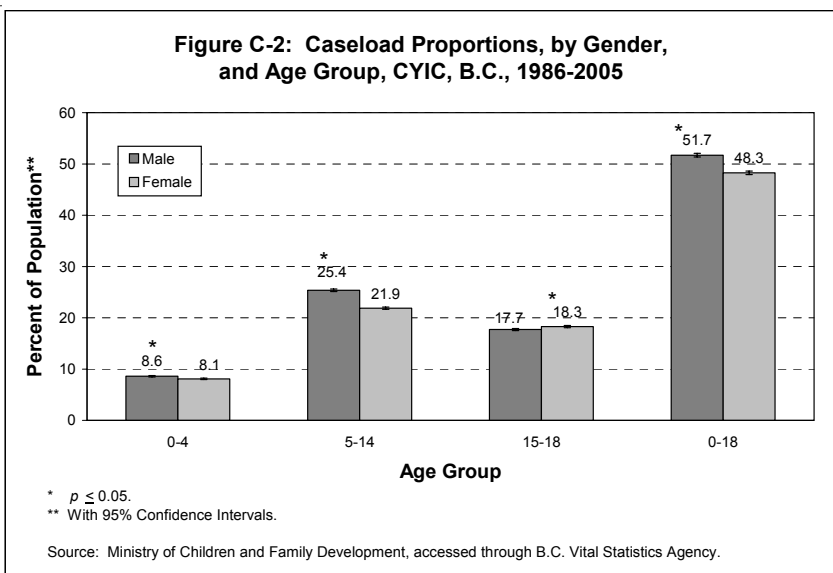


The Association Between Gender and Mortality

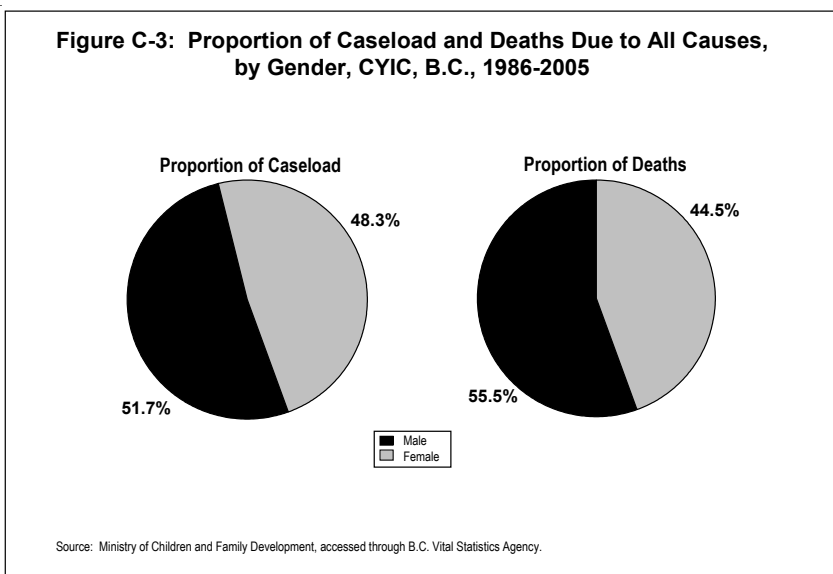
As with the provincial child population, the number of male CYIC has generally exceeded the number of females over time, with the exception of the late 1980s and 1996 (see Figure C-1). There is a similar pattern of a slight predominance of males in the B.C. child population (51.4% in 2005), although to a lesser extent than in CYIC (53.0% in 2005).



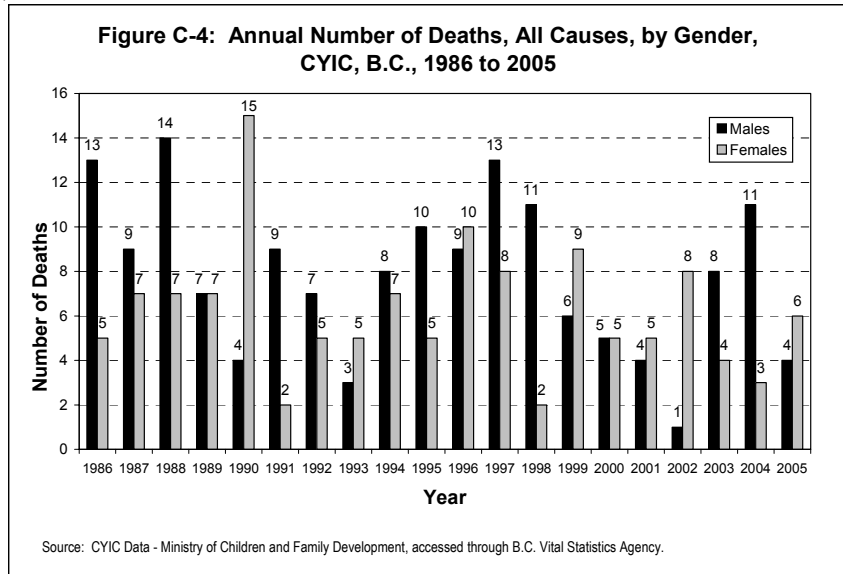
The proportion of male CYIC significantly exceeded females for ages 5-14 and 0-18 years, while the gender differences were quite minor for ages 0-4 and 15-18 years (see Figure C-2).



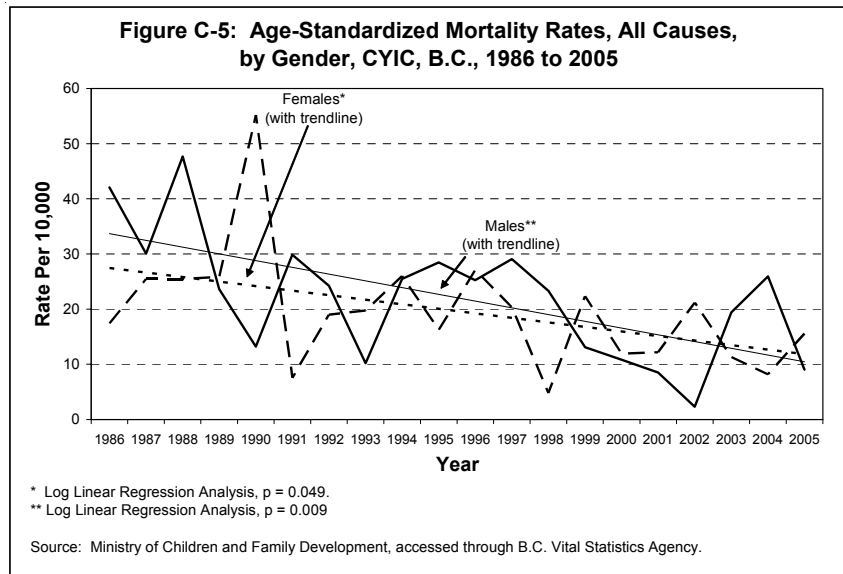
Relative to their proportion in the caseload (51.7%) over 20 years, males experienced a slightly higher proportion of the CYIC deaths (55.5%) than females (see Figure C-3).



The annual number of deaths of CYIC by gender are shown in Figure C-4, with the pattern for both males and females fluctuating due to small numbers. Male deaths ranged from 1 to 14 per year, with an annual average of about 8 deaths. Female deaths ranged from 2 to 15 per year, with an annual average of about 6 deaths.



For All Causes, the annual mortality rates by gender are shown in Figure C-5. There is considerable fluctuation in CYIC rates due to small numbers.



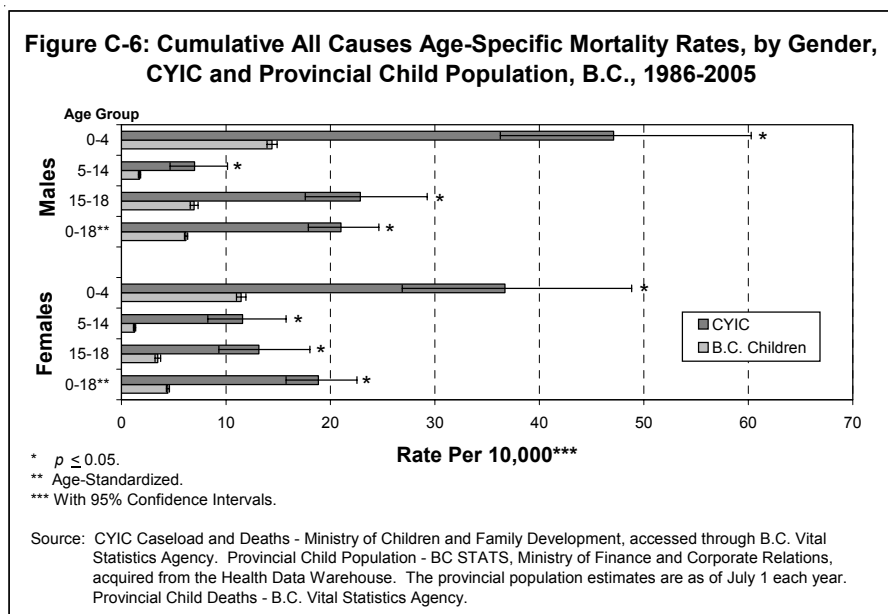
The declining mortality trend in both male and female CYIC was statistically significant (see Table 7).

Table 7: Statistical Significance of Time Trends, All Causes Age-Standardized Mortality Rates, by Gender, CYIC, B.C., 1986-2005

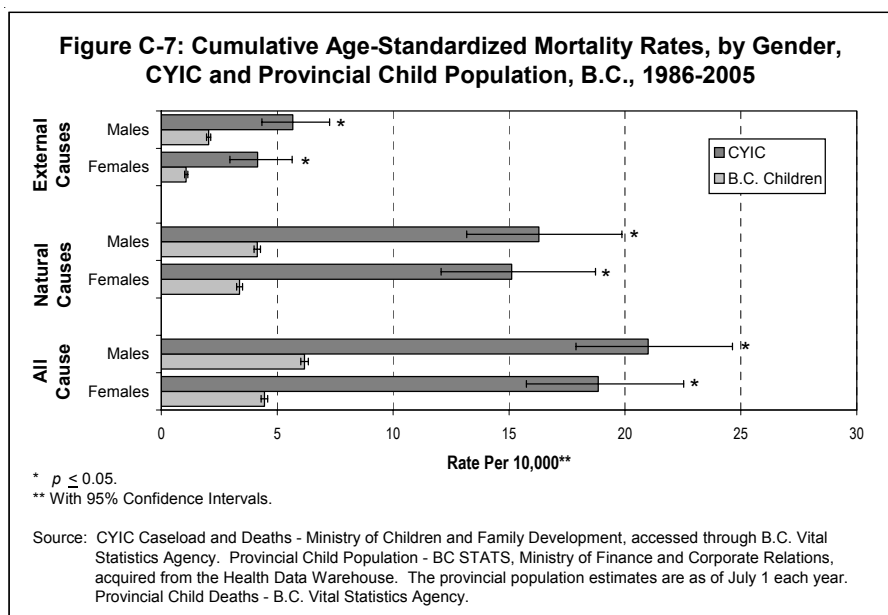
Gender	Trend	p Value*
Male	Decreasing	0.009
Female	Decreasing	0.049

* Log Linear Regression Analysis.

A comparison of CYIC with the B.C. child population using cumulative age-specific mortality rates by gender, showed that CYIC mortality was significantly higher than the provincial child population mortality in all age groups for both genders (see Figure C-6).



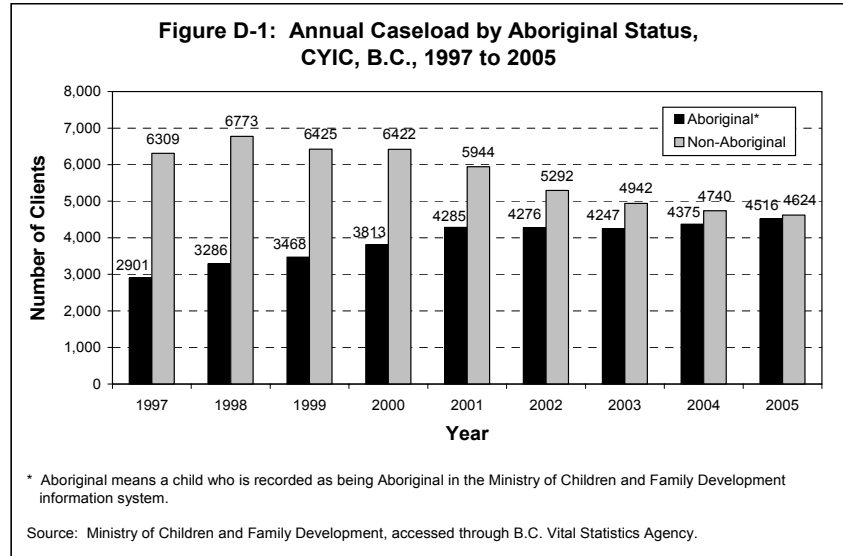
Mortality for both genders of CYIC was significantly higher than the B.C. child population for all categories of causes. Male mortality exceeded females for each category of causes for both CYIC and B.C. child population (see Figure C-7), although the gender differences within CYIC were not statistically significant.



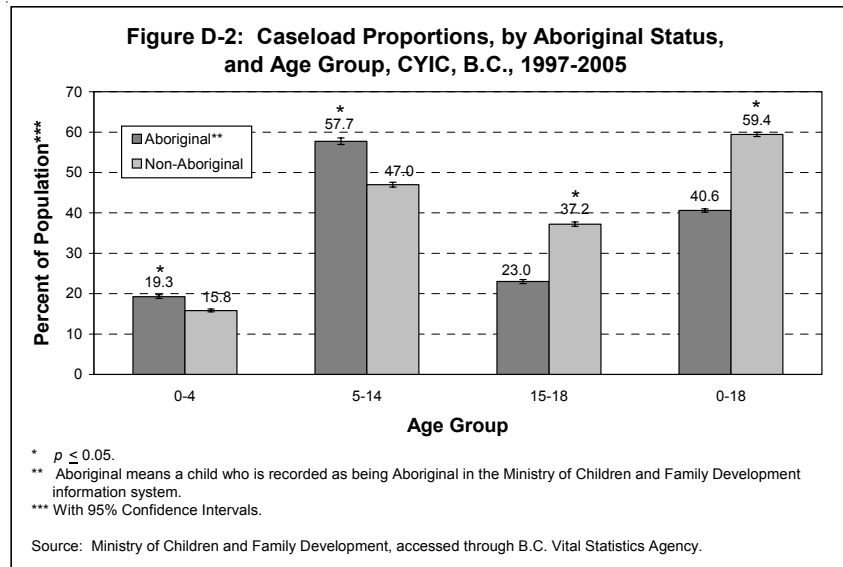
In summary, these data show that both genders of CYIC had a significantly higher mortality than the provincial child population for each age group and all categories of causes. Within CYIC, male and female mortality differences were not statistically significant. The mortality rates for both genders experienced significantly declining trends over the last 20 years.

