

Suicide and Attempted Suicide in Nova Scotia

1995–2004

A REPORT


NOVA SCOTIA

Health Promotion
and Protection



Suicide and Attempted Suicide in Nova Scotia

1995–2004

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Suicide and Attempted Suicide in Nova Scotia (1995–2004): A Report

Population Health Research Unit (Dalhousie University) in collaboration with the Nova Scotia Department of Health Promotion and Protection.

Designed by Laura Graham Design

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The analysis and the report were written and prepared by researcher/coordinator Peter Nestman with the assistance of analyst Yan Wang, analyst Ravin Randhawa, and former director Mark Smith of the Population Health Research Unit (PHRU) at Dalhousie University, and Julian Young, Nova Scotia Department of Health Promotion and Protection.

Foreword

Suicide, or attempted suicide, eventually touches the lives of many Nova Scotians, whether through family, a friend, a work colleague, or a community member. This is an important public health issue, but despite the fact that most of us are affected by it, it remains a silent problem, quietly whispered about behind closed doors. We need to bring suicide to the forefront and develop a better understanding of the patterns and trends associated with suicide and attempted suicide in our province. This will allow us to further enhance the societal, policy, and individual supports required to address suicide in Nova Scotia.

In 2004 Nova Scotia became the first jurisdiction in Canada to establish a provincial injury prevention strategy led and funded by government. The Nova Scotia Injury Prevention Strategy identifies addressing suicide as a priority, and in support, the Department of Health Promotion and Protection collaborated with many partners to launch the Nova Scotia Strategic Framework to Address Suicide in the fall of 2006.

Development of the following report was one of the recommended actions outlined in the framework. It draws on a number of data sources to present an accurate, statistical picture of suicide and attempted suicide in Nova Scotia. Our intent is for this report to be a resource in our collective efforts to address suicide—a resource that will inform the actions and decisions of policy makers and suicide prevention stakeholders alike.

Suicide and attempted suicide are an issue that affects all of us, and I encourage you to make suicide prevention a priority. For those of you who have already done so, thank you for your work in this area. By working together across all sectors we can help prevent many suicides and suicide attempts and improve the lives of our families, friends, and communities.

*Robert Strang, MD, MHSC, FRCPC
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Methodology

This report examines hospital and vital statistics records for suicides and suicide attempts in Nova Scotia over a 10-year period, between fiscal years 1995 and 2004. It examines demographic factors, the means utilized for attempted and completed suicides, and the types of health-care services that suicidal individuals made use of.

A suicide is defined in this report as intentionally terminating one's own life through one of the following means:

- intentional self-poisoning with one of the following:
 - anticonvulsant, sleeping disorder, depression/anxiety drugs
 - non-narcotic pain, fever, or anti-inflammatory medication
 - motor vehicle exhaust or other gases/vapours
 - medications and/or biological substances (e.g., general anesthetics, muscle relaxants, nitrous oxide, etc.)
 - other
- hanging, strangulation, or suffocation
- intentional drowning or submersion
- intentional discharge from a firearm such as
 - a handgun
 - a hunting rifle, shotgun, or large firearm
 - other and unspecified firearms
- intentional jumping from high places
- intentional cutting or piercing with a sharp object
- other means, with intention, such as
 - the use of fire, flames, or smoke
 - steam, hot vapours, or objects
 - the use of blunt objects
 - moving in front of moving objects
 - crashing a motor vehicle
 - utilizing explosive materials
 - other unspecified or specified methods

A complete list of the diagnostic codes analysed in this report can be found in Appendix 1. The diagnostic codes listed do not distinguish between self-harm and suicide.

Provincial suicide statistics were analysed from the following two datasets:

- **Vital Statistics Database (VS):** The VS database contains detailed information about all deaths in Nova Scotia, including demographic information and underlying cause of death. This database was used to evaluate Nova Scotia deaths that were coded as a suicide.
- **Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD):** The information in this database comes from admission/separation forms completed by hospitals at the end of each uninterrupted patient stay. The CIHI-DAD contains comprehensive, patient-level information (e.g., demographics, diagnoses, treatments) for each admission to a Nova Scotia hospital. These data provide information about the nature of suicide-related hospitalizations (e.g., time and location of an attempted suicide, anatomic site of injury, length of hospital stay, etc.).

Diagnostic information in both VS and CIHI-DAD is coded using the International Statistical Classification of Diseases and Related Health Problems, more commonly referred to as ICD-9-CM for years 1995–2001 and ICD-10-CA for 2001–2004. These systems provide specific codes for health conditions and injuries, including suicide (Appendix 1).

The two datasets used in this study identified a cohort of 5,958 individuals who were either hospitalized for one or more suicide attempts or who died by suicide between the fiscal years 1995 and 2004. Other datasets used to augment the analyses were the following:

- **Insured Patient Registry:** The Insured Patient Registry contains longitudinal information (e.g., date of birth, patient geography) about every resident of Nova Scotia who is registered as a beneficiary of provincial Medical Services Insurance (MSI) health care. This registry was used to determine the population eligible for health-care services in each year. Records for some citizens who have their health-care costs covered under federal plans (e.g., Canadian Armed Forces, RCMP) are not captured in this database.
- **2001 Canada Census – Nova Scotia Component (Census):** The 2001 Census file contains statistical data from the 2001 Canadian Census including demographic and household information and socio-economic indicators. These data were used to assign median household income (at the dissemination area level) to the study sample.
- **Patient Geography Database:** The Patient Geography Database contains geographic information based on postal code for every patient in each of the other databases. In areas where postal codes do not map exactly to other geographic boundaries, Statistics Canada’s Postal Code Conversion File (PCCF+) was used to map postal codes to census dissemination areas. The procedure assigns geographic codes probabilistically using the relative population weights of the surrounding areas. This procedure was used to assign individual records to district health authorities (DHAs) and census dissemination areas (DAs).
- **Mental Health Outpatient Information System:** The Mental Health Outpatient Information System contains patient and provider information relating to mental health clinics across Nova Scotia. This database was used when analysing the history of visits to mental health clinics of the population who attempted or completed suicide.¹
- **MSI Physician Billings:** The Physician Billing database contains administrative records for each insured health service rendered by a physician and paid for by the Nova Scotia provincial healthcare system. These services include those in an office of a general practitioner, in an emergency room and by specialists such as psychiatrists.

1. MHOIS: Although the reliability of the information in this dataset has been questioned, it was used for this report as it is one of the few datasets available specific to mental health.

Crude and age-adjusted rates of attempted suicide and suicides were calculated. Crude rates represent the actual number of suicide attempts or deaths during each fiscal year (i.e., 11/100,000). An age-adjusted rate is a weighted average of the age-specific crude rates, where the weights are the proportions of persons in the corresponding age groups of a standard population. The purpose of using age-adjusted rates is to enable comparisons between jurisdictions or groups that have populations with different age-sex compositions or to make comparisons across different years. In this study, crude rates did not vary significantly from age-adjusted rates. Crude rates were provided in this report to demonstrate the actual numerical rate of suicide in Nova Scotia. Age-adjusted rates were offered when different populations (e.g., sex, age) were being compared.

Suicide rates, both attempted and completed, were calculated by dividing the number of hospital admissions for suicide attempts or the number of suicide deaths listed in vital statistics by the representative population and multiplying that by 100,000. For example, there were 114 completed suicides in 1999 in an overall population of 971,766, resulting in a crude death rate of $114/971,766 * 100,000 = 11.73$ per 100,000².

The frequency of hospitalizations for suicide attempts and suicide completions in comparison to other causes of hospitalization and death was also provided in this report. For coding reasons, only years 2001–2004 were captured, and it should be noted that there may be small fluctuations in the frequencies of suicides compared to other causes of hospitalizations and deaths in other reports, as the categories used may utilize different codes and years.

Factors Associated with Suicide

The report sought to measure the degree to which sex, age, and each of the following factors were influences in the rate of attempted or completed suicide:

1. Urban/rural status: An area was defined as urban if it was designated as a census metropolitan area (CMA) or a census agglomeration (CA) in the Patient Geography Database³. A CMA is a geographic region that encompasses an urban core with a population of 100,000 or more; a CA is a geographic region that encompasses an urban core with a population of 10,000–99,999. In Nova Scotia, there is one CMA (Halifax), and there are four CAs (Kentville, Truro, New Glasgow, and Sydney) (Statistics Canada 2001). All other regions of the province were defined as rural.

2. Household income: Median household income for census dissemination areas (DAs) was obtained from the 2001 Canadian Census and linked to individual records by DA. The range and quartiles for median household income were computed for each DHA.

3. Contacts with mental health services: The types of mental health services used by suicidal patients were examined including

- hospital visits
- visits to mental health clinics (information from a variety of occupational providers)
- visits to emergency rooms (those that were billed through MSI)
- visits to a family physician
- visits to psychiatrists

2. Confidence Intervals were calculated using the following formulas:

$$\text{Crude CI} = \text{Rate} \pm 1.96 \sqrt{\frac{\text{Rate} \cdot (100,000 - \text{Rate})}{\text{Total pop at year}}} \quad \text{Age Adjusted CI} = \text{Rate} \pm 1.96 * \left(\frac{\text{Rate} \cdot 100,000}{\text{Total population}} \right)$$

3. The definition for urban/rural status used in this report is similar to “metropolitan/non-metropolitan” status.

The report sought to identify rates of suicide and prior health-care utilization of those who attempted or completed suicide according to the severity of their mental disorder. For this report, the definition for severe mental disorders includes bipolar and schizophrenia disorders. McAlpine and Mechanic (2000, 277–92) state that “severe mental illnesses are those that are most clinically complex and persistent. Although the specific diagnoses and illnesses that meet these criteria may be debatable, there is consensus that schizophrenia and bipolar disorders are among the most severe mental illnesses.” “Other mental disorders” would include other mental disorders and substance abuse.