The Association Between Aboriginal Status and Mortality

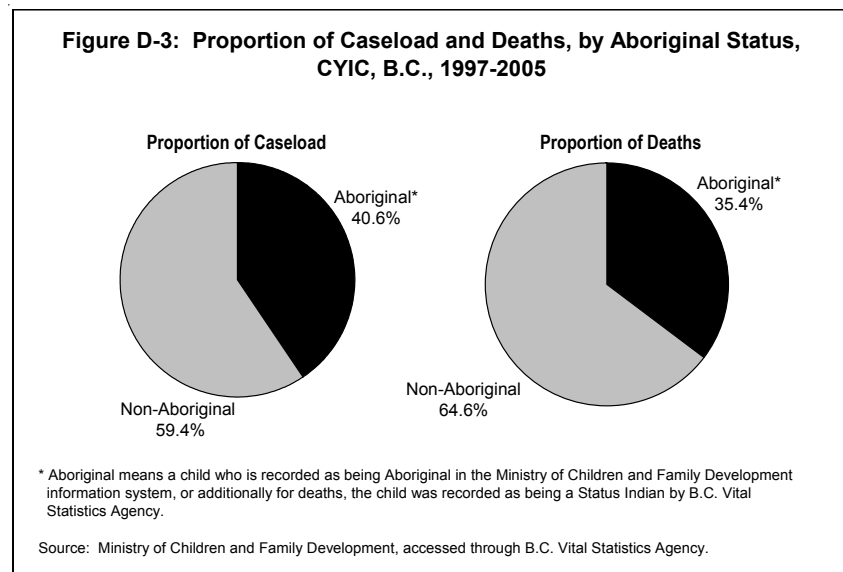
Aboriginal children comprise an increasing proportion of the CYIC caseload over time, from 31.5% in 1997 to 49.4% in 2005 (see Figure D-1 for actual year-end caseload counts), a statistically significant trend ($p < 0.001$).^{*} This compares with the 2001 census estimate of 7.1% of the age 0-17 years population of B.C. being of Aboriginal heritage (BC STATS).



Compared with Non-Aboriginal CYIC, Aboriginal CYIC had a caseload presence that was proportionately higher for ages 0-4 and 5-14 years, and lower for ages 15-18 years and all ages, with the differences being statistically significant (see Figure D-2).



Based on cumulative calendar year-end caseload counts over the entire period 1997-2005, Aboriginal CYIC comprised 40.6% of the caseload and experienced 35.4% of the deaths of CYIC (see Figure D-3).



^{*} Comparable data not available prior to 1997. Data are for number of children in the CYIC caseload as of December 31 in each year, which is an estimate for the number of person-years in care per year.

Deaths to Aboriginal CYIC ranged from 4 to 6 per year, averaging about 4 per year. Deaths to Non-Aboriginal CYIC ranged from 5 to 15 per year, averaging about 8 per year (see Figure D-4).

The annual mortality rates for Aboriginal CYIC showed a statistically declining trend, while the rates for Non-Aboriginal CYIC fluctuated with no significant trend, (see Figure D-5 and Table 8). It should be noted that these data by Aboriginal status are only available for 9 years, as compared to 20 years for the other data.

It is not clear from these data why the mortality trends differ in this way, i.e., whether Aboriginal and non-Aboriginal CYIC have had different or changing risks over time (the latter had a higher Natural Causes mortality, but not statistically significant), whether deceased Aboriginal CYIC are under-ascertained, whether the increasing proportion of Aboriginal children in the CYIC caseload is having an effect, or whether 9 years is an insufficient period to reliably assess trends based on small numbers.

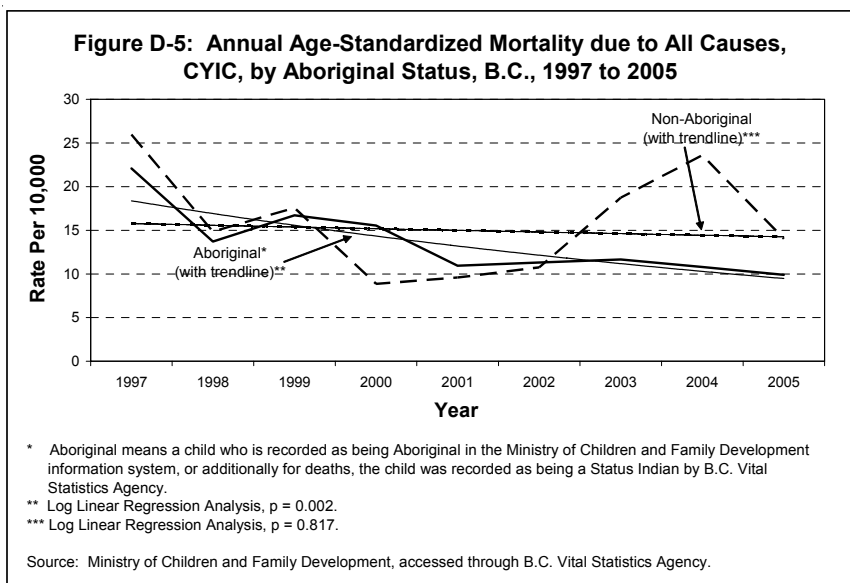
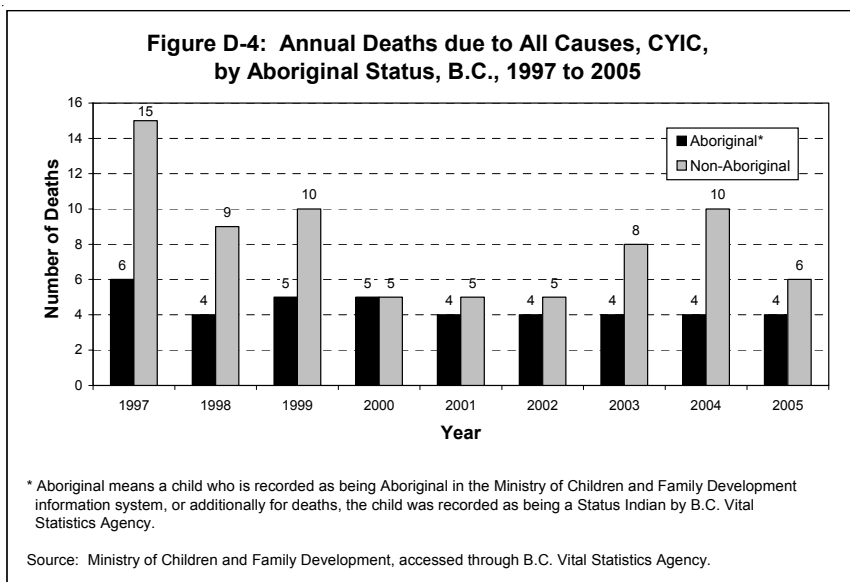


Table 8: Statistical Significance of Time Trends, All Causes Age-Standardized Mortality Rates, by Aboriginal Status, CYIC, B.C., 1997-2005

Aboriginal Status	Trend	p Value*
Aboriginal	Decreasing	0.002
Non-Aboriginal	No change	0.817

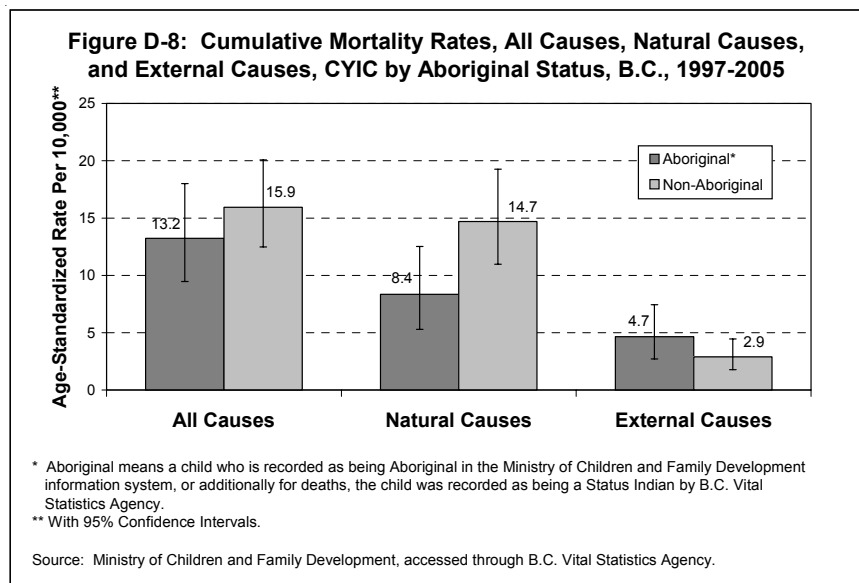
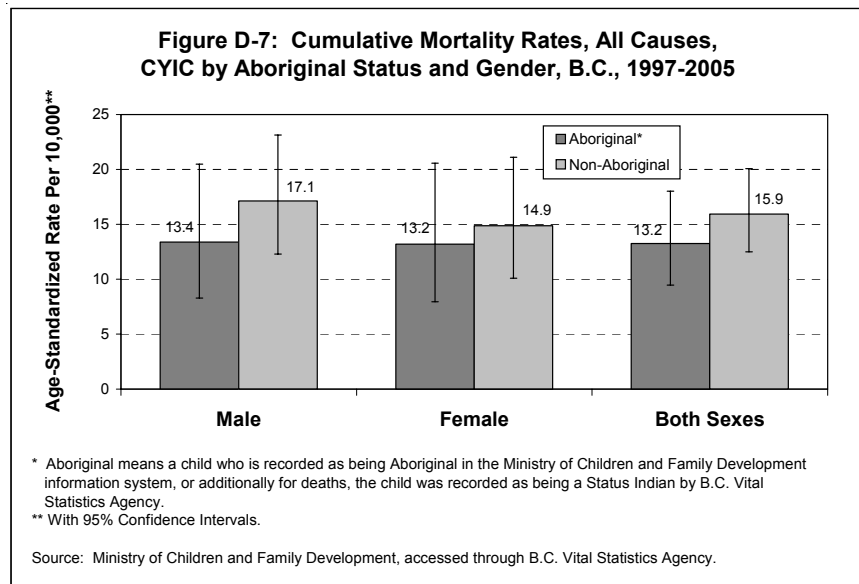
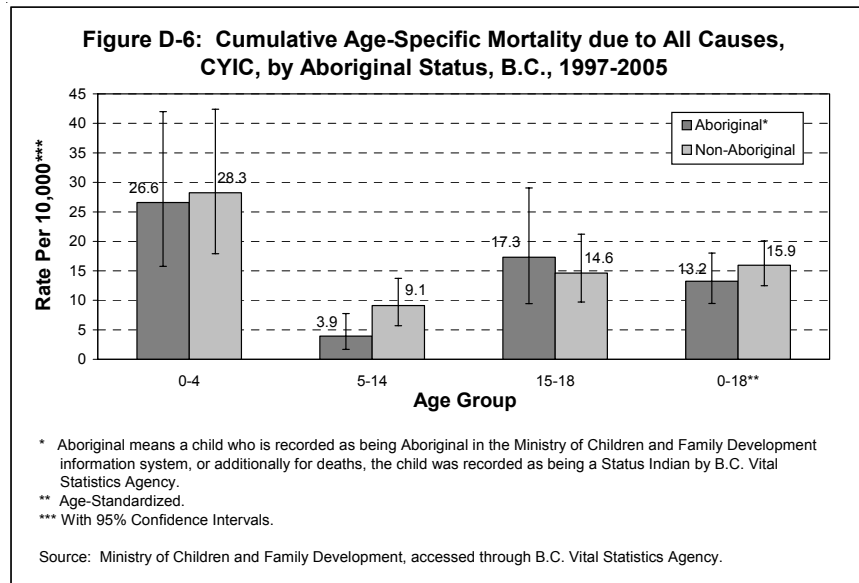
* Log Linear Regression Analysis.

The differences in All Causes age-specific mortality rates for Aboriginal and Non-Aboriginal CYIC were not statistically significant (see Figure D-6).

None of the All Causes mortality differences by gender and Aboriginal Status in CYIC were statistically significant (see Figure D-7). Similarly, none of the Natural Causes or External Causes differences by Aboriginal status were statistically significant (see Figure D-8).

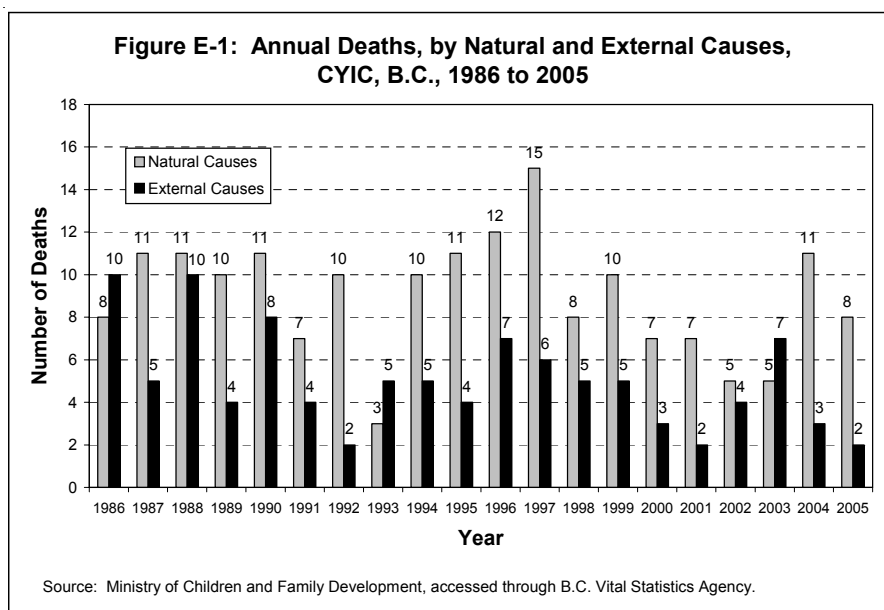
In summary, Aboriginal and non-Aboriginal CYIC had similar mortality experiences by age, gender, and major categories of cause of death. However, over the time period 1997 to 2005, the mortality trend for Aboriginal CYIC has significantly declined, with no significant change in trend for non-Aboriginal CYIC.

This suggests that more than an 9-year period of time may be required to study these trends, collect improved information about these children, and gain a better understanding of both Aboriginal and non-Aboriginal CYIC.



A Description of Mortality by Cause of Death

There were 281 deaths of CYIC over the period 1986 to 2005, of which 180 were due to Natural Causes (almost 2/3 of all deaths), and 101 were due to External Causes (over 1/3 of all deaths). For Natural Causes, the annual range was 3 to 15 deaths, averaging 9 per year. For External Causes, the annual range was 2 to 10 deaths, averaging about 5 per year (see Figure E-1).



In order to compare the mortality of CYIC and the provincial child population by cause of death, cumulative Standardized Mortality Ratios (SMRs) were used to estimate the mortality gap for CYIC. The SMR is a ratio, in this case of the observed number of deaths to CYIC, divided by the “expected” number of deaths to CYIC, with “expected” meaning *as if* they had the same mortality risk as the provincial child population, adjusted for age.

The difference between the observed and “expected” deaths provides an estimate of “excess” deaths, which is the mortality gap for CYIC.

However, this estimation of the mortality gap does not imply that it should be possible for the mortality of CYIC, as a vulnerable high-risk group, to be similar to the mortality of the provincial child population.

The following description of the relative mortality experience of CYIC includes “expected” and “excess” mortality estimates in quotation marks, to emphasize the theoretical nature of these calculations.

The cumulative mortality of CYIC due to Natural and External Causes, as measured by the SMR, is shown in Tables 9 and 10, together with the observed deaths, “expected” deaths, and “excess” deaths.

For each cause of death, by definition the provincial child comparison value is SMR = 1.00, with the SMR for CYIC being a comparison of their cumulative mortality experience relative to the provincial child mortality experience, over the entire period.

A detailed listing by cause of death at the specific disease code level may be found in the Appendix.

Those Natural Causes for which the SMR for CYIC was significantly higher than the provincial child mortality were Congenital Anomalies, Sudden Infant Death Syndrome (SIDS), Diseases of the Nervous System, Diseases of the Respiratory System, Infectious Diseases, Unknown Causes, and Other Natural Causes. Natural Causes with an SMR for CYIC which was not significantly different than the provincial child mortality were Perinatal Conditions, Cancer, and Diseases of the Circulatory System.

Table 9: Mortality Due to Natural Causes, Cumulative Standardized Mortality Ratios, CYIC, B.C., 1986-2005

Cause of Death (ICD)	Standardized Mortality Ratio (SMR)	95% Confidence Intervals (CI)*	Number of Deaths Over 20 Years**		
			Observed	"Expected"	"Excess"
Congenital Anomalies	5.37	4.00 to 7.03	52	9.7	42.3
SIDS***	7.55	5.31 to 10.42	37	4.9	32.1
Diseases of the Nervous System	11.19	7.24 to 16.56	25	2.2	22.8
Diseases of the Respiratory System	6.36	3.05 to 11.71	10	1.6	8.4
Cancer	2.10	0.96 to 3.99	9	4.3	4.7
Perinatal Conditions***	0.70	0.32 to 1.33	9	12.9	(3.9)
Unknown Causes****	5.98	2.40 to 12.33	7	1.2	5.8
Infectious Disease	6.97	2.80 to 14.37	7	1.0	6.0
Diseases of the Circulatory System	3.05	0.99 to 7.11	5	1.6	3.4
Other Natural Causes*****	5.95	3.58 to 9.28	19	3.2	15.8
All Natural Causes	4.22	3.64 to 4.89	180	42.7	137.3

* Schoenberg, Bruce S., Calculating Confidence Intervals for Rates and Ratios, *Neuroepidemiology* 2: 257-265 (1983).

** Totals for "expected" and "excess" deaths may not equal sum of column due to rounding.

*** The SMR calculations for these conditions of infancy were based on the age group <1 year.

**** Includes 5 deaths for which cause is pending investigation.

***** All other Natural Causes not specifically listed in this table.

Those External Causes in which the SMR for CYIC was significantly higher than the provincial child mortality were Suicide, Motor or Unspecified Vehicle Accidents, Accidental Poisoning, Homicide, Other Transport Accidents, and Other External Causes. External Causes with an SMR for CYIC which was not significantly different from the provincial child mortality were Drowning, Fire/Burns, and Falls.

Table 10: Mortality Due to External Causes, Cumulative Standardized Mortality Ratios, CYIC, B.C., 1986-2005

Cause of Death (ICD)	Standardized Mortality Ratio (SMR)	95% Confidence Intervals (CI)*	Number of Deaths Over 20 Years**		
			Observed	"Expected"	"Excess"
Suicide	5.16	3.40 to 7.49	27	5.2	21.8
Motor or Unspecified Vehicle Accidents***	1.93	1.23 to 2.87	24	12.5	11.5
Accidental Poisoning	10.03	5.19 to 17.55	12	1.2	10.8
Homicide	4.63	2.22 to 8.51	10	2.2	7.8
Other Transport Accidents****	2.66	1.27 to 4.89	10	3.8	6.2
Drowning	2.02	0.55 to 5.17	4	2.0	2.0
Fire/Burns	2.76	0.57 to 8.07	3	1.1	1.9
Falls	2.20	0.27 to 7.95	2	0.9	1.1
Other External Causes*****	2.36	1.08 to 4.48	9	3.8	5.2
All External Causes	3.10	2.54 to 3.78	101	32.6	68.4

* Schoenberg, Bruce S., Calculating Confidence Intervals for Rates and Ratios, *Neuroepidemiology* 2: 257-265 (1983).

** Totals for "expected" and "excess" deaths may not equal sum of column due to rounding.

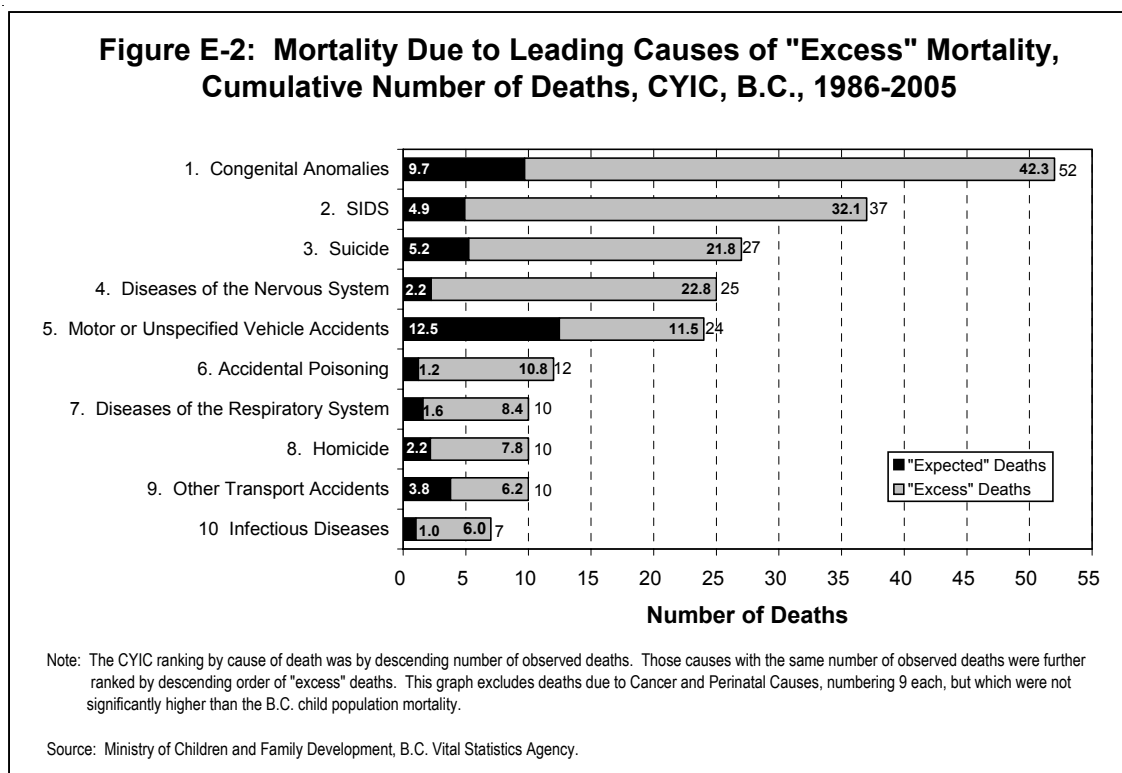
*** Includes 18 deaths with type of vehicle unspecified, 6 deaths to occupants of car, van, or pick-up truck.

**** Includes 5 deaths to pedestrians, 2 to motor cyclists, 2 involving commercial aircraft, and 1 involving a boat.

***** All other External Causes not specifically listed in this table.

The Leading Causes of “Excess” Mortality in CYIC

The ten most frequent causes of death (the Leading Causes) which were significantly increased in CYIC above the provincial child population experience are summarized and shown in rank order in Figure E-2 and Table 11, including a comparison with the corresponding rank for the provincial child population.



Most of the Leading causes of CYIC death had higher ranks than the provincial child population, and accounted for about 76% of observed and 83% of “excess” deaths. The top four causes of death each comprised over 10% of the “excess” deaths, and collectively comprised 57% of “excess” deaths.

Table 11: Mortality Due to Leading Causes of “Excess” Mortality, CYIC, B.C., 1986-2005

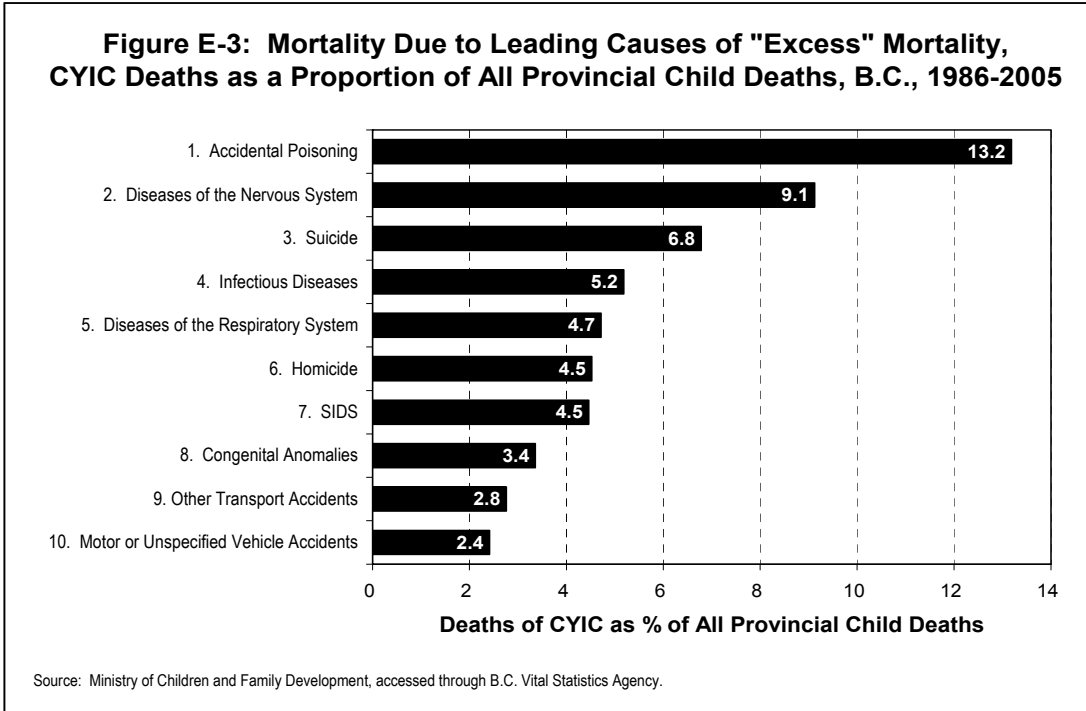
CYIC Rank*	B.C. Rank**	Cause of Death	Standardized Mortality Ratio	Percent of Observed Deaths	Number of Deaths Over 20 Year***			Percent of "Excess" Deaths
					Observed	"Expected"	"Excess"	
1	2	Congenital Anomalies	5.37	18.5	52	9.7	42.3	20.6
2	4	SIDS	7.55	13.2	37	4.9	32.1	15.6
3	6	Suicide	5.16	9.6	27	5.2	21.8	10.6
4	8	Diseases of the Nervous System	11.19	8.9	25	2.2	22.8	11.1
5	3	Motor or Unspecified Vehicle Accidents	1.93	8.5	24	12.5	11.5	5.6
6	15	Accidental Poisoning	10.03	4.3	12	1.2	10.8	5.3
7	11	Diseases of the Respiratory System	6.36	3.6	10	1.6	8.4	4.1
8	9	Homicide	4.63	3.6	10	2.2	7.8	3.8
9	7	Other Transport Accidents	2.66	3.6	10	3.8	6.2	3.0
10	13	Infectious Diseases	6.97	2.5	7	1.0	6.0	2.9
10 Leading Causes			-	76.2	214	44.2	169.8	82.5
Other Causes Not Listed Above			-	23.8	67	31.0	36.0	17.5
All Natural Causes			4.22	64.1	180	42.7	137.3	66.8
All External Causes			3.10	35.9	101	32.6	68.4	33.2
All Causes			3.73	100	281	75.3	205.7	100.0

* The CYIC ranking was by descending number of observed deaths. Those causes with the same number of observed deaths were further ranked by descending order of "excess" deaths.

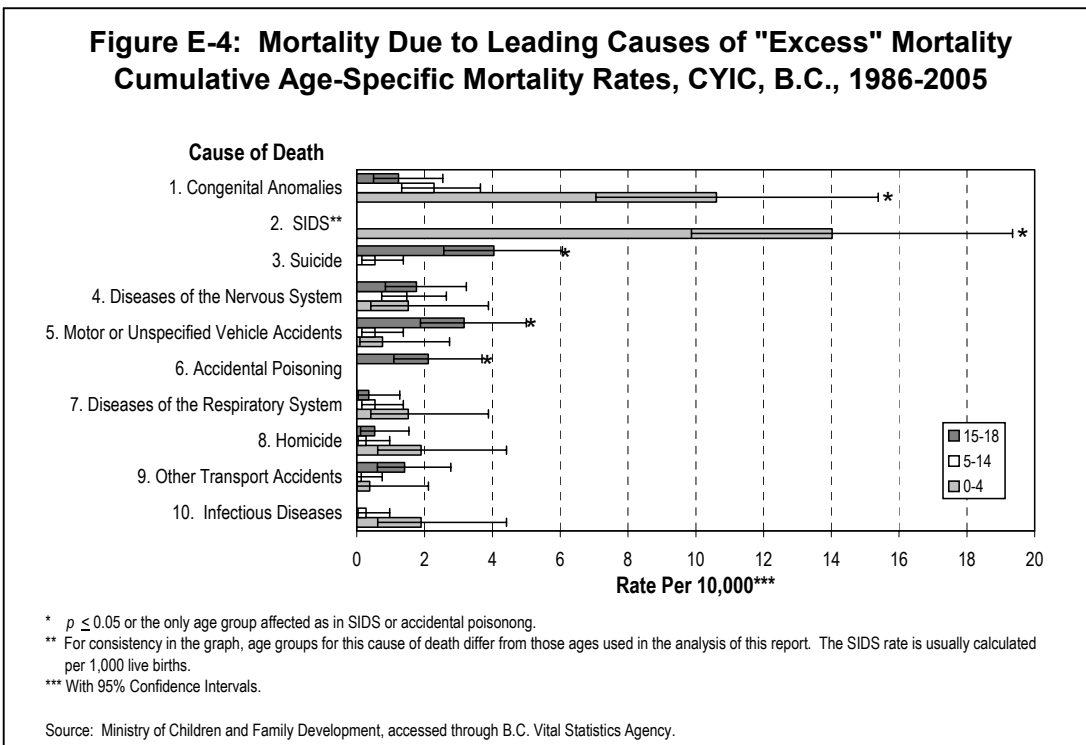
** The others of the ten provincial leading causes of child death not listed above are Perinatal Causes (#1), Cancer (#5), and Drowning (#10).

*** Totals for "expected" and "excess" deaths do not equal sum of column due to rounding, and because the SMR for All Natural Causes includes all age groups for "expected" deaths due to SIDS.

Within the total B.C. child population, CYIC accounted for 13.2% of all child deaths due to Accidental Poisoning, 9.1% of Diseases of the Nervous System, 6.8 % of Suicides, and so on, although CYIC only constitute about 1% of the provincial child population (see Figure E-3).