ICD-9 and ICD-10 codes used to define mental health contacts are listed in Appendix 2 and include the following categories of disorders:

Severe Mental Disorders

- bipolar disorders
- schizophrenia disorders

Other Mental Disorders

- conduct disorders
- anxiety disorders
- depressive disorders
- other neurotic disorders
- substance abuse
- organic disorders
- other

This report identifies health contacts and mental health diagnoses of individuals who attempted or completed suicide between the years 1995 and 2004. As it is important to understand the degree of impact that health services are having on different groups in preventing suicide, whether or not patients were being guided to the appropriate services for their conditions and whether there were consistent levels of service across the province, this report attempted to compare utilization patterns based on severity of mental disorders and health status and by demographics (e.g., age, sex, income quartile, urban/rural status).

Limitations

The diagnostic codes analysed in this report are from the ICD-9-CM and ICD-10 coding systems, which do not distinguish between measures of self-harm with and without suicidal intent. As a result, this report could overestimate suicide numbers, particularly hospitalizations for attempted suicide amongst female youth between the ages of 14 and 24 years. According to Nixon, Cloutier, and Jansson (2008, 308) “The most frequent reported forms of nonsuicidal self-harm (descending order) were: self-injury such as cutting, scratching and self-hitting, ingesting a medication in excess of the prescribed or generally recognized dosage, ingesting a recreational or illicit drug or alcohol as a means of self-harm and other nonspecified forms of self-injury.” On the other hand, certain types of suicide may go underreported, as in many cases it may be difficult for a coroner to determine a specific intent to take life.

Assessing suicide attempts is particularly challenging. Many suicide attempts do not result in the individual being hospitalized for treatment because hospitals tend to admit only the most severe cases (Holley, Fick, and Love 1998). Moreover, many suicide attempts may go unreported to the medical system. This leads to a loss of information for reports that depend on such data. Moreover, in this analysis every self-harm-related hospitalization is calculated as a suicide attempt. As there is the possibility of transfers from hospital to hospital or even within wards in a singular hospital the result could lead to over-counting in some instances.

It should also be noted that the validity of comparing suicide rates across jurisdictions and time spans has been questioned. Previous reports have demonstrated variations in provincial suicide rates. Some of these differences may be attributable to different coding practices between jurisdictions. While most provinces share the same definition for suicide, the standard of proof required to make the finding by provincial coroners or medical examiners may be different. Pearson-Nelson, Raffalovich and Bjarnason (2004, 335) noted that “the ICD-10 thus not only offers many more categories of suicide to choose from, but also many more categories of deaths of unknown causes and unknown intent. Cross-national research on the ways in which coroners categorize deaths using new categories would be a valuable contribution to the study of international suicide rates.” They suggest that the implementation of ICD-10-CA is associated with significant decreases in suicide rates internationally.

This document reports the numbers and rates of suicide, both attempted and completed, by age, sex, urban/rural status, average household income quartile, and the extent of contact with select provincial health providers. While these factors are important, other areas of study identified by the Nova Scotia Framework to Address Suicide (November 2006) could not be analysed. This includes ethnicity (specifically First Nations) and sexual orientation. At the time of this report, there were no datasets available that could be used to analyse these cohorts. Although there are codes within the ICD-10-CA system associated with sexual orientation, they are not currently used within the province. The following cohorts of importance in the study of suicide could also not be identified in this report.

- The homeless
- Individuals with a history in the justice system. This would include people with a history within the justice system at a federal or provincial level.
- Recipients of community services/continuing care programming. This would include programs administered by the Department of Community Services and the Department of Health, such as group homes, independent living homes, residential and vocational living providers, home care and support agencies, long term care facilities, and other supportive living arrangements, especially for those with mental disorders. At the time of this report, there was no way, within the parameters of this study, to identify which individuals may or may not have received programming from any of these services.
- Recipients of provincial Pharmacare programming: Several provincially available Pharmacare programs were available for Nova Scotians during the period of this study (for those with diabetes, in lower income brackets, and Pharmacare for seniors and those in long-term care). The use of prescription drugs is important in the field of mental health and suicide prevention. Prescription medication was initially examined for this report; however, results were not deemed to be evaluable due to incomplete data.
- Individuals living in specific communities or within families: Suicide clusters within specific communities were initially examined in the development of this report, and some preliminary findings indicated that suicides occur with higher frequency in specific communities (in certain postal codes and time frames). However, due to low population counts and privacy concerns, these results were omitted. A review of family histories of suicide could not be conducted as there was no way within the health databases to identify family relationships amongst individuals.
- Members of the Canadian Armed Forces: In addition to not being able to identify active members and veterans of the armed forces provincially, the health-care services often used by military personnel in Nova Scotia are under federal jurisdiction, meaning the services used would not be captured by provincial datasets, making this population additionally difficult to study for the purposes of this report.

This report indicates a decrease in hospitalizations for suicide attempts over a 10-year time span. However, it will require additional analysis to determine if this trend represents a change in suicidal behaviour or if it represents a change in coding, reporting, or management practices. To better understand the complexity and impact of suicide on society, it is important to look beyond suicide rates and try to understand the health and environmental factors that can influence suicidal behaviour.

Finally, this report indicates a higher degree of health system contact for mental health services amongst individuals who attempted or completed suicide compared to the overall Nova Scotia population. This report attempted to compare utilization patterns based on severity of mental disorders and health status, and by demographics (e.g., age, sex, income quartile, rural urban status). The report indicated that there were divergences in prior usage of health-care services according to urban/rural status, income quartile, age, sex, age, and severity of mental disorder. However, the report does not indicate how these divergences in usage affected care delivery outcomes or how the utilization patterns were influenced by external factors (e.g., other government programming, families, workplace, etc.). The report is incomplete in that it does not include information on contacts with other government services and/or providers such as correctional services, law enforcement, the legal system, private-practice psychologists, community services programs, housing programs, continuing care providers, school counsellors, employers, provincial Pharmacare programming, and others. Furthermore, it does not assess the level of awareness or the degree and effectiveness of suicide prevention programming amongst health providers.

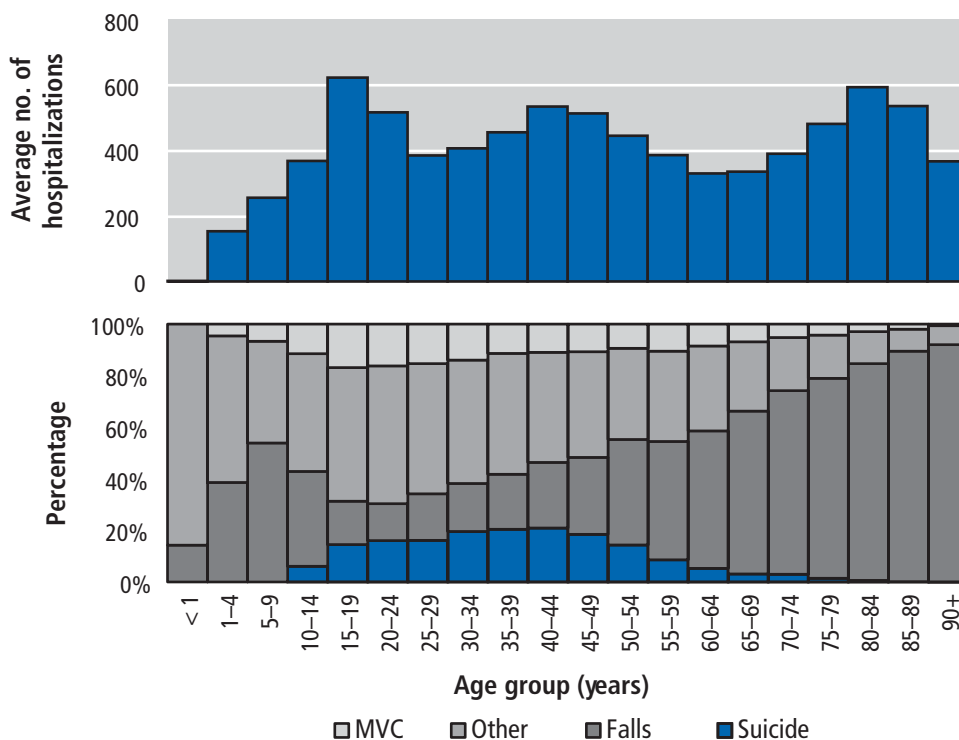
Hospitalizations for Suicide Attempts

Injury-related Hospitalizations in Nova Scotia

An average of 8,085 injuries per year were recorded in Nova Scotia hospital data (excluding medical complications and adverse events) between the years 2001 and 2004. As can be observed from the top graph in **Figure 1**, the largest proportion of injuries peaked among three age groups—15- to 19-year-olds, 40- to 44-year-olds, and 80- to 84-year-olds.

The bottom half of Figure 1 indicates that attempted suicide made up 14% of injury-related hospitalizations amongst 15- to 19-year-olds and that this frequency steadily increased to 20% of injury-related hospitalizations amongst 40- to 44-year-olds. Overall, when the totals were accumulated by all age groups, attempted suicide was the second largest category (after falls) for injury-related hospitalizations across Nova Scotia. Figure 1 represents the accumulated total of both sexes for injury-related hospitalizations.

Figure 1: External cause for injury-related hospitalizations in Nova Scotia (2001–2004)⁴



FACT

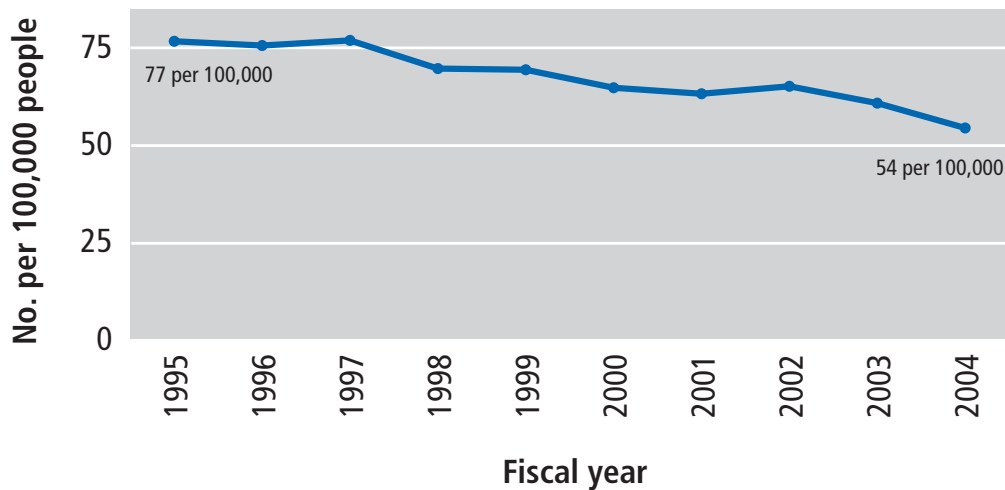
Overall, when the totals were accumulated by all age groups, attempted suicide was the second largest category (after falls) for injury-related hospitalizations across Nova Scotia. (See footnote below for further explanation).

4. Note: The “other” category displayed in the chart is actually an accumulated total of separate types of smaller unintentional injury categories (e.g., by firearms, poisonings, drowning, etc.).

Trends in Hospitalizations for Suicide Attempts (1995–2004)

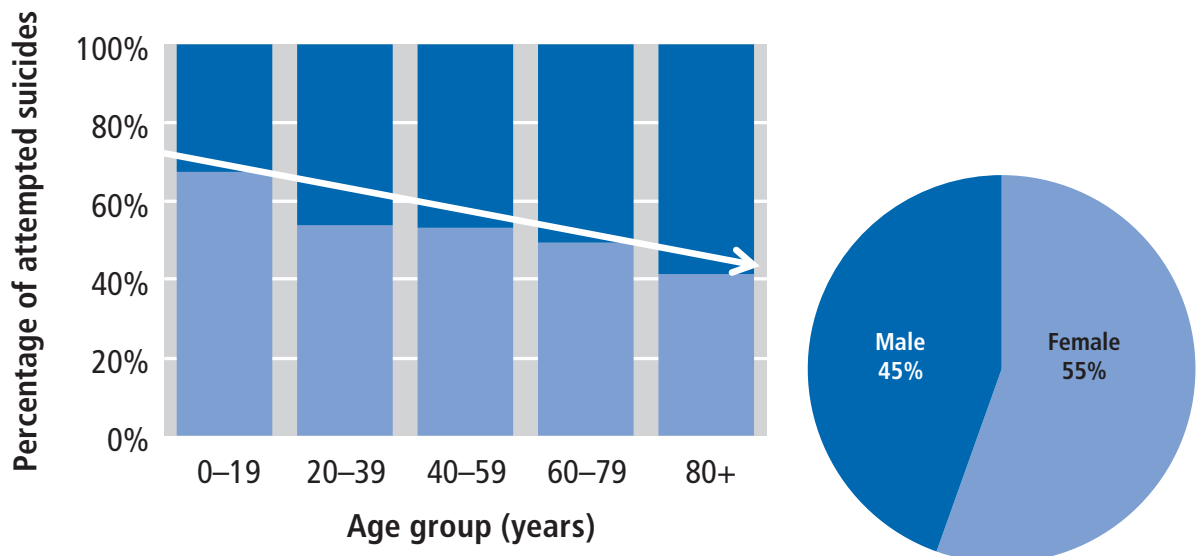
Between the years 1995 and 2004, there were 6,582 admissions for attempted suicide recorded in Nova Scotia hospitals (yearly average of 658). The rate of hospitalization for suicide attempts declined over the 10-year period (**Figure 2**) (p value ≤ 0.05). Although this drop is statistically significant, it should be interpreted with some caution, as the rates of attempted and completed suicide have been declining in many jurisdictions, and it has been argued that it may be the result of changes in coding practices internationally (Pearson-Nelson, Raffalovich, and Bjarnason 2004). Moreover, it could simply mean that fewer attempts actually result in a hospitalization due to changes in hospital management practices.

Figure 2: Hospitalization rates for suicide attempts in Nova Scotia (1995–2004)⁵



Fifty-five per cent of those who were hospitalized for attempted suicide were female (**Figure 3**). The difference was more pronounced among younger age groups. However, as age increased, the disparity between males and females in the number of hospitalizations for suicide attempts declined.

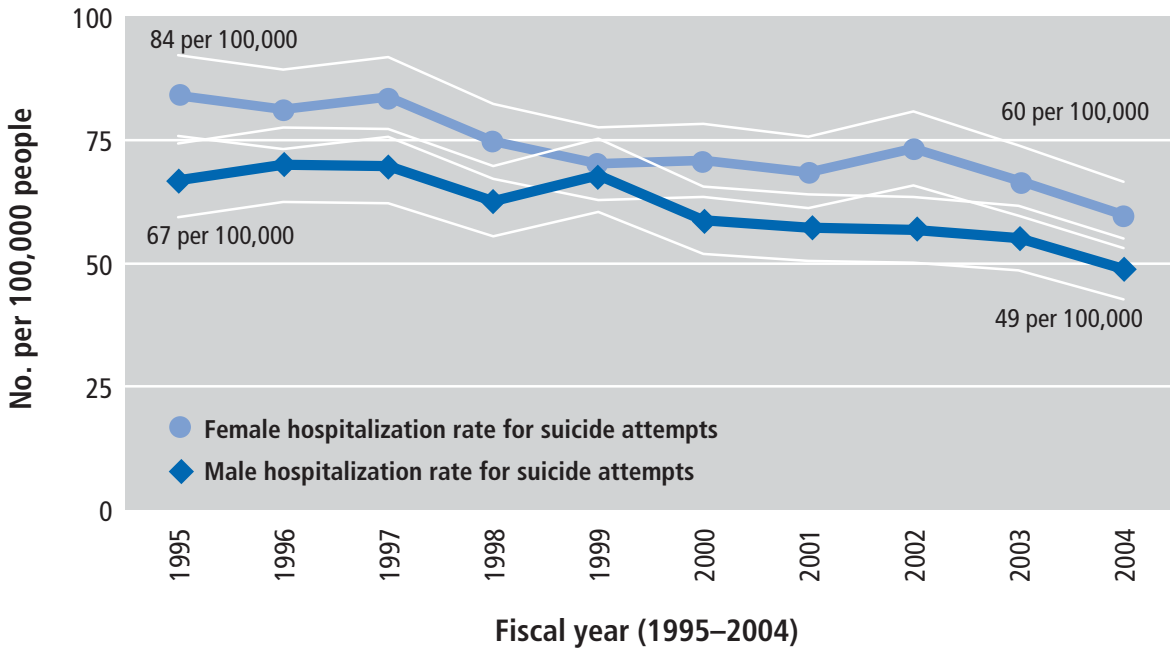
Figure 3: Percent of hospitalizations for suicide attempt by sex (1995–2004)



5. Age-adjusted rates of hospitalizations for suicide attempts were also calculated and did not show a variation in trend from the crude rate.

The rates of hospitalization for suicide attempt by both males and females declined over the 1995–2004 period (p value ≤ 0.05). Females had higher hospitalization rates for suicide attempts than males during the study period (**Figure 4**). In general, women have higher rates of attempted suicide, while men have higher rates of completed suicide (Langlois and Morrison 2002).

Figure 4: Age-adjusted hospitalization rates (with 95% confidence intervals) for suicide attempt by sex in Nova Scotia (1995–2004)



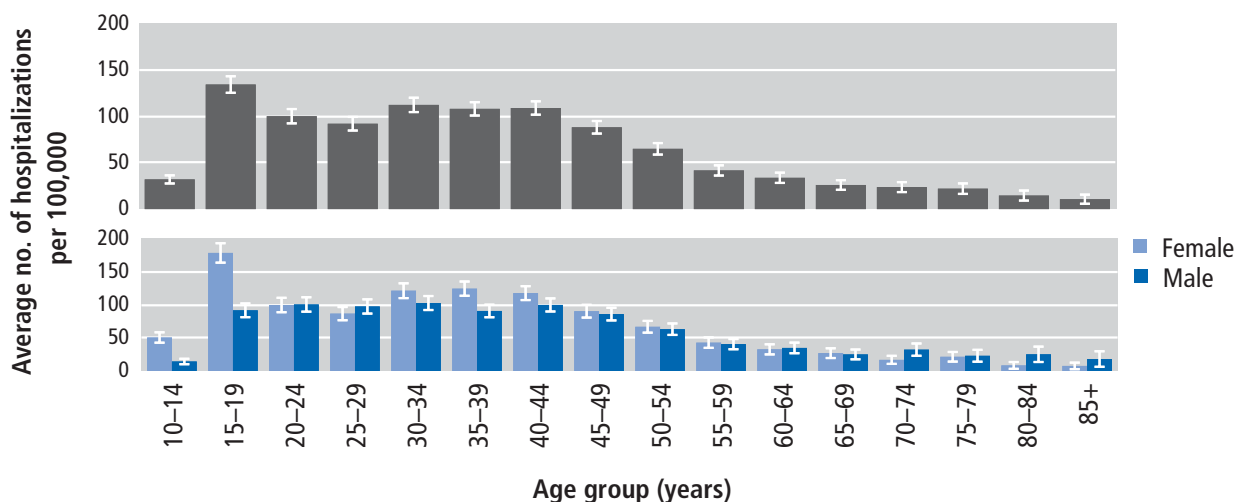
FACTS

- The age-adjusted rate of hospitalization for suicide attempts amongst **females** declined from 84 per 100,000 people in 1995 to 60 per 100,000 people in 2004.
- The age-adjusted rate of hospitalization for suicide attempts amongst **males** declined from 67 per 100,000 people in 1995 to 49 per 100,000 people in 2004.

Age Differences in Hospitalizations for Suicide Attempts

Figure 5 shows the hospitalization rates for suicide attempts by age group and sex. The top half of Figure 5 indicates that 15- to 19-year-olds had the highest rate of any single age group (134 hospitalizations per 100,000 individuals). The bottom half of the figure indicates that females in this age group had a rate of hospitalization almost twice that of males.