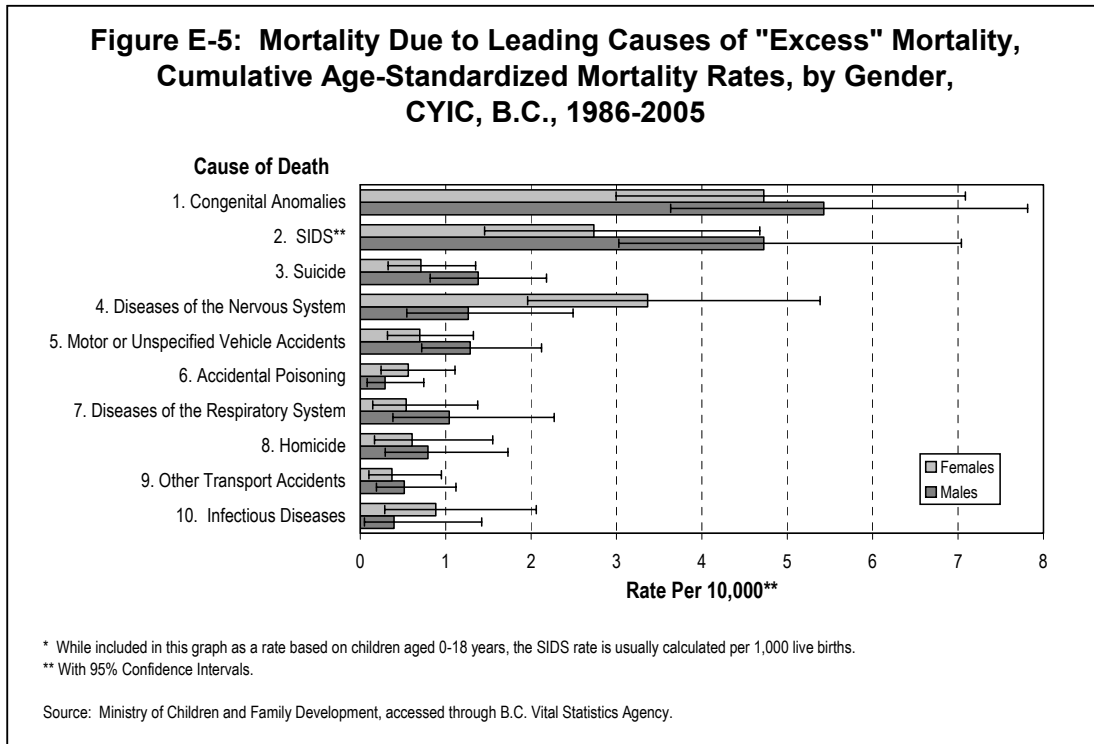


For the Leading Causes by age group, ages 0-4 had a significantly higher mortality for Congenital Anomalies, and by definition, SIDS* is only diagnosed in infants under age 1 year (see Figure E-4). Ages 15-18 had a significantly higher mortality for Motor Vehicle Traffic Accidents and Suicide, and for Accidental Poisoning was the only age group affected.

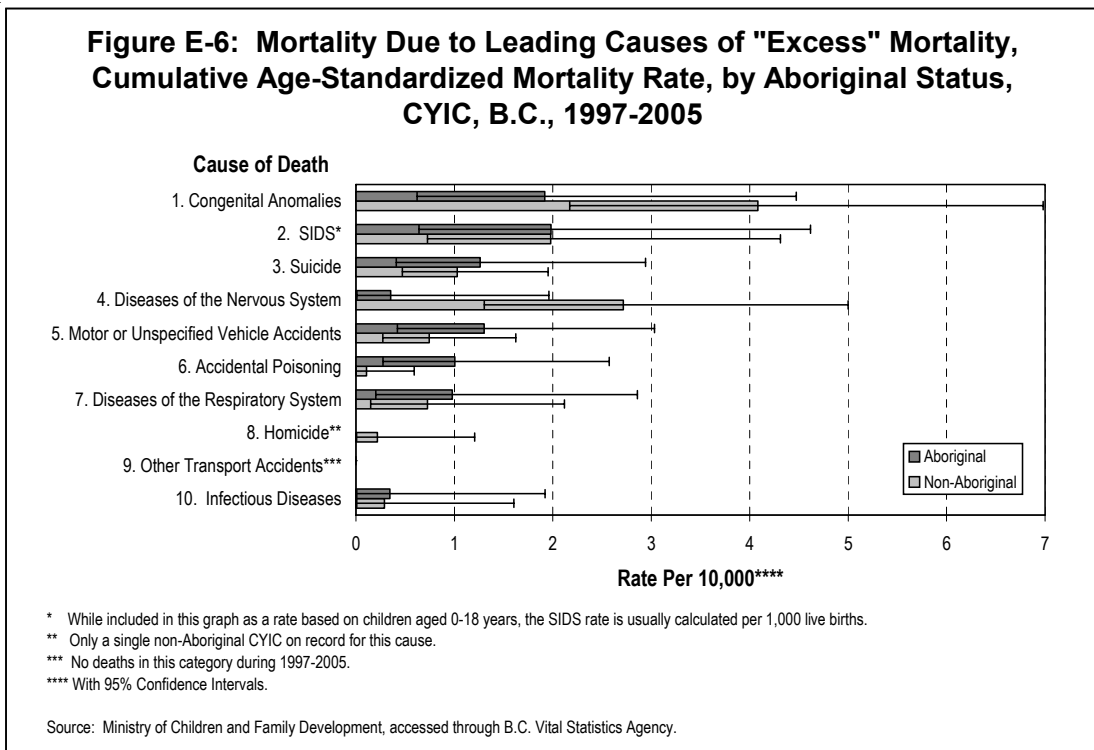


* These data exclude any case which is still under investigation by the Office of the Chief Coroner.

For the Leading Causes by gender, none of the differences between males and females were statistically significant (see Figure E-5).



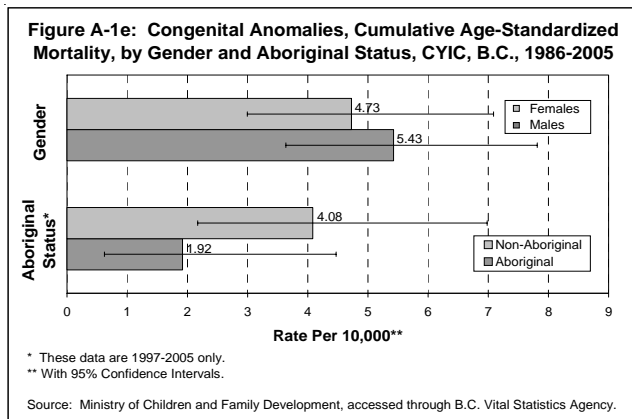
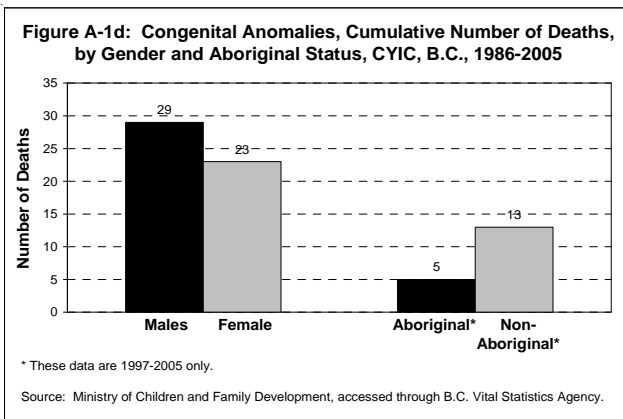
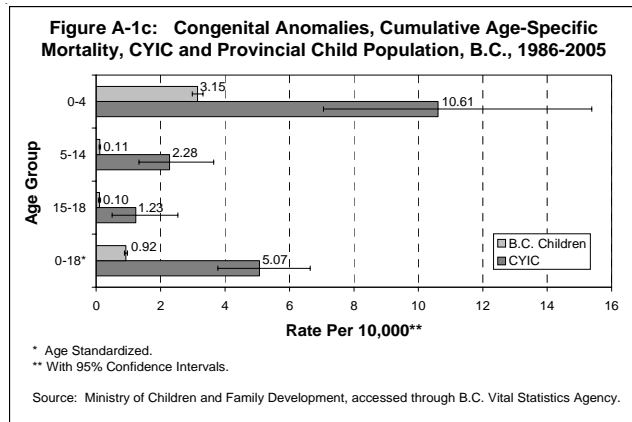
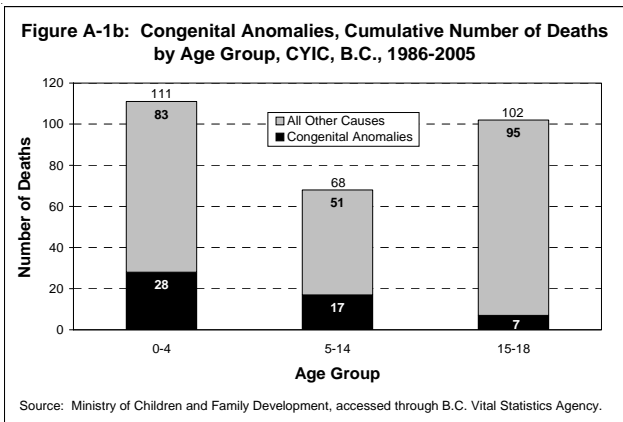
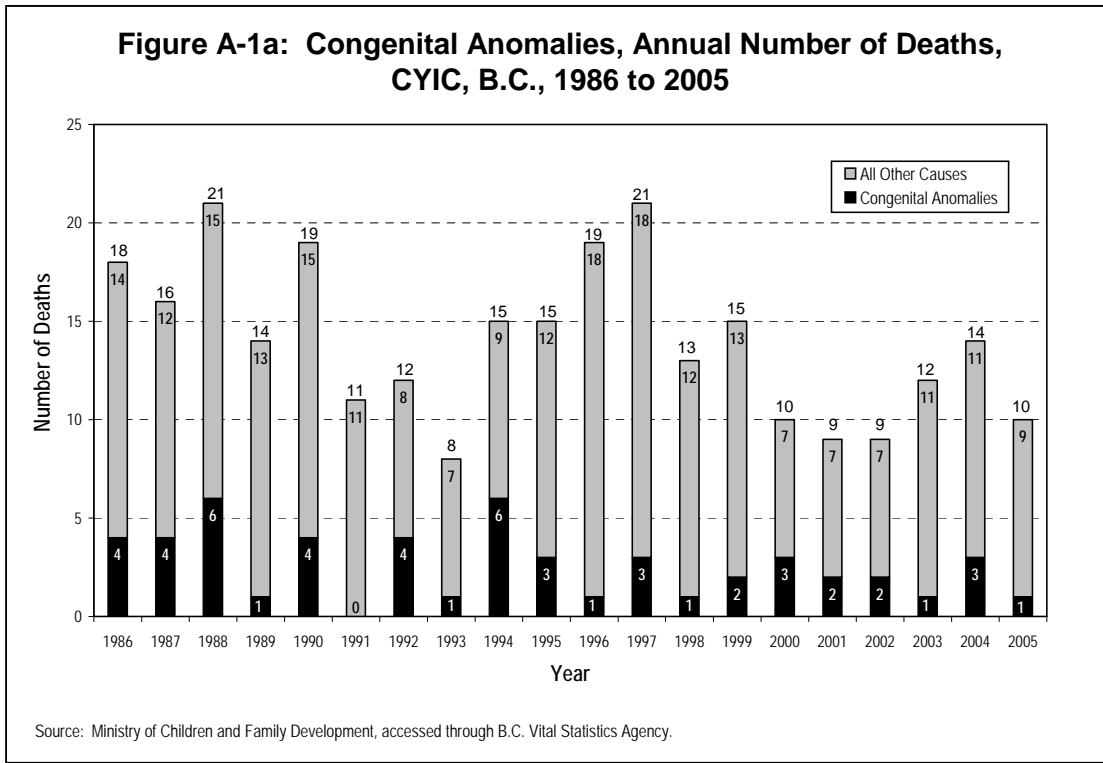
For the Leading Causes by Aboriginal Status, none of the mortality differences were statistically significant, however, there was only a single recorded Homicide case* which involved a Non-Aboriginal CYIC (see Figure E-6), insufficient data for the purpose of comparison.



* Data subject to change following completion of investigations by the Coroner.

**Appendix: The Leading
Causes Of Mortality
for Children and Youth in Care
by Specific Cause of Death**

Leading Cause 1: Congenital Anomalies



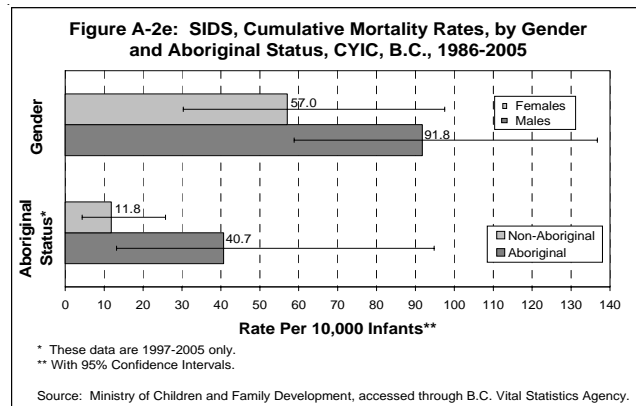
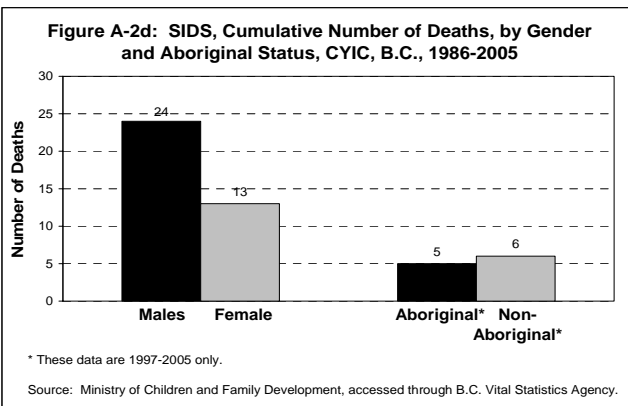
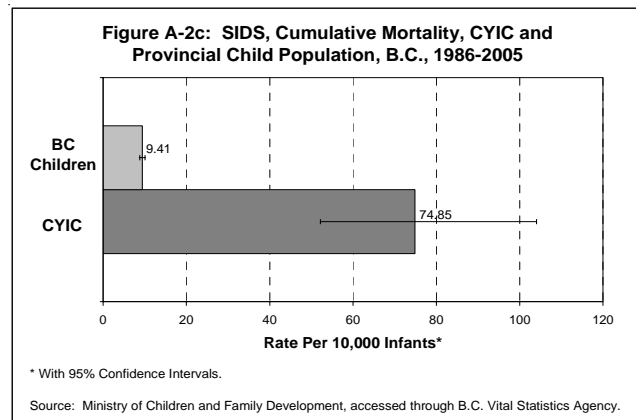
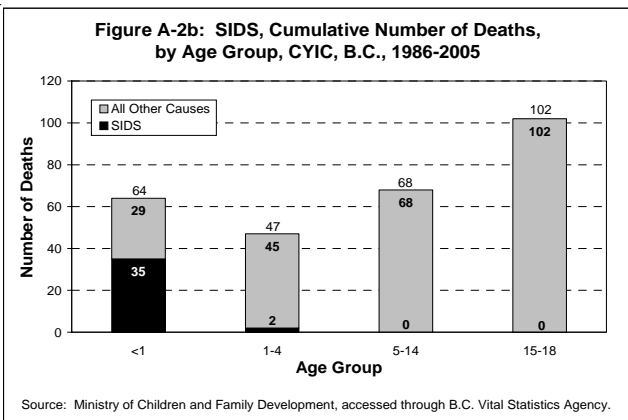
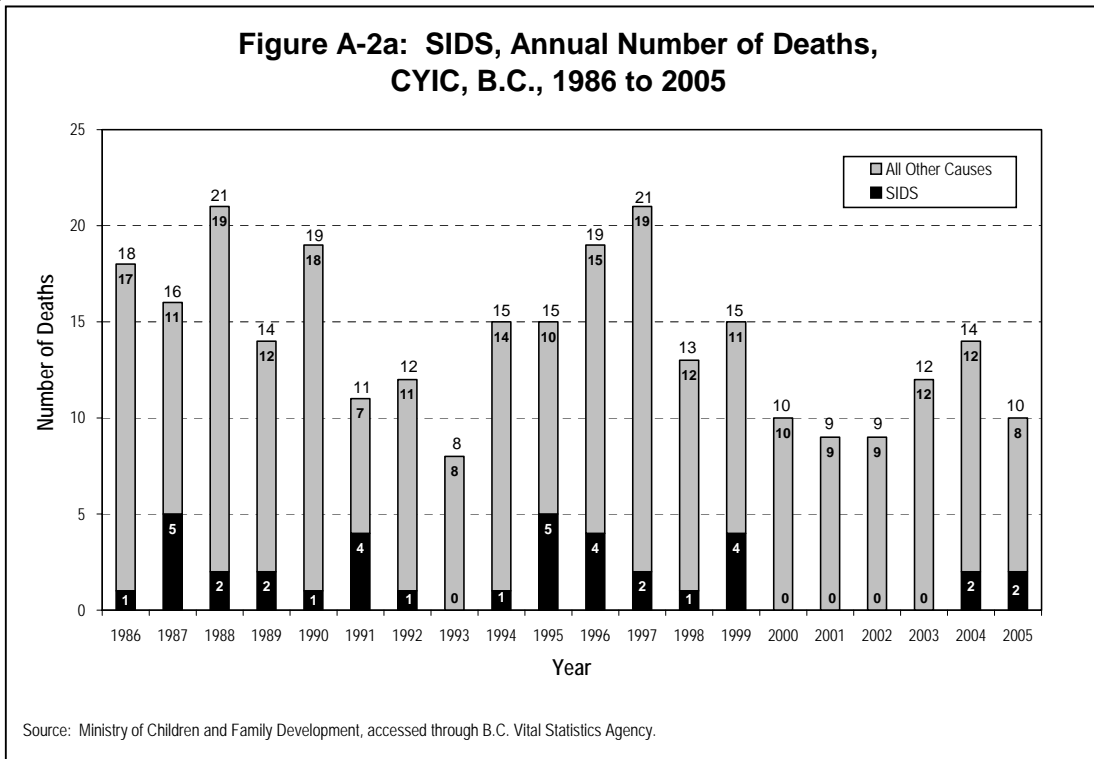
Cumulative Deaths Due to Congenital Anomalies, CYIC, B.C., 1986-2005