Figure 5: Annual hospitalization rate (with 95% confidence intervals) for suicide attempts by age group and sex (1995–2004)



Attempts per Individual Based on Age and Sex

Table 1: Attempts per individual by age and sex (1995–2004)

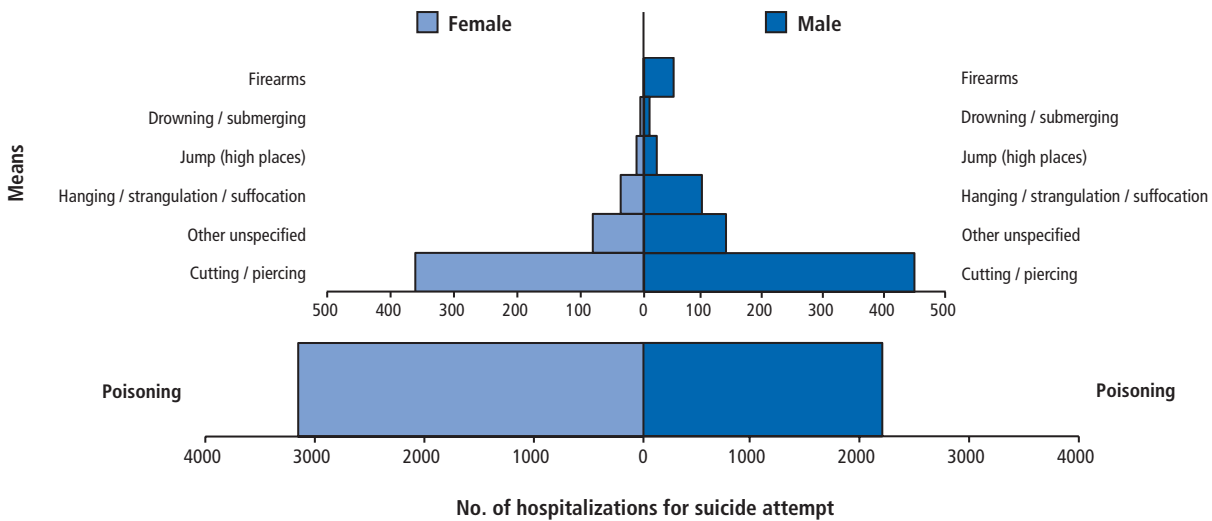
Sex	Age group	No. of individuals	No. of attempts	Attempts per individual
Female	0–19	617	726	1.2
	20–39	1,123	1,574	1.4
	40–59	875	1,148	1.3
	60+	171	202	1.2
	Overall	2,786	3,650	1.3
Male	0–19	317	351	1.1
	20–39	1,030	1,353	1.3
	40–59	815	1,013	1.2
	60+	194	215	1.1
	Overall	2,356	2,932	1.2

Table 1 provides the total number of individuals who attempted suicide, the total number of hospitalizations for attempted suicide, and the ratio between the two in years 1995–2004. As can be observed from the table, the difference in attempts per individual between the age groups was not significant.

Methods of Attempted Suicide

Figure 6 shows by sex the different means of attempting suicide used by individuals who were hospitalized for a suicide attempt. The data indicate that poisoning was the most frequent means of attempting suicide in Nova Scotia, especially among females. Males were numerically more likely than females to be hospitalized for suicide attempts for all other means.

Figure 6: Frequency of hospitalizations for attempted suicide by sex and means (1995–2004)⁶



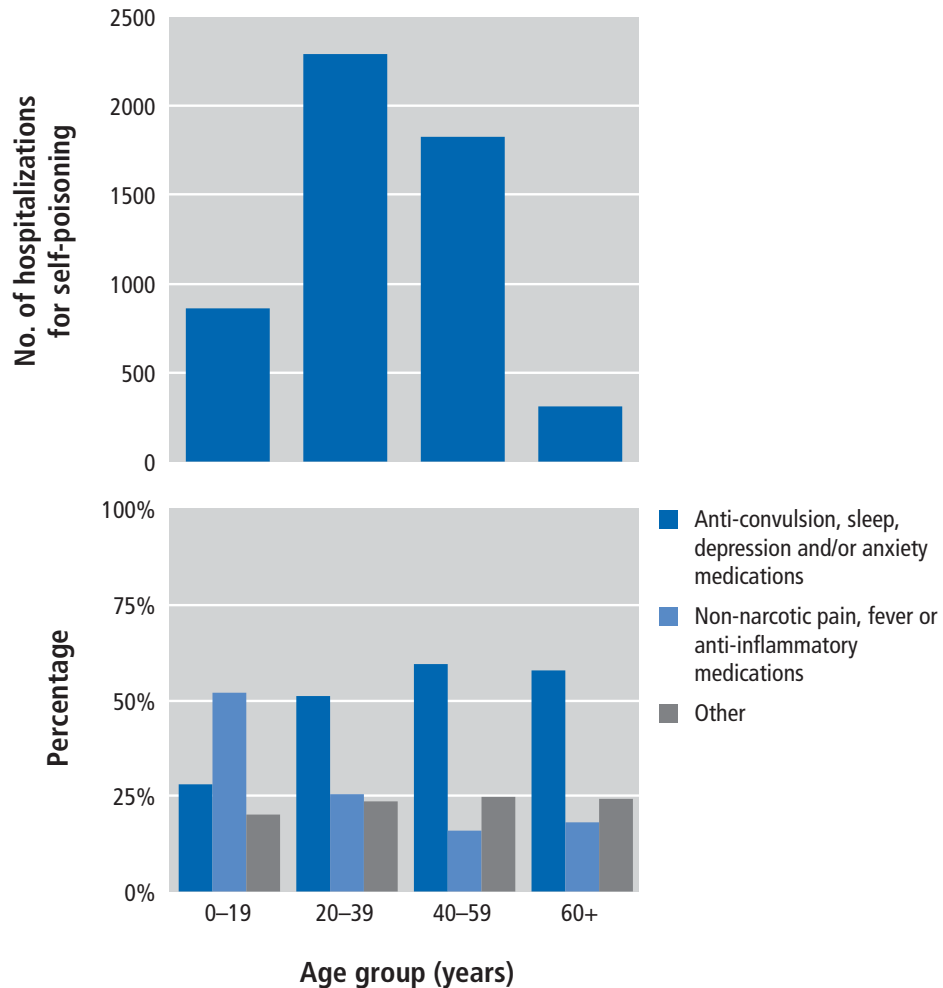
A closer examination of self-poisonings indicated that two subcategories contributed to the majority of hospitalizations. These two categories were “non-narcotic pain, fever, or anti-inflammatory medications” and “anti-convulsion, sleep, depression, and/or anxiety medications.” **Figure 7** demonstrates that there was an age variation between these two categories: non-narcotic pain, fever, or anti-inflammatory pills were numerically used most frequently by teenagers and young adults, whereas older individuals more frequently made use of anti-convulsion, sleep, depression, and/or anxiety medications to attempt suicide. The majority of self-poisonings with anti-convulsion, sleep, depression, and/or anxiety medications were with “tranquillizers and other psychotropic agents.”⁷

FACT

Poisoning was by far the most frequent means of attempting suicide in Nova Scotia. It was the method used in 80% of suicide attempts that resulted in hospitalization.

- It is likely that some of the hospitalizations, particularly for self-poisonings and cutting and piercings, were acts of self-harm, rather than attempted suicides. As previously noted, motive to commit an act is not recorded in the database, so it is difficult to distinguish between acts of self-harm and suicide attempts.
- Eighty-five per cent of self-poisonings with anti-convulsion, sleep, depression, and/or anxiety medications in years 1995–2000 were “tranquillizers and other psychotropic agents.”

Figure 7: Frequency of “non-narcotic pain, fever, or anti-inflammatory medications” and “anti-convulsion, sleep, depression, and/or anxiety medications” in self-poisonings (1995–2004)



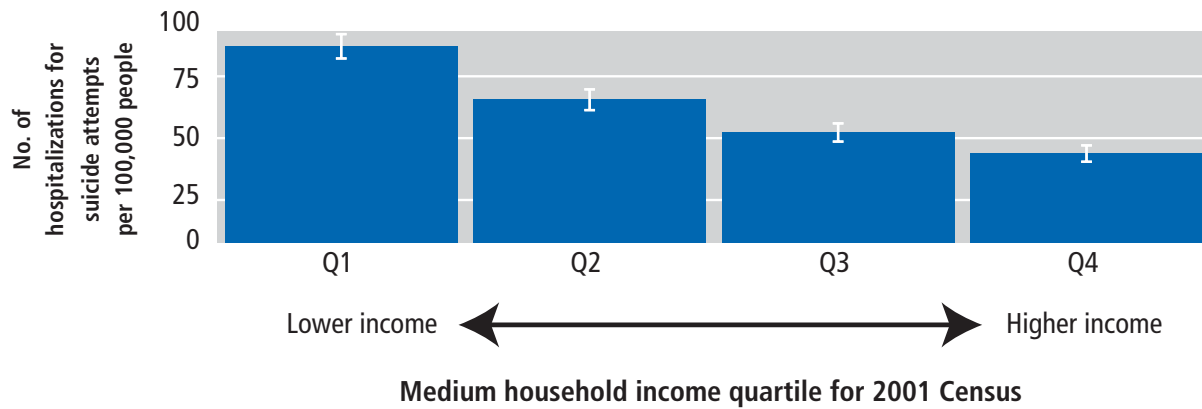
Demographic Factors in Hospitalizations for Suicide Attempts

Median household incomes, obtained from the 2001 Canadian Census for Nova Scotia, were divided into four quartiles (Appendix 3). As can be seen in **Figure 8** on the facing page, rates of hospitalizations for suicide attempts were higher in lower income quartiles than in higher income quartiles. Overall level of income was associated with suicide-related hospitalizations (chi square p value ≤ 0.05)—in other words, there was a statistically significant inverse relationship between income quartiles and the prevalence of hospitalization for a suicide attempt.

FACT

Non-narcotic pain, fever, or anti-inflammatory pills were numerically used most frequently by teenagers and young adults in self-poisonings, whereas older individuals more frequently made use of anti-convulsion, sleep, depression, and/or anxiety medications to attempt suicide.

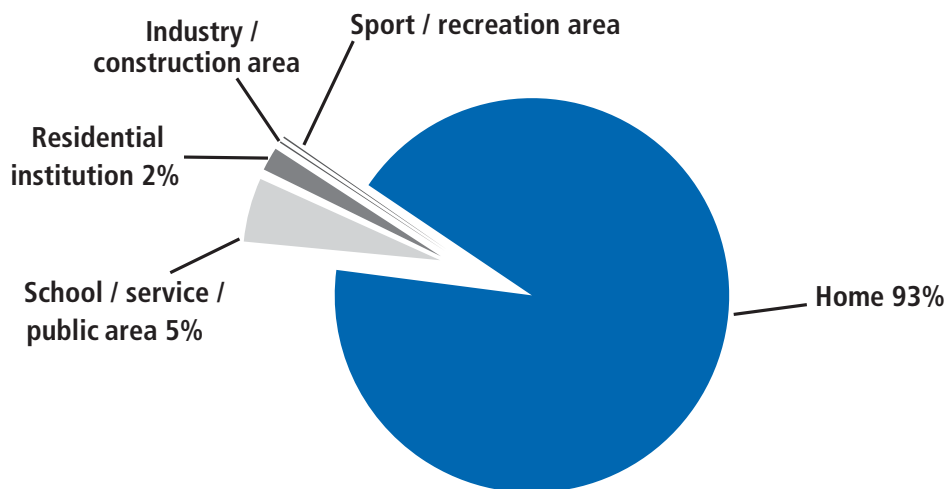
Figure 8: Annual rates of hospitalization (with 95% confidence intervals) for suicide attempts by median household income quartile in Nova Scotia (1995–2004)



Location of Suicide Attempt before a Hospitalization

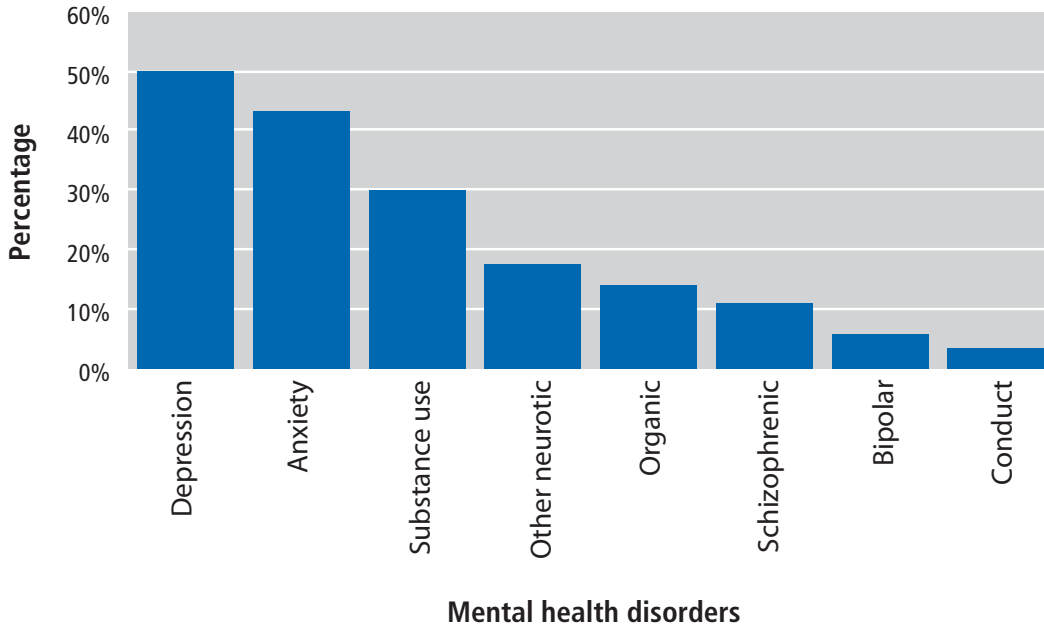
Only 37% of hospitalization records for suicide attempts had known locations specifying where the act occurred (2,489 out of 6,582 suicide attempts). Thus, the results in **Figure 9** should be interpreted with caution. Nevertheless, the figure demonstrates that “home” was the most frequent known location for suicide attempts. Five per cent of attempted suicides occurred in a school, a service, or a public area (which include assembly halls, churches, cinemas, clubhouse, institutions for higher education, libraries, etc.). Two per cent of suicide attempts occurred in a residential institution (which include children’s homes, dormitories, homes for the sick, hospices, military camps, nursing homes, prisons, and reform schools).

Figure 9: Location of a suicide attempt before a hospitalization (1995–2004)



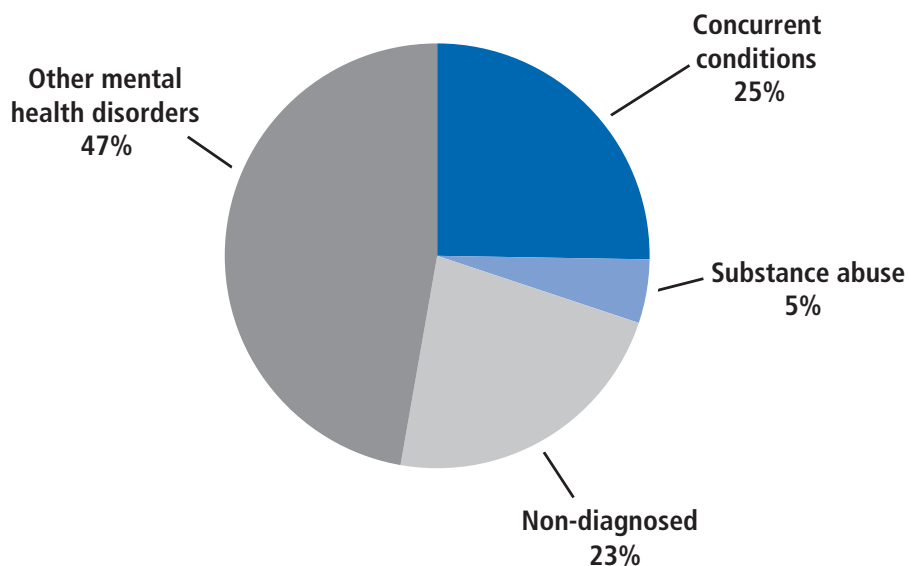
Prior Mental Health and/or Substance Abuse History

Figure 10: Frequency of mental disorder diagnoses prior to hospitalizations for suicide attempts (1995–2004)



Within one year prior to a hospitalization for attempted suicide, 87% of individuals had a prior health service contact for a mental disorder—from a family practitioner, psychiatrist, emergency room, hospital, or mental health clinic. As can be observed from **Figure 10**, depression and anxiety were the most common diagnoses provided prior to a hospitalization for an attempted suicide.

Figure 11: Percentage of attempted suicides with previous “concurrent history” (1995–2004)



In 23% of hospitalizations for a suicide attempt, there was no previous mental health contact one year prior to the attempt. These non-diagnosed cases were more frequently male or rural residents.⁸ In 47% of hospitalizations for a suicide attempt, there was a mental disorder diagnosis without a diagnosis of substance abuse. In 5% of hospitalizations for a suicide attempt, there was a treatment for substance abuse without any other mental disorder diagnosis. In 25% of hospitalizations for a suicide attempt, there was a previous history of substance abuse disorder and other mental disorders that could be described as a “concurrent” condition (**Figure 11**). This meant that there was treatment for both substance abuse and a mental disorder, from various types of providers. Relapse rates for individuals with concurrent conditions are considered to be higher than for individuals with diagnoses in only one category (Skinner et al. 2004). The number of individuals with concurrent diagnoses may be underestimated, as secondary diagnoses are often under-reported.

An age- and sex-adjusted odds ratio was calculated for those who attempted suicide with a history of concurrent disorders and repeat hospitalizations for suicide attempts. The results indicated that those who attempted suicide with a history of concurrent disorders were four times more likely to have been hospitalized for a suicide attempt multiple times, compared to the rest of the population who attempted suicide.⁹

The most frequent specific category for all substance abuse cases was alcohol abuse, followed by other stimulants and opioids (**Table 2**). Substance abuse was highly interrelated with other mental health problems. In suicide attempts with histories of substance abuse problems, 84% had also received treatment for another mental health disorder.¹⁰

Table 2: Number of hospitalizations for suicide attempt with substance abuse history by type (1995–2004)

By substance	No. of suicide attempts with previous SA diagnoses (total 6582 attempts) ¹¹	Percentage of suicide attempts
Alcohol	1004	15.3%
Other stimulants	798	12.1%
Opioids	189	2.9%
Sedatives or hypnotics	75	1.1%
Cocaine	59	0.9%
Cannabinoids	28	0.4%
Multiple drug use and use of other miscellaneous substances	622	9.5%
Total	1975	30%
Percentage of substance abusers with other mental disorders: 84%		

8. Hospitalizations for suicide attempts by individuals without previous mental disorder diagnoses were more common among males and rural residents. Binary logistic regressions were conducted on hospitalizations for suicide attempts without mental disorder contacts by “sex” and urban/rural status. Both of these tests were statistically significant (p-value ≤ 0.05 in years 1995–2004).
9. Confidence interval values were [mean (4.074), lower end (3.499), higher end (4.73), p-value was less than 0.05]. A crude odd ratio was also calculated, which did not show a significant variation in value.
10. In 30% of hospitalizations for a suicide attempt there was a previous history of substance abuse see Figure 11 (25% were concurrent + 5% only received treatment for substance abuse). 25%/30%=84%
11. Substance abuse total does not add up as individuals can be in more than one category.

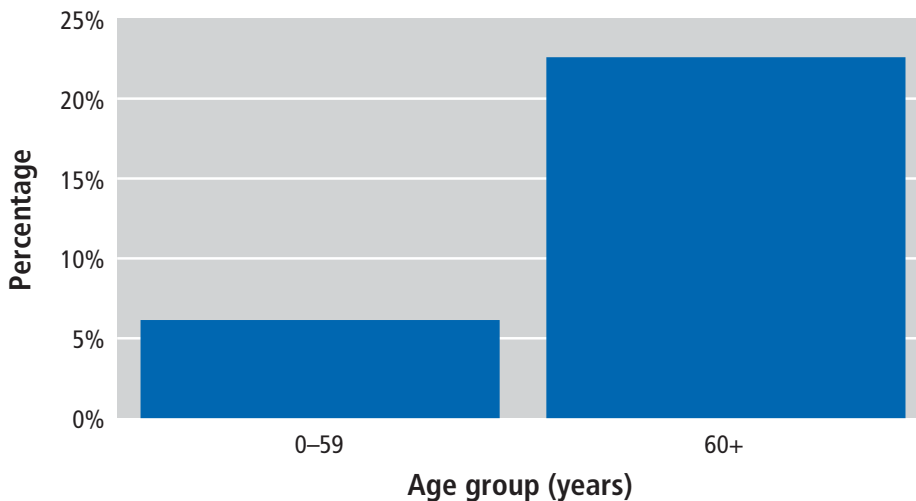
FACTS

- Individuals who were hospitalized for a suicide attempt with a concurrent history were four times more likely to have been hospitalized for a suicide attempt multiple times, compared to those hospitalized for a suicide attempt without a concurrent history during years 1995–2004.
- In 84% of suicide attempts with a prior history of substance abuse, there was also a history of treatment for mental disorders.