ICD	Cause of Death	No. of Deaths	% of Deaths
Q00-Q07	Congenital malformations of the nervous system		
Q038-039	Congenital hydrocephalus	4	31
Q02	Microcephaly	2	
Q031	Dandy Walker syndrome	2	
Q043	Aicardi's syndrome	2	
Q049	Cerebral dysgenesis	2	
Q079	Unspecified anomalies of brain, spinal cord and nervous system	2	
Q042	Holoprosencephaly	1	
Q054	Spina bifida with hydrocephalus	1	
	Subtotal	16	
Q20-Q28	Congenital malformations of the circulatory system		
Q249	Congenital malformation of heart	6	25
Q213	Tetralogy of fallot	4	
Q211	Atrial septal defect	1	
Q249	Unspecified congenital heart anomaly	1	
Q283	Congenital cerebral aneurysm	1	
	Subtotal	13	
Q90-Q99	Chromosomal abnormalities, not elsewhere classified		
Q909	Down's syndrome	2	12
Q913	Edwards' syndrome	2	
Q917	Patau's syndrome	1	
Q939	Deletion from autosomes, unspecified	1	
	Subtotal	6	
Q80-Q89	Other congenital malformations		
Q871	Cornelia De Lange syndrome	3	15
Q897	Multiple congenital malformations, not elsewhere classified	2	
Q823	Incontinentia pigmenti	1	
Q872	Congenital malformation syndromes predominantly involving limbs - VA	1	
Q872	Congenital malformation syndromes predominantly involving limbs - Sim	1	
	Subtotal	8	
Q38-Q45	Other congenital malformations of the digestive system		
Q438	Other specified congenital malformations of intestine	2	8
Q398	Other congenital malformations of esophagus	1	
Q433	Congenital malformations of intestinal fixation	1	
	Subtotal	4	
Q60-Q64	Congenital malformations of the urinary system		
Q600	Renal agenesis, unilateral	1	6
Q605	Renal hypoplasia, unspecified	1	
Q675	Congenital deformity of spine (scoliosis)	1	
	Subtotal	3	
Other Q00-Q99	Other congenital anomalies		
Q348	Other anomalies of larynx, trachea and bronchus	1	4
Q442	Atresia of bile ducts	1	
	Subtotal	2	
All Q00-Q99	Total congenital anomalies	52	100*

* Sum of groupings may not equal 100 due to rounding.

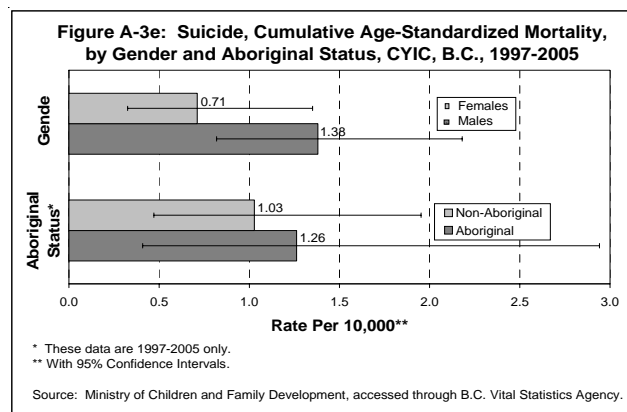
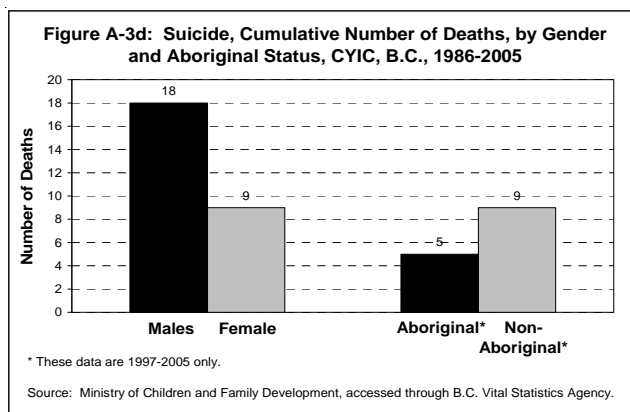
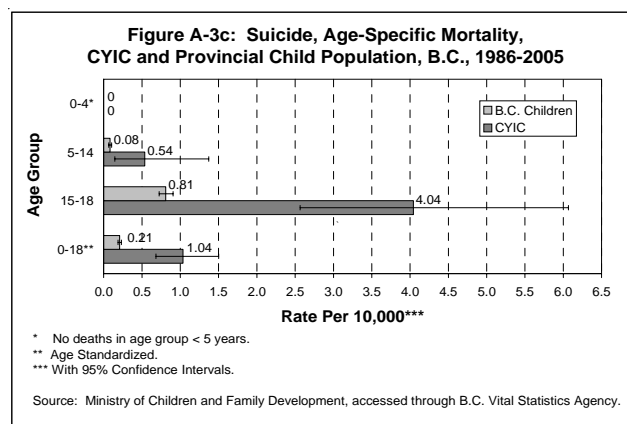
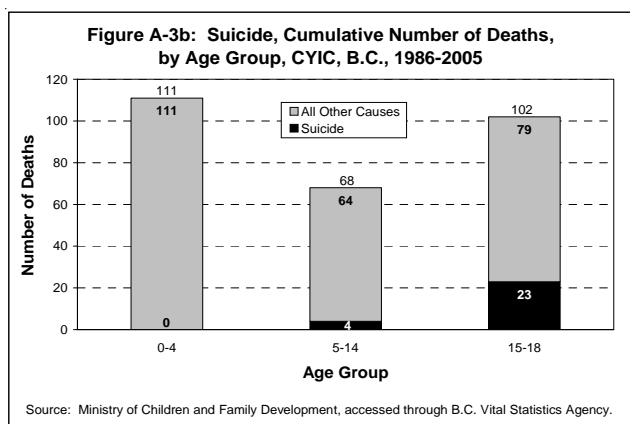
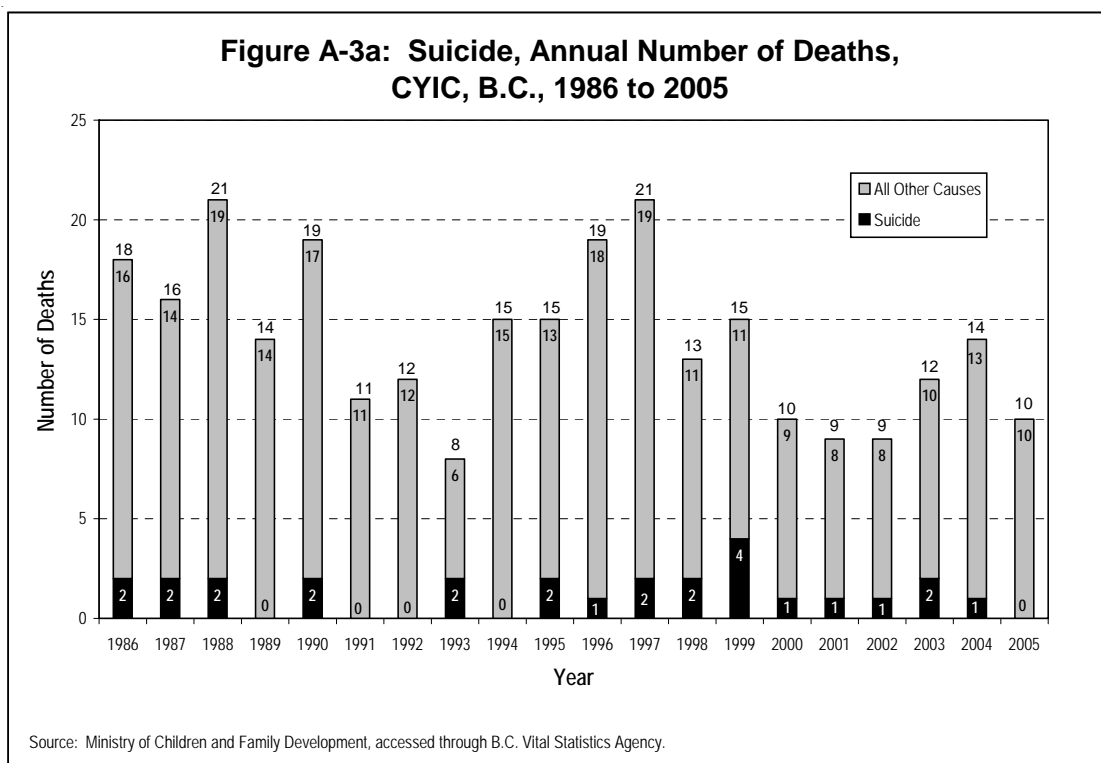
Source: Ministry of Children and Family Development, accessed through the B.C. Vital Statistics Agency.

Leading Cause 2: Sudden Infant Death Syndrome (SIDS)*



* As some deaths provisionally classified as Unknown Cause are still under investigation by the coroner, it is possible that these numbers may increase.

Leading Cause 3: Suicide



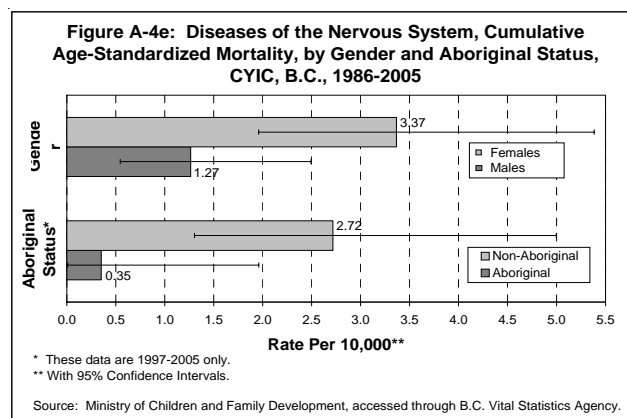
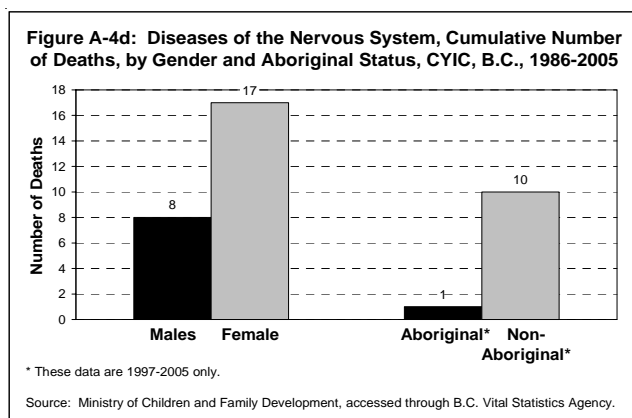
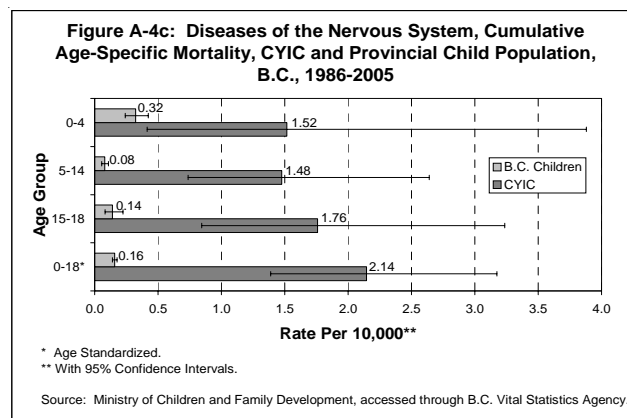
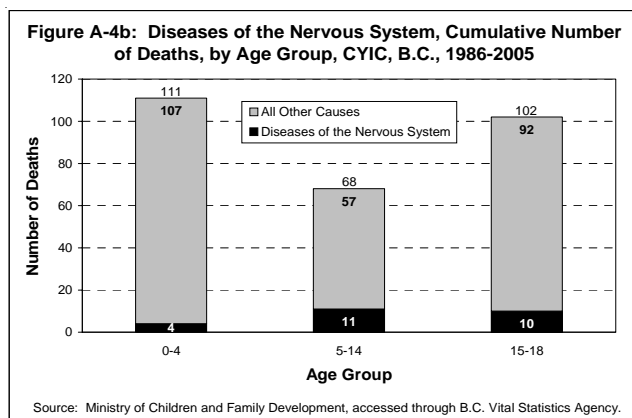
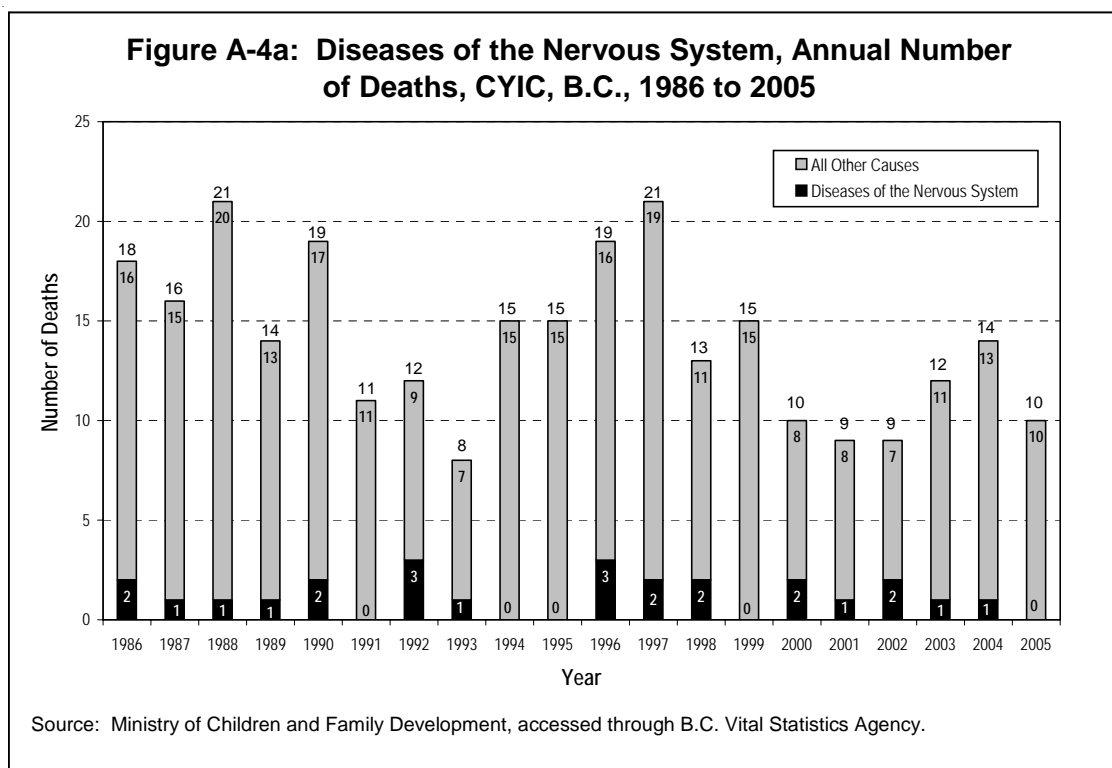
Cumulative Deaths Due to Suicide, CYIC, B.C., 1986-2005