Prior Health Care Usage

Seven per cent of hospitalizations for attempted suicide by individuals under the age of 60 had a previous hospitalization for a reason other than that of mental disorders. For individuals 60 and older, 23% had a previous hospitalization for “another reason”—other than for mental disorders (**Figure 12**). These “other reasons” would include other ailments such as chronic diseases, infectious diseases, or other causes of hospitalization not coded as a mental disorder. Mental disorder often co-occurs with other serious illnesses such as chronic diseases especially amongst seniors. (Public Health Agency of Canada 2006)

Figure 12: Frequency of previous hospitalization for non-mental disorders one year prior to a hospitalization for a suicide attempt



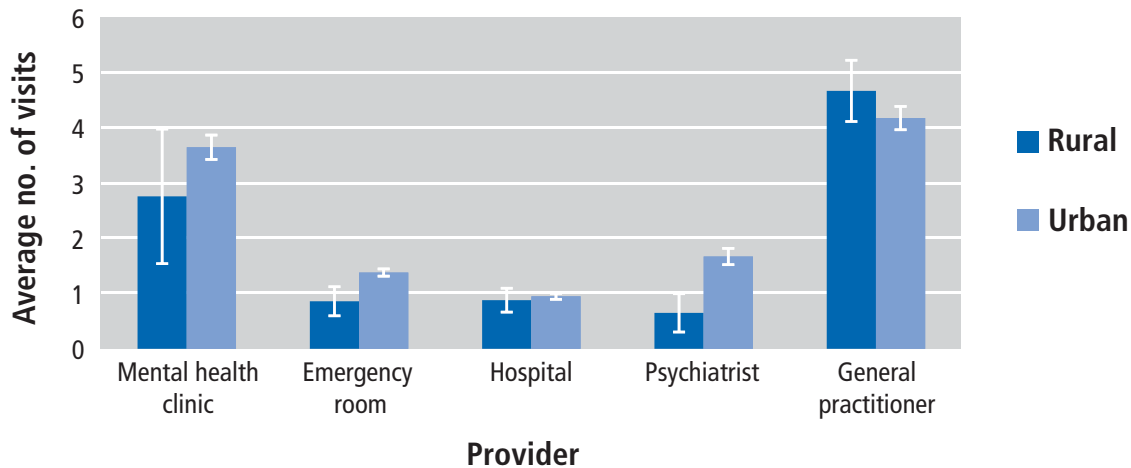
It should be noted that Figure 12 provides only previous information on hospitalizations for other reasons. The full degree of other illnesses that co-occur with individuals prior to their suicide attempt cannot be deduced from this chart. It would, however, show the degree of other health problems requiring a hospitalization.

FACT

Mental disorder often co-occurs with other serious illnesses such as chronic diseases especially amongst seniors.

One year prior to a hospitalization for attempted suicide, individuals utilized various health-care services (mental health clinics, psychiatrists, general practitioners, emergency rooms, hospitals) for mental disorders with varying degrees of frequency. General practitioners were the most heavily accessed provider, followed by services through a mental health clinic. **Figure 13** breaks down the average number of mental disorder contacts of those who were hospitalized for a suicide attempt one year prior to the attempt according to urban/rural status. As can be observed from the figure, the difference in frequency of visits to general practitioners, mental health clinics, or hospitals according to rural/urban status was not substantially different (p values > 0.05). The confidence intervals indicate that the differences in frequency are beyond the margin of error and do not indicate significant differences in the frequency of use for these services. However, one year prior to a hospitalization for attempted suicide, rural individuals made significantly less use of emergency room services and psychiatric services than those hospitalized for suicide attempts in urban residences (p values ≤ 0.05).

Figure 13: Average number of mental health contacts (with 95% confidence intervals) one year prior to hospitalization for suicide attempt, by rural/urban status (1995–2004)

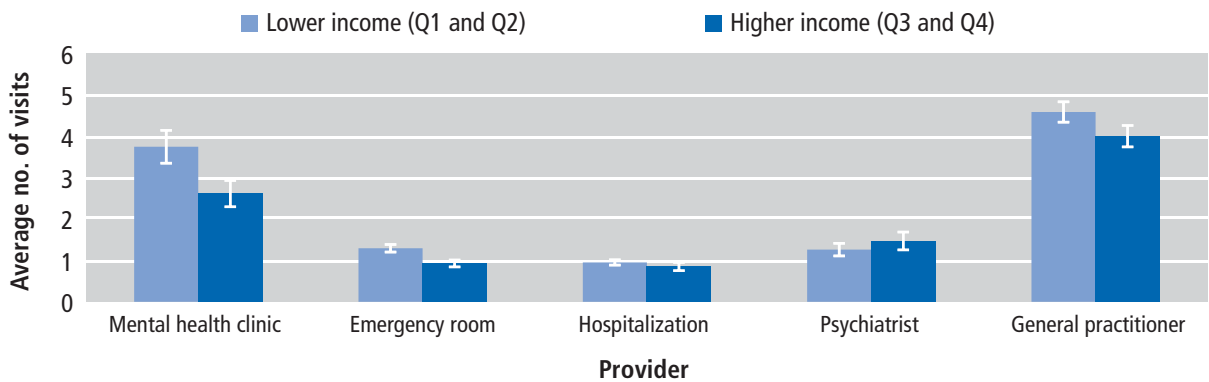


FACT

One year prior to a hospitalization for attempted suicide, rural individuals made significantly less use of emergency room services and psychiatric services for a mental disorder than those in urban residences hospitalized for suicide attempts.

Similarly, **Figure 14** breaks down the average number of mental disorder contacts of those who were hospitalized for a suicide attempt one year prior to the attempt, this time according to residential income quartiles. As can be observed from the figure, there was no significant difference in prior use of services for hospitalizations or psychiatrist visits according to income quartiles prior to a suicide attempt (p values > 0.05). However, one year prior to a hospitalization for attempted suicide, those in lower income quartiles visited mental health clinics, emergency rooms, and general practitioners more frequently than those in higher income quartiles (p values ≤ 0.05).

Figure 14: Average number of mental health contacts (with 95% confidence intervals) one year prior to hospitalization for suicide attempt, by income quartiles (1995–2004)



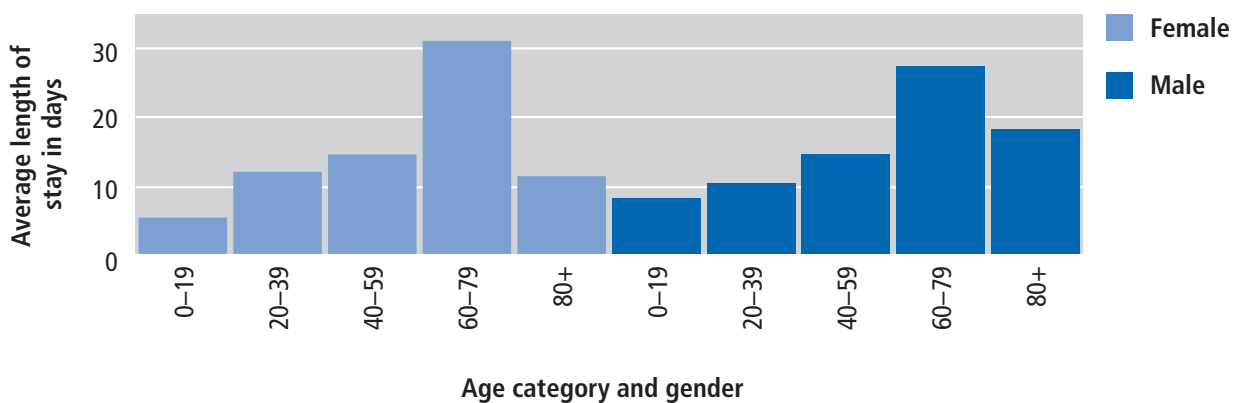
FACT

One year prior to a hospitalization for attempted suicide, those in lower income quartiles visited mental health clinics, emergency rooms, and general practitioners more frequently for a mental disorder than those in higher income quartiles.

Length of Stay for Hospitalizations for Suicide Attempts

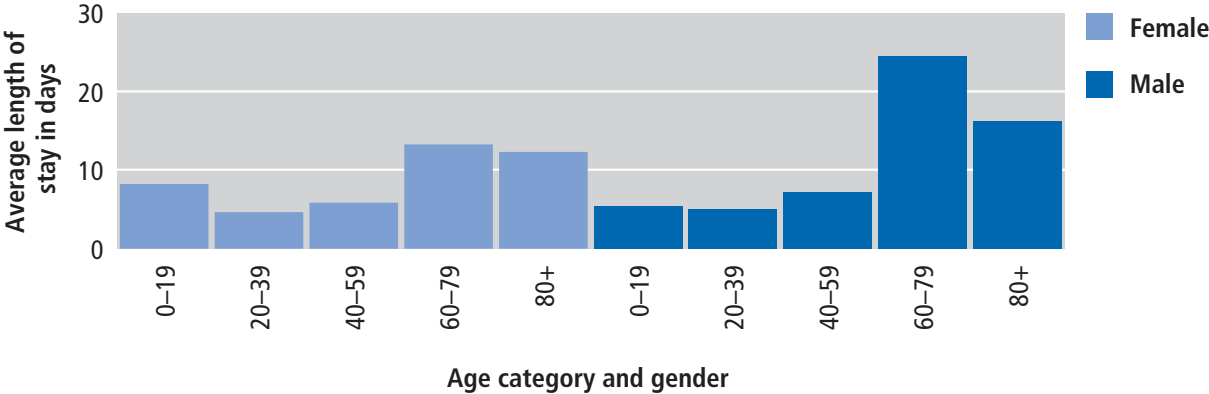
An acute psychiatric unit is defined as a setting serving those in a psychiatric crisis with immediate care in a hospital environment. **Figure 15** provides the average length of stay within an acute psychiatric unit for attempted suicide by sex and age. Females between the ages of 60 and 79 had the longest average length of stay in hospital with, on average, over 30 days of hospitalization. Males in the same age group had the second highest lengths of stay (average of 28 days).

Figure 15: Average length of stay by sex and age for suicide attempts within an acute psychiatric setting (1995–2004)



In a non-psychiatric medical setting, senior males had the longest average lengths of stay (average of 24 days) for a suicide attempt (Figure 16).

Figure 16: Average length of stay by sex and age for suicide attempts within a non-psychiatric setting (1995–2004)

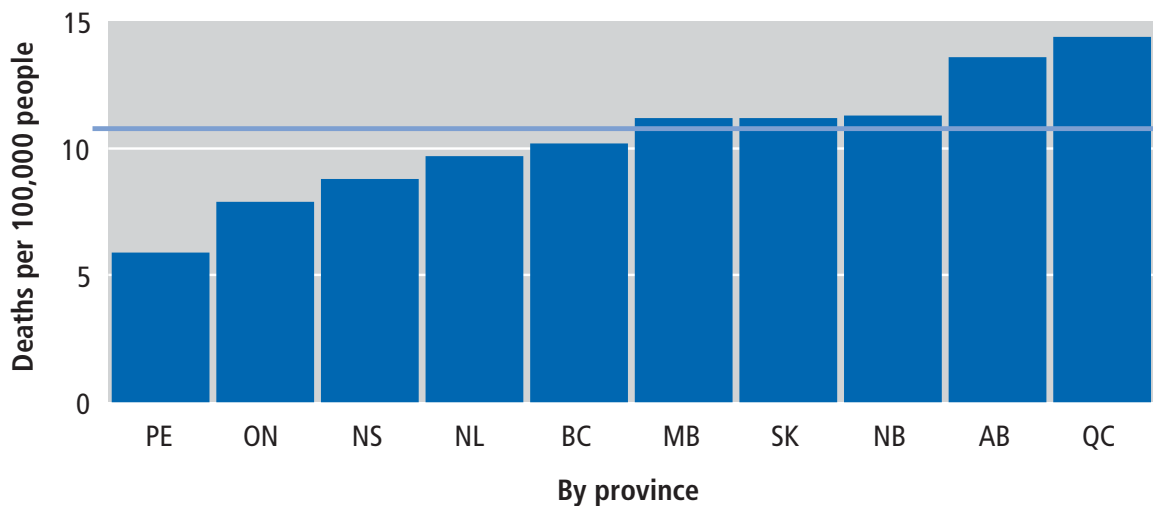


Mortality Due to Suicide

Deaths by Suicide: The National Context

Nova Scotia's suicide rate in 2004 of 9 per 100,000 population was below the national average of 11 per 100,000 population, according to data compiled through Statistics Canada (Statistics Canada n.d.) (Figure 17). Nova Scotia's suicide rate was not significantly different from Ontario, Prince Edward Island, British Columbia, Saskatchewan, and Manitoba. The dark line in the centre of the chart indicates the national average.

Figure 17: Age-adjusted suicide rates selected Canadian provinces (2004)



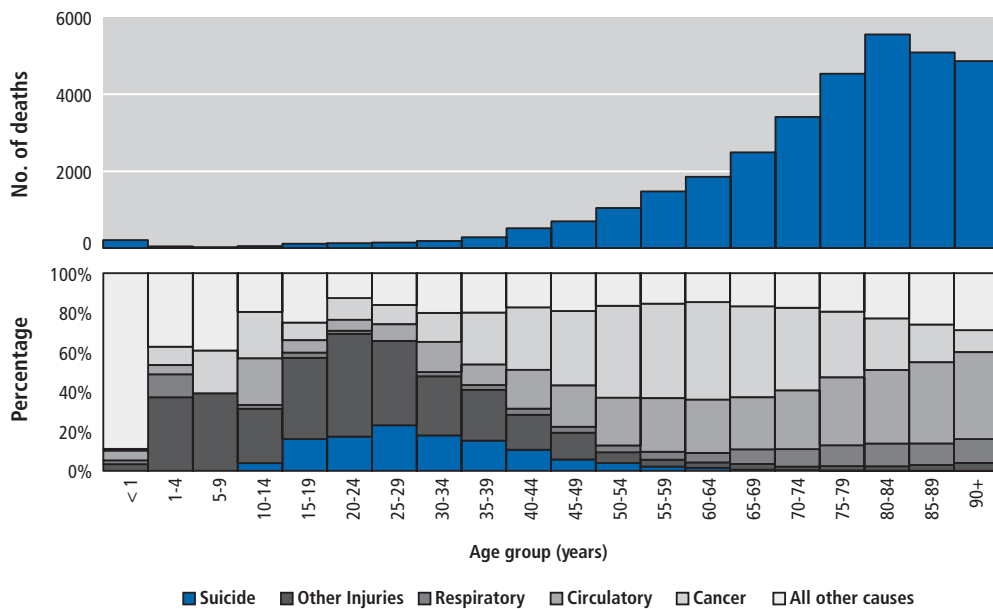
Overall Mortality in a Provincial Context (2001–2004)

There were 36,669 mortalities (all causes) amongst all ages between fiscal years 2001 and 2004 in Nova Scotia—an average of over 8,165 deaths per year. As indicated in the top half of Figure 18, the number of deaths increased steadily with age, and most deaths occurred in individuals who were 70 years of age or older. The second half of Figure 18 provides a frequency of death by cause of death for each age category. Overall suicide was not a frequent cause of death. However, the figure demonstrates that suicide frequency as a cause of death was most pronounced amongst those aged 15-44.

FACT

Nova Scotia's suicide rate (9 per 100,000 individuals) was lower than the national average (11 per 100,000 individuals) in 2004.

Figure 18: External cause for all deaths in Nova Scotia (2001–2004)



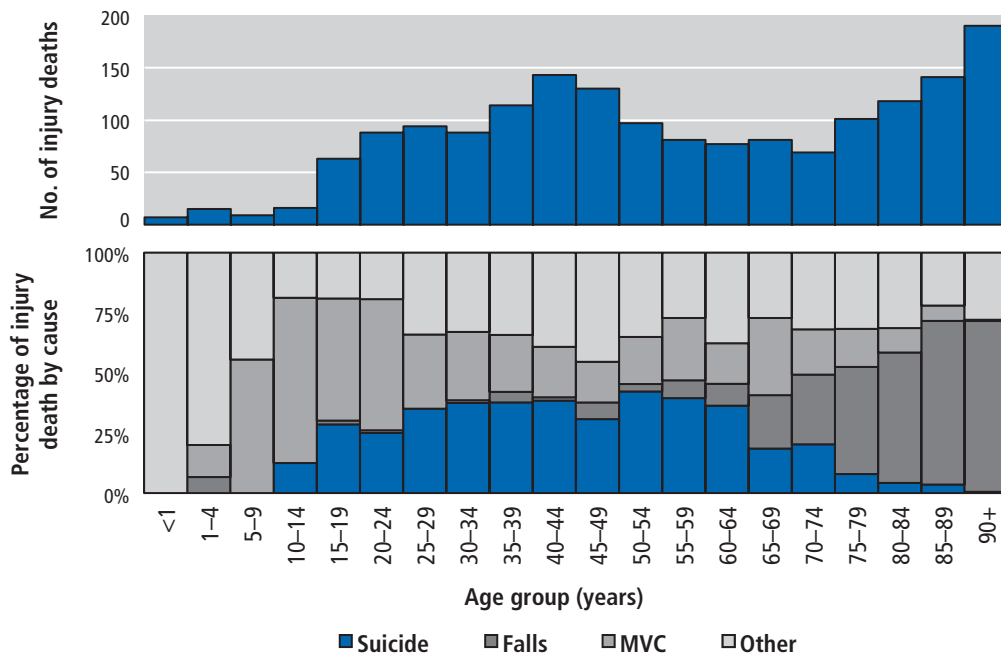
FACT

Suicide frequency as a cause of death was most pronounced amongst those aged 15–44.

Injury-related Deaths in Nova Scotia

There were 1,781 injury-related deaths amongst all ages between fiscal years 2001 and 2004, an average of just under 445 injury-related deaths per year. As can be seen in **Figure 19**, injury-related deaths increased substantially in the 15- to 19-year age group, continued to rise until the mid-40s, declined slightly until the mid-60s, and then increased again until they peaked in the oldest age group (90+). The second half of Figure 19 provides a frequency of injury-related deaths by cause of death for each age category.