ICD	Cause of Death	No. of Deaths	% of Deaths
X70	Intentional self-harm by hanging, strangulation & suffocation		
X70	Suicide by hanging	16	59
X80-X81	Intentional self-harm by jumping or by lying before moving object		
X80	Intentional self-harm by jumping from a high place	4	19
X81	Intentional self-harm by jumping or lying before moving object	1	
	Subtotal	5	
X72-X74	Intentional self-harm by firearm discharge		
X74	Suicide by other and unspecified firearm	1	11
X74	Suicide by self-inflicted shooting	1	
X74	Suicide by gunshot to head	1	
	Subtotal	3	
X60-X69	Intentional self-poisoning		
X64	Suicide by overdose of cocaine	1	7
X64	Intentional mixed drug overdose	1	
	Subtotal	2	
Other X60-X84	Other intentional self-harm		
X83	Suicide by jumping from moving vehicle	1	4
All X60-X84	Total intentional self-harm	27	100*

* Sum of groupings may not equal 100 due to rounding.

Source: Ministry of Children and Family Development, accessed through the B.C. Vital Statistics Agency.

Leading Cause 4: Diseases of the Nervous System



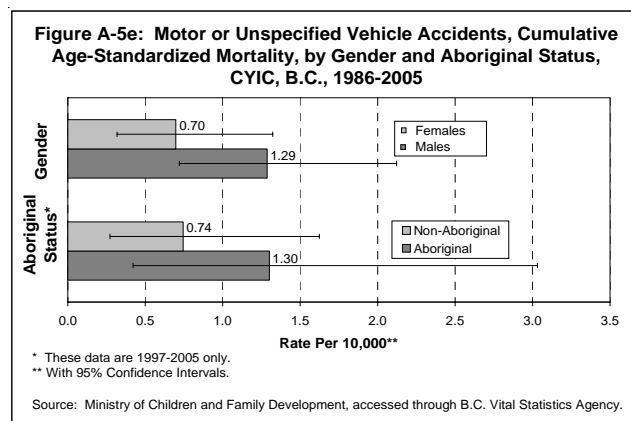
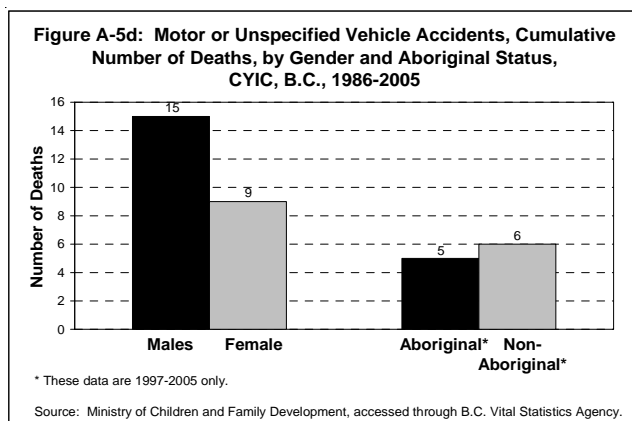
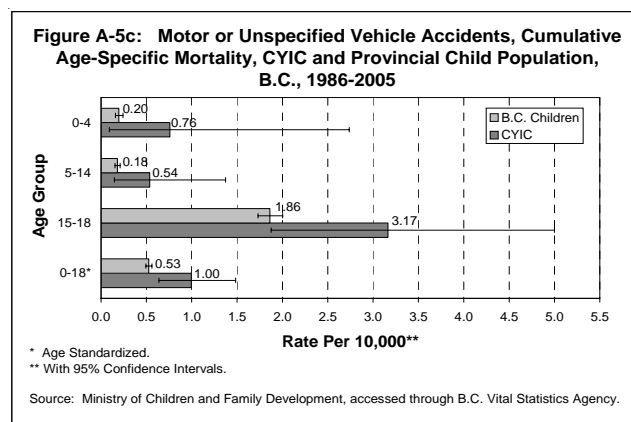
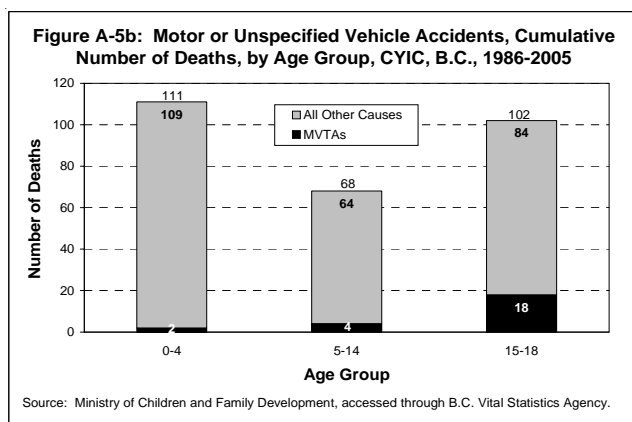
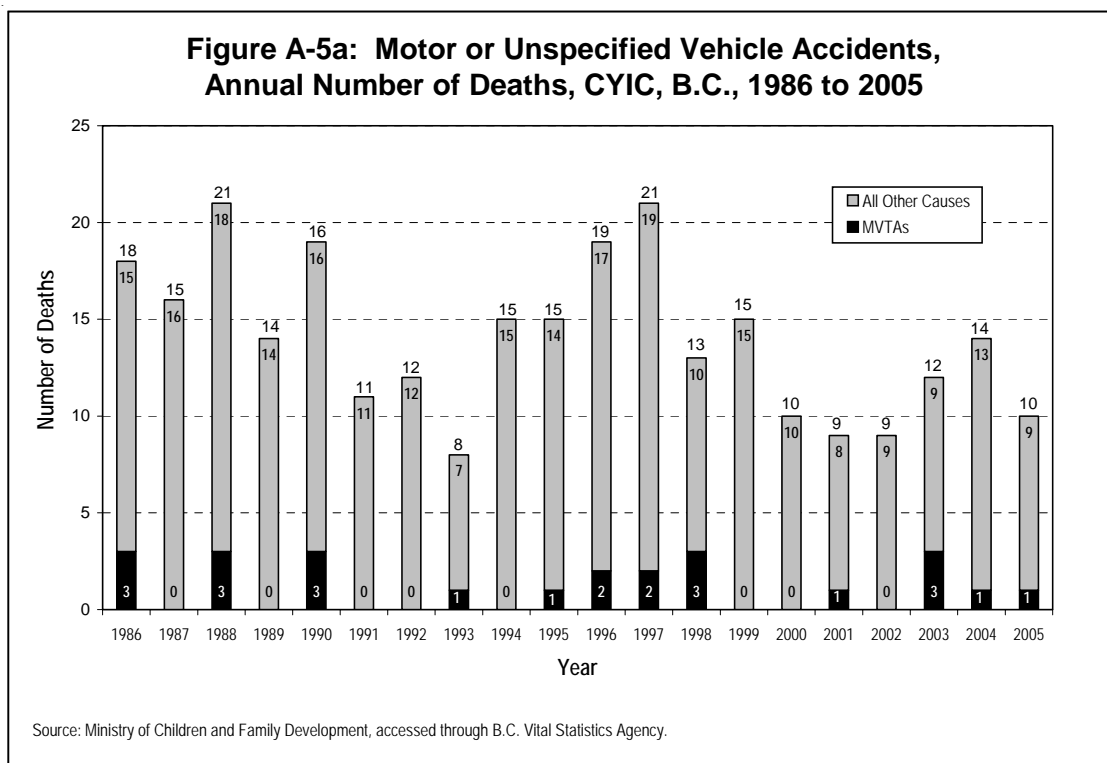
Cumulative Deaths Due to Diseases of the Nervous System, CYIC, B.C., 1986-2005

ICD	Cause of Death	No. of Deaths	% of Deaths
G80-G83	Cerebral palsy and other paralytic syndromes		
G809	Infantile cerebral palsy, unspecified	9	56
G808	Other infantile cerebral palsy	5	
	Subtotal	14	
G40-G47	Episodic and paroxysmal disorders		
G409	Epilepsy, unspecified	4	20
G419	Status epilepticus, unspecified	1	
	Subtotal	5	
G10-G13	Systemic atrophies primarily affecting the central nervous system		
G111	Friedreich's ataxia	2	8
	Subtotal	2	
Other G00-G99	Other diseases of the nervous system		
G09	Late effects of intracranial abscess or pyogenic infection	1	
G710	Hereditary progressive muscular dystrophy	1	
G936	Unexplained cerebral edema	1	
G969	Disorders of central nervous system, unspecified	1	
	Subtotal	4	
All G00-G99	Total diseases of the nervous system	25	100*

* Sum of groupings may not equal 100 due to rounding.

Source: Ministry of Children and Family Development, accessed through the B.C. Vital Statistics Agency.

Leading Cause 5: Motor or Unspecified Vehicle Accidents



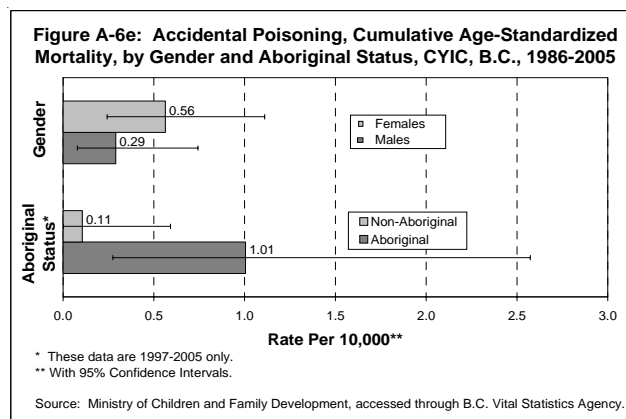
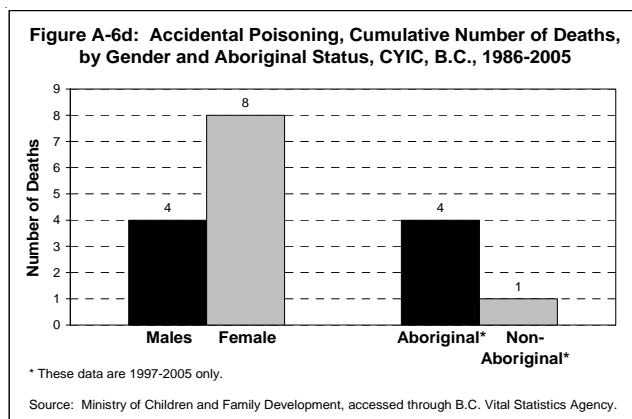
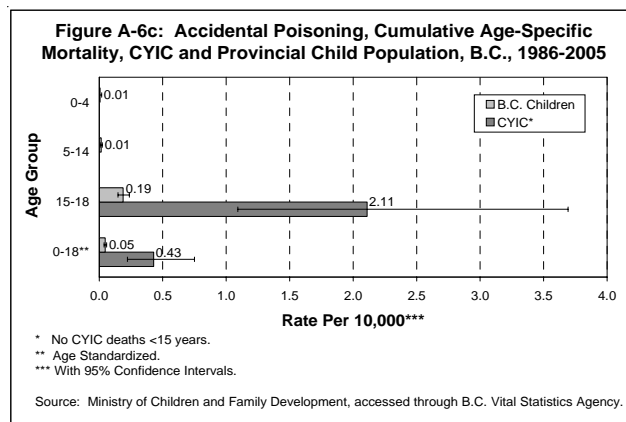
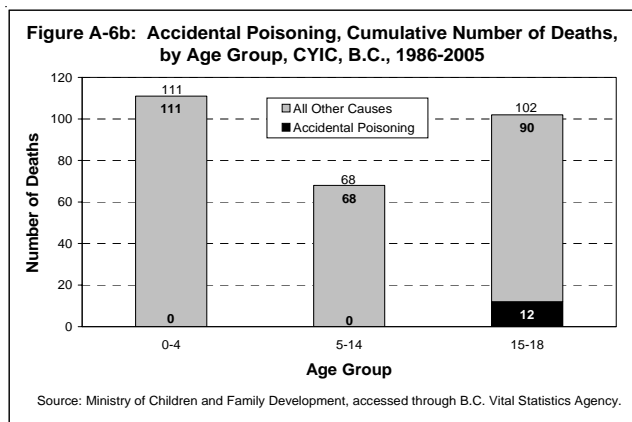
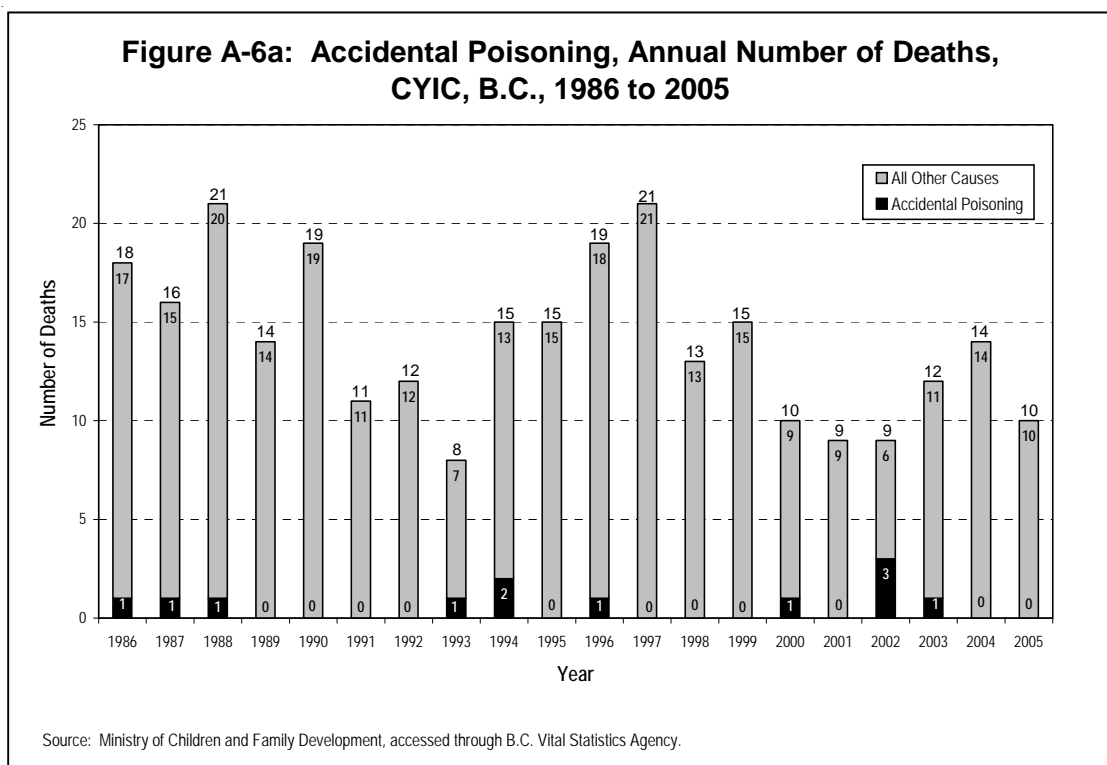
Cumulative Deaths Due to Motor or Unspecified Vehicle Accidents, CYIC, B.C., 1986-2005

ICD	Cause of Death	No. of Deaths	% of Deaths
V80-V89	Other land transport accidents		
V89	Motor or non-motor vehicle accident, type of vehicle unspecified	18	75
	Subtotal	18	
V40-V49	Car occupant injured in transport accident		
V43	Car occupant injured in collision with car, pick-up truck or van	1	17
V44	Car occupant injured in collision with bus or heavy transport vehicle	1	
V47	Car occupant injured in collision with fixed or stationary object	1	
V48	Car occupant injured in non-collision transport accident	1	
	Subtotal	4	
V50-V59	Occupant of pick-up truck or van injured in transport accident		
V57	Occupant of pick-up truck or van injured in collision fixed or stationary object	1	8
V53	Occupant of pick-up truck or van injured in collision with car, pick-up truck or van	1	
	Subtotal	2	
All MVTAs	Total motor vehicle traffic accidents	24	100*

* Sum of groupings may not equal 100 due to rounding.

Source: Ministry of Children and Family Development, accessed through the B.C. Vital Statistics Agency.

Leading Cause 6: Accidental Poisoning



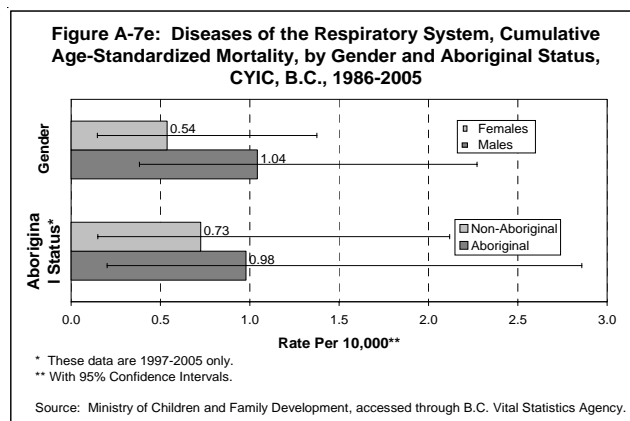
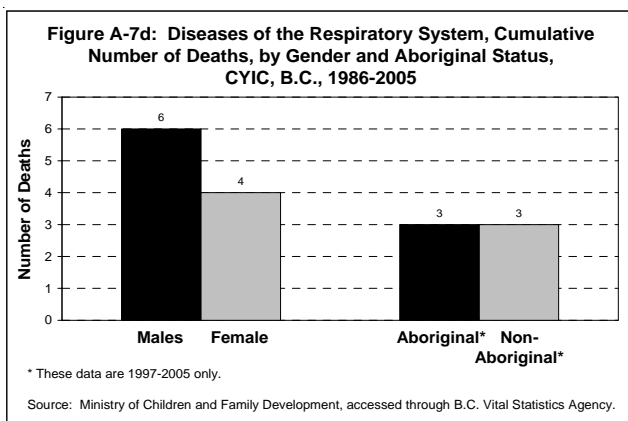
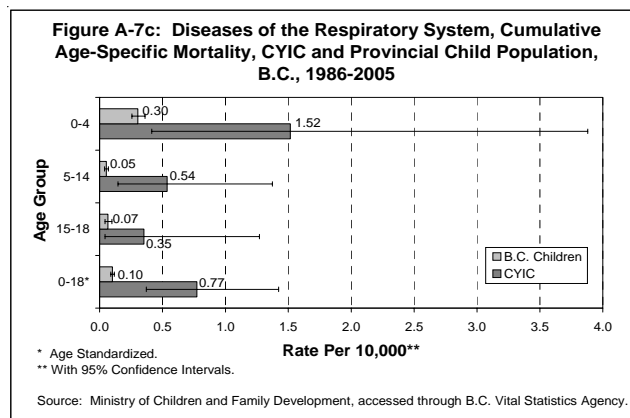
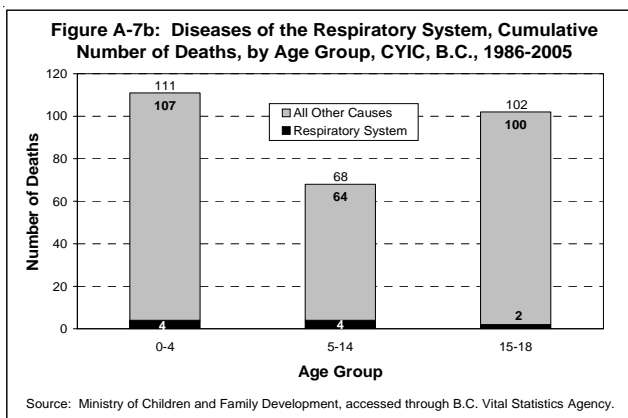
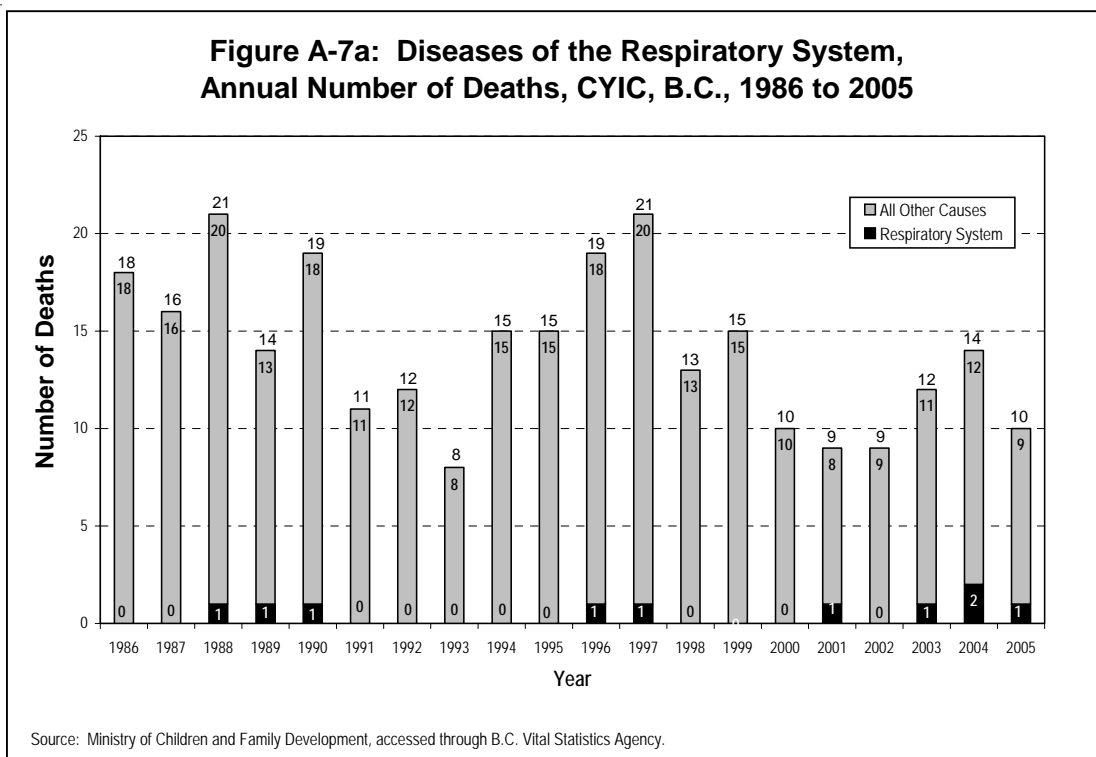
Cumulative Deaths Due to Accidental Poisoning, CYIC, B.C., 1986-2005

ICD	Cause of Death	No. of Deaths	% of Deaths
X40-X49	Accidental poisoning by & exposure to noxious substances		
X42	Other narcotics & psychodysleptics (hallucinogens), not elsewhere classified	6	50
X41	Antiepileptic, sedative-hypnotic, antiparkinsonism and psychotropic drugs, not elsewhere classified	2	17
X46	Organic solvents and halogenated hydrocarbons & their vapours	2	17
X44	Other and unspecified drugs, medicaments and biological substances	1	8
X47	Other gases & vapours	1	8
All X40-X49	Total accidental poisoning	12	100*

* Sum of groupings may not equal 100 due to rounding.

Source: Ministry of Children and Family Development, accessed through the B.C. Vital Statistics Agency.

Leading Cause 7: Diseases of the Respiratory System



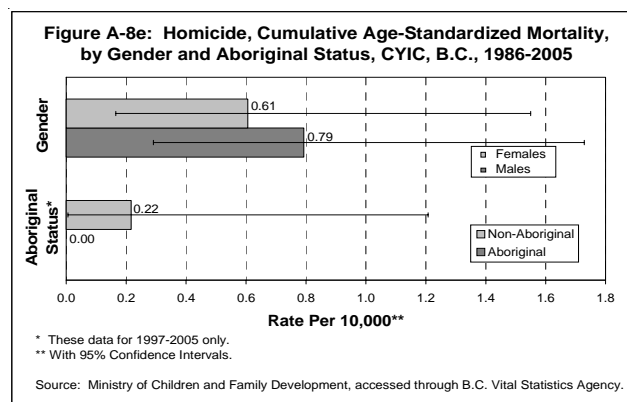
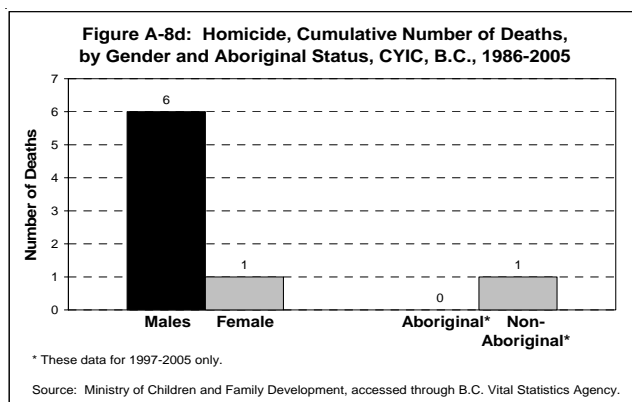
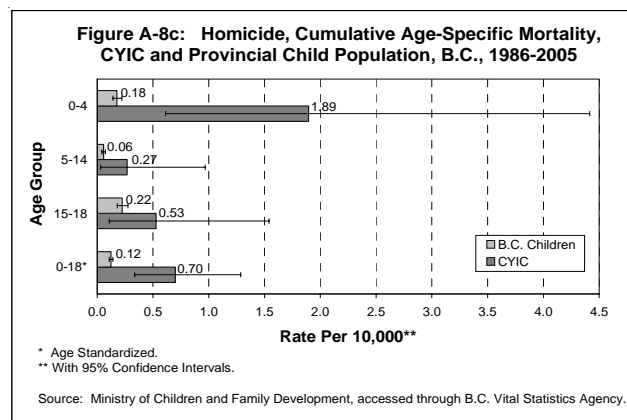
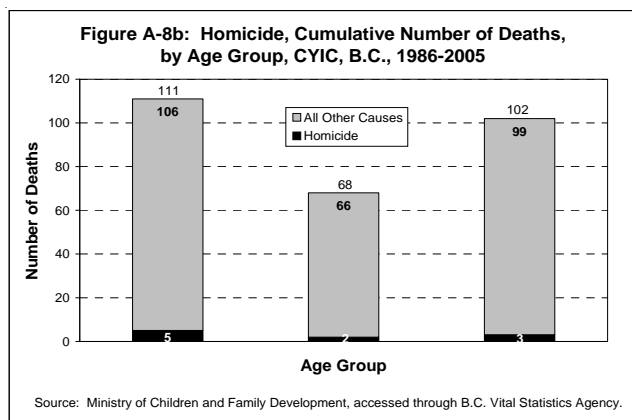
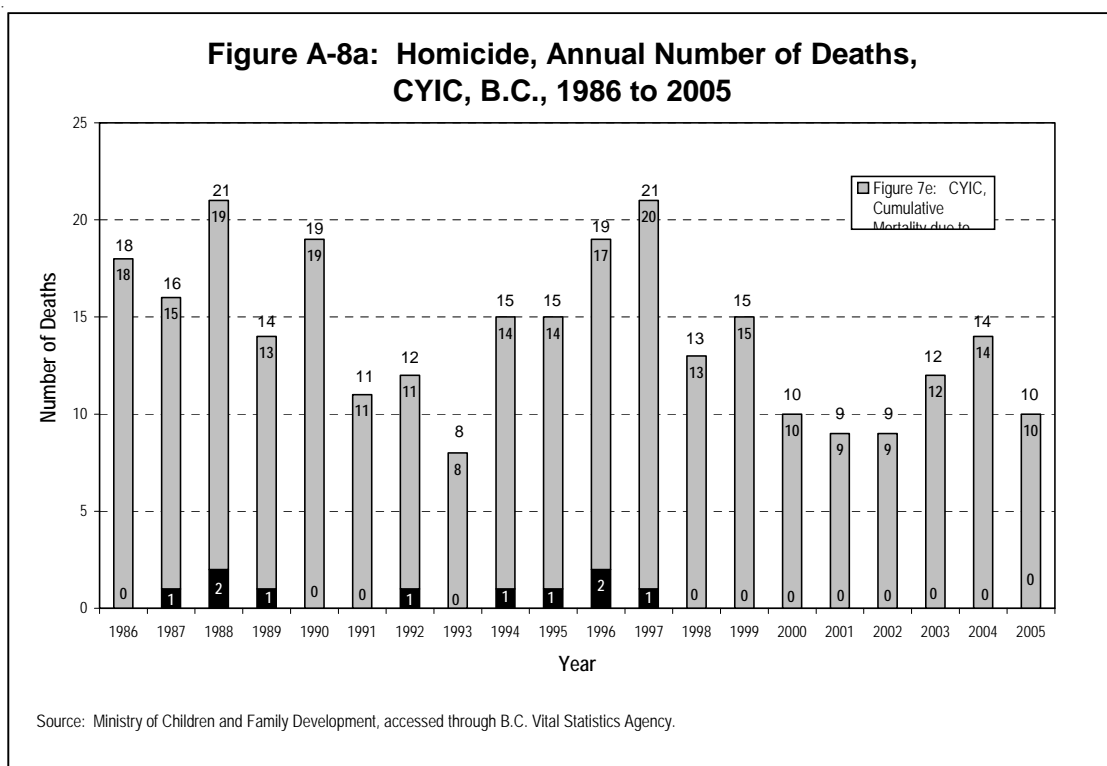
Cumulative Deaths Due to Diseases of the Respiratory System, CYIC, B.C., 1986-2005

ICD	Cause of Death	No. of Deaths	% of Deaths
J10-J18	Pneumonia & influenza		
J189	Pneumonia, unspecified	3	60
J120	Adenoviral pneumonia	1	
J121	Respiratory syncytial virus pneumonia	1	
J180	Bronchopneumonia, unspecified	1	
	Subtotal	6	
J20-J22	Other acute lower respiratory infections		
J219	Acute bronchiolitis, unspecified	1	10
	Subtotal	1	
J40-J47	Bronchitis, not specified as acute or chronic		
J459	Asthma, unspecified	1	10
	Subtotal	1	
J60-J70	Lung diseases due to external agents		
J690	Aspiration pneumonia	2	20
	Subtotal	2	
All J00-J99	Total diseases of the respiratory system	10	100*

* Sum of groupings may not equal 100 due to rounding.

Source: Ministry of Children and Family Development, accessed through the B.C. Vital Statistics Agency.

Leading Cause 8: Homicide



Cumulative Deaths Due to Homicide, CYIC, B.C., 1986-2005*

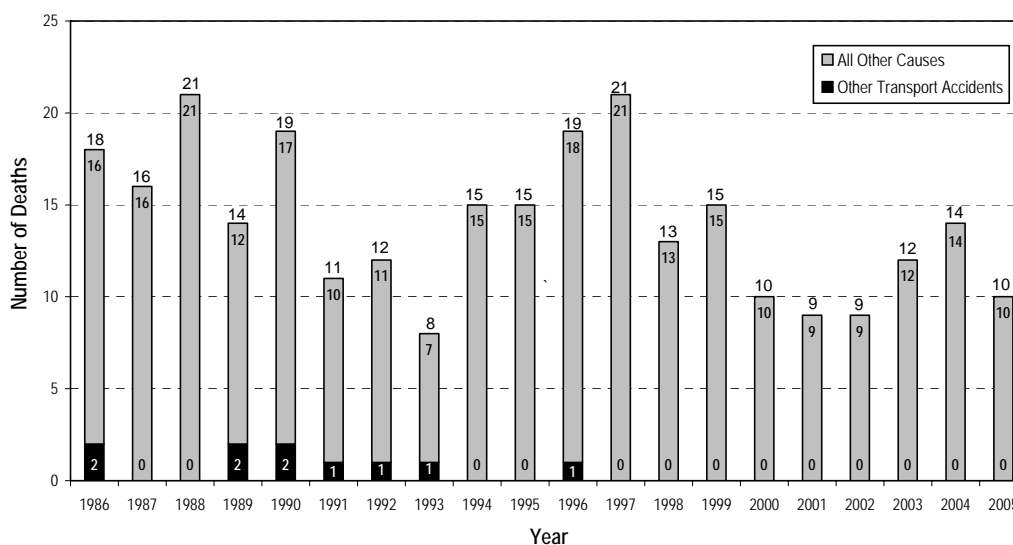
ICD	Cause of Death	No. of Deaths	% of Deaths
X93-X95	Assault by firearm discharge		
X94	Assault by rifle, shotgun and larger firearm discharge	1	20
X95	Assault by other and unspecified firearm	1	
	Subtotal	2	
X99	Assault by sharp object		
X99	Assault by cutting and piercing instrument	2	20
	Subtotal	2	
Y09	Assault by unspecified means		
Y09	Assault by unspecified means	2	20
	Subtotal	2	
Other Assault	Other assault		
X92	Assault by drowning and submersion	1	40
X97	Assault by smoke, fire and flames	1	
Y04	Assault by bodily force	1	
Y871	Sequelae of assault	1	
	Subtotal	4	
All X85-Y09	Total assault	10	100*

* Sum of groupings may not equal 100 due to rounding.

Source: Ministry of Children and Family Development, accessed through the B.C. Vital Statistics Agency.

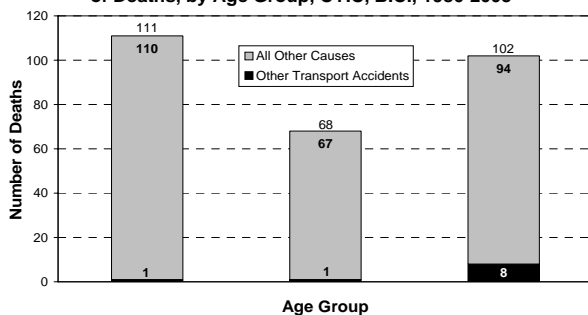
Leading Cause 9: Other Transport Accidents

Figure A-9a: Other Transport Accidents, Annual Number of Deaths, CYIC, B.C., 1986-2005



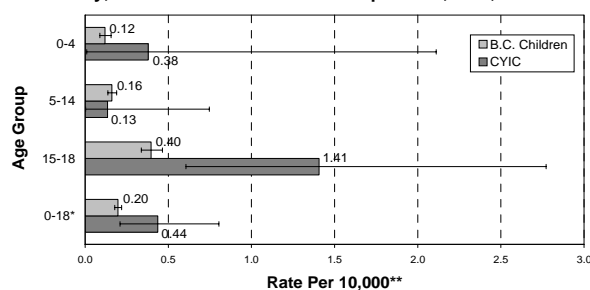
Source: Ministry of Children and Family Development, accessed through B.C. Vital Statistics Agency.

Figure A-9b: Other Transport Accidents, Cumulative Number of Deaths, by Age Group, CYIC, B.C., 1986-2005



Source: Ministry of Children and Family Development, accessed through B.C. Vital Statistics Agency.

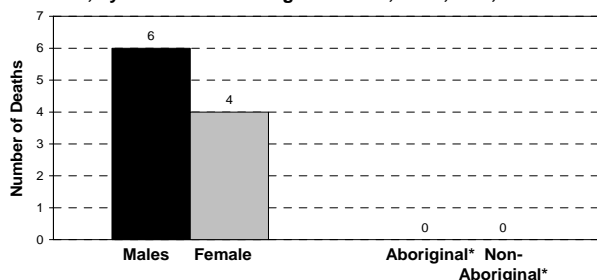
Figure A-9c: Other Transport Accidents, Cumulative Age-Specific Mortality, CYIC and Provincial Child Population, B.C., 1986-2005



* Age Standardized.
** With 95% Confidence Intervals.

Source: Ministry of Children and Family Development, accessed through B.C. Vital Statistics Agency.

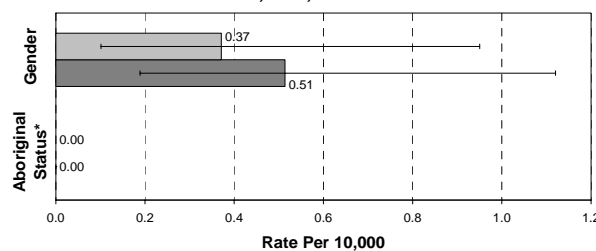
Figure A-9d: Other Transport Accidents, Cumulative Number of Deaths, by Gender and Aboriginal Status, CYIC, B.C., 1986-2005



* These data for 1997-2005 only - No Other Transport Accidents during this time period.

Source: Ministry of Children and Family Development, accessed through B.C. Vital Statistics Agency.

Figure A-9e: Other Transport Accidents, Cumulative Age-Standardized Mortality, by Gender and Aboriginal Status, CYIC, B.C., 1986-2005



* These data for 1997-2005 only - no Other Transport Accidents during this period.
** With 95% Confidence Intervals.

Source: Ministry of Children and Family Development, accessed through B.C. Vital Statistics Agency.

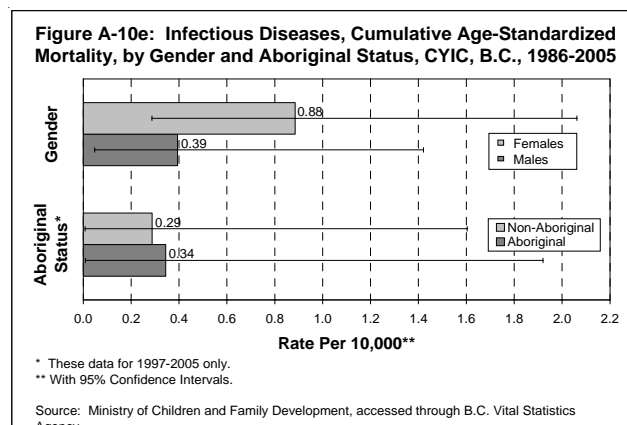
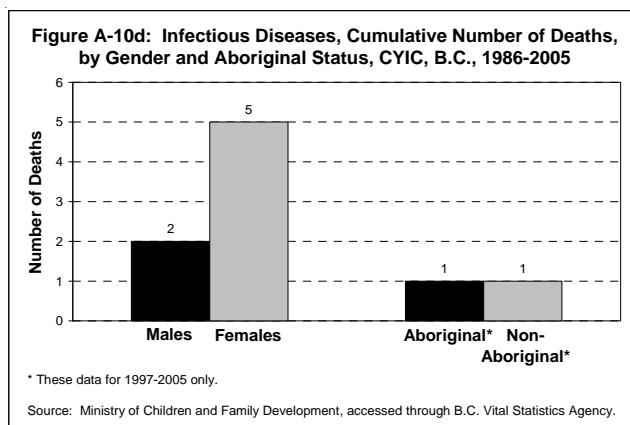
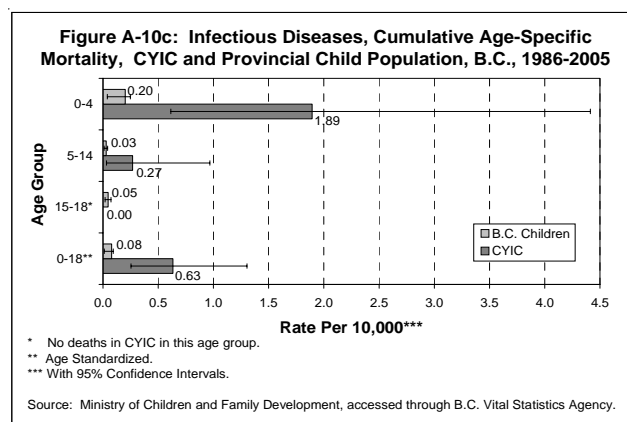
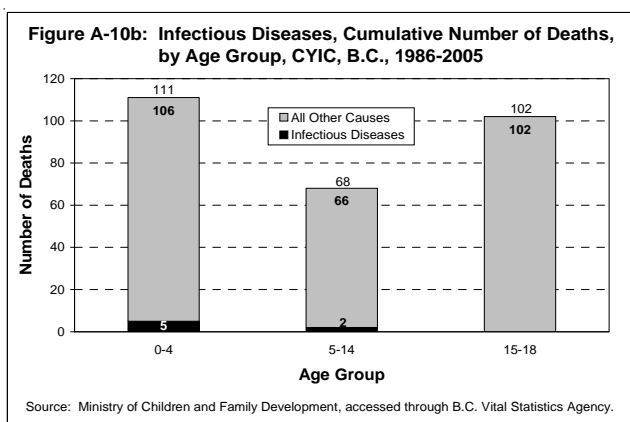
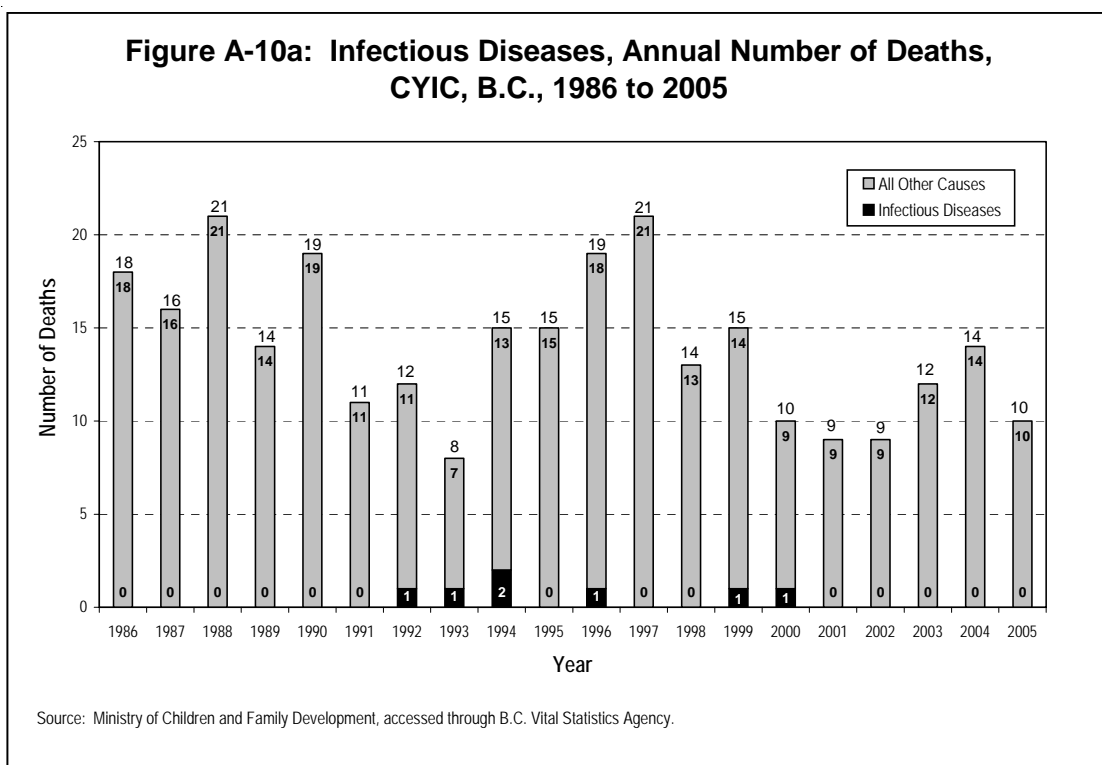
Cumulative Deaths Due to Other Transport Accidents, CYIC, B.C., 1986-2005

ICD	Cause of Death	No. of Deaths	% of Deaths
V01-V09 V09	Pedestrian injured in transport accident Pedestrian injured in other and unspecified transport accidents	5	50
	Subtotal	5	
V20-V29 V27 V28	Motorcycle rider injured in transport accident Motorcycle rider injured in collision with fixed or stationary object Motorcycle rider injured in noncollision transport accident	1 1	20
	Subtotal	2	
V95-V97 V95	Air and space transport accidents Accident to powered aircraft causing injury to occupant	2	20
	Subtotal	2	
V90-V94 V90	Water transport accidents Accident to watercraft causing drowning or submersion	1	10
	Subtotal	1	
All other transport	Total other transport accidents	10	100*

* Sum of groupings may not equal 100 due to rounding.

Source: Ministry of Children and Family Development, accessed through the B.C. Vital Statistics Agency.

Leading Cause 10: Infectious Diseases



Cumulative Deaths Due to Infectious Diseases, CYIC, B.C., 1986-2005

ICD	Cause of Death	No. of Deaths	% of Deaths
A30-A49	Other bacterial diseases		
A401	Septicaemia due to streptococcus, group B	1	43
A419	Septicaemia, unspecified	2	
	Subtotal	3	
B20-B24	Human immunodeficiency virus (HIV) disease		
B208	HIV disease resulting in other infectious and parasitic diseases	1	29
B24	Acquired immunodeficiency syndrome (AIDS)	1	
	Subtotal	2	
Other A00-B99	Other infectious and parasitic diseases		
A047	Enterocolitis due to <i>clostridium difficile</i>	1	29
B012	Varicella pneumonia	1	
	Subtotal	2	
All A00-B99	Total infectious diseases	7	100*

* Sum of groupings may not equal 100 due to rounding.

Source: Ministry of Children and Family Development, accessed through the B.C. Vital Statistics Agency.