Figure 19: External cause for injury deaths in Nova Scotia (2001–2004) (excluding medical complications)



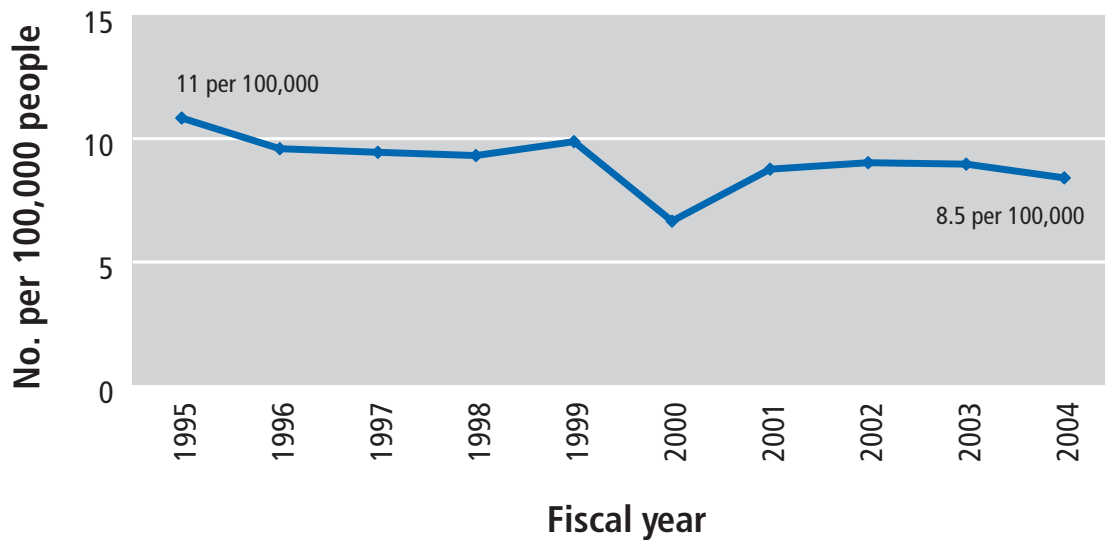
FACT

The Canadian Institute for Health Information reported in 2001 that in Canada “there were 1,012 deaths due to suicides and self-inflicted injuries (including poisonings) in 1998–99. The majority (79%) of these suicide-related deaths was among men and the mean age of death was 44.” (Canadian Institute for Health Information 2001)

Overall Trends in Completed Suicides (1995–2004)

There were 885 suicide deaths recorded in the provincial vital statistics registry during the years 1995–2004 (an annual average of 88.5). The rate declined over the 10-year period (Figure 20); however, this decline was not found to be statistically significant ($p>0.05$).¹²

Figure 20: Age-adjusted rates for suicide-related mortality in Nova Scotia (1995–2004)



FACT

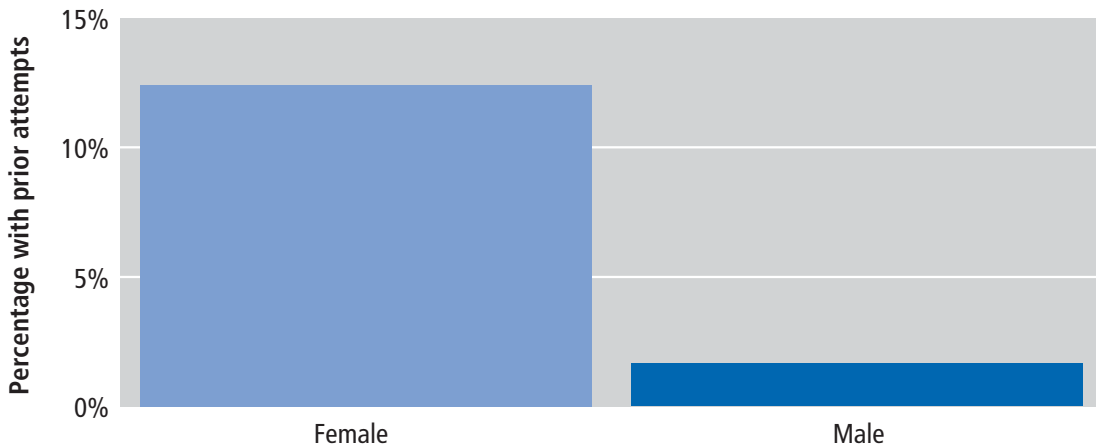
The rate of suicide death in Nova Scotia declined from 11 per 100,000 individuals in 1995 to 8.5 per 100,000 individuals in 2004. This decline was not statistically significant.

12. Age-adjusted rates of completed suicide were also calculated and did not show a variation in trend from the crude rate.

History of Prior Attempts of Completed Suicides (1995–2004)

A greater percentage of females were hospitalized previously for a suicide attempt prior to completing suicide than males (**Figure 21**).

Figure 21: Frequency of previous history of hospitalizations for suicide attempt prior to death (1995–2004)



Sex Differences in Completed Suicides

Numerically, 84% of those who completed suicide in the years 1995–2004 were male (**Figure 22**). Males more frequently used means with greater lethality, such as firearms, to complete a suicide, while females tended to choose less immediately lethal means, such as poisoning. **Figure 23** shows the rates of suicide for males and females in Nova Scotia per 100,000 residents during the fiscal 1995–2004 timeframe (the declines observed in the chart were not statistically significant). This sex difference in the percentage of attempted versus completed suicides is a consistent trend across Canada and much of the industrialized world. In general, women have higher rates of attempted suicide, while men have higher rates of completed suicide.

Figure 22: Percent of suicides by sex (1995–2004)

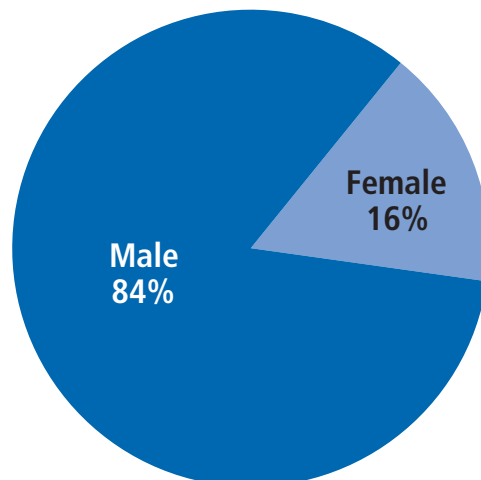
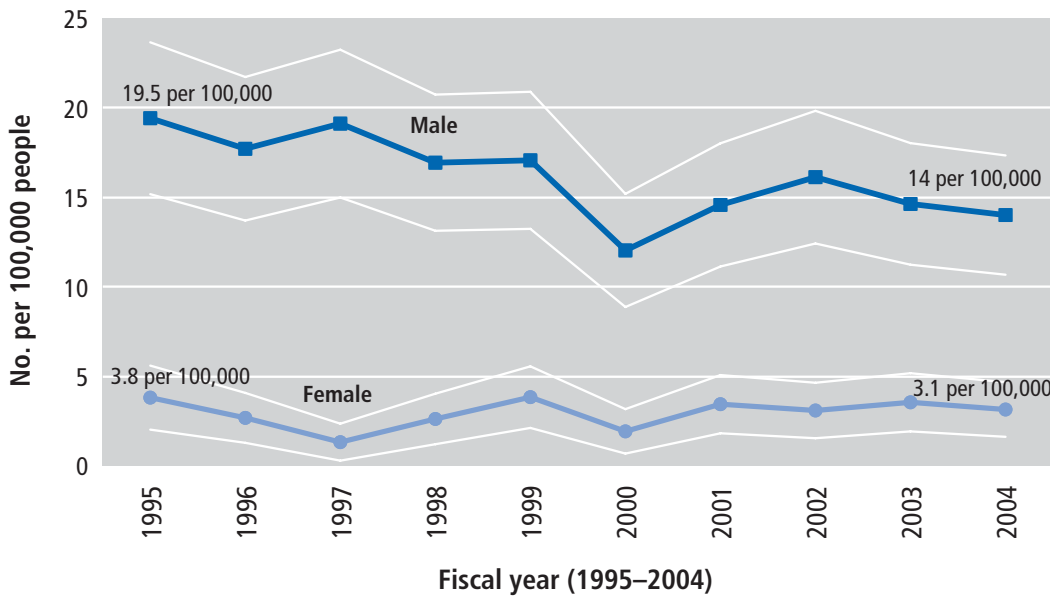


Figure 23: Age-adjusted suicide rates (with 95% confidence intervals) by sex in Nova Scotia (1995–2004)

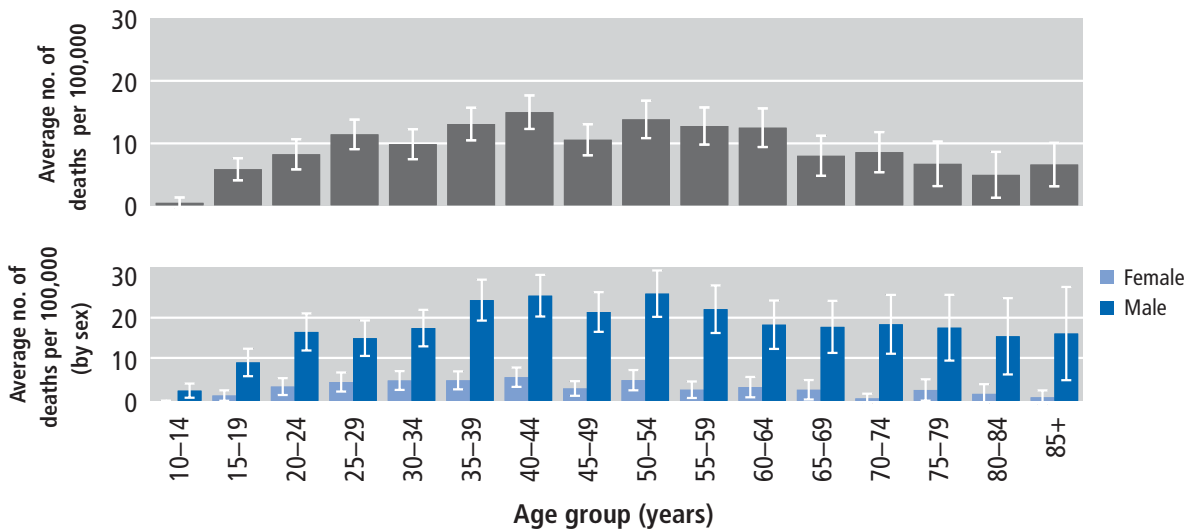


FACT Males accounted for 84% of all suicide deaths between 1995 and 2004, even though 55% of hospitalizations for suicide attempts were female.

Age Differences in Completed Suicide

Figure 24 provides death rates due to completed suicide by age group. Males between 50 and 54 years of age had the highest rate of completed suicide, at over 25 deaths per 100,000. The highest female age category was between the ages of 40 and 44, at 6 deaths per 100,000.

Figure 24: Annual death rate (with 95% confidence intervals) for suicide by age group and sex (1995–2004)



FACT Rates of suicide were highest amongst males between the ages of 35 and 59.

The higher proportion of males completing suicide is consistent with ratios across Canada and most western countries.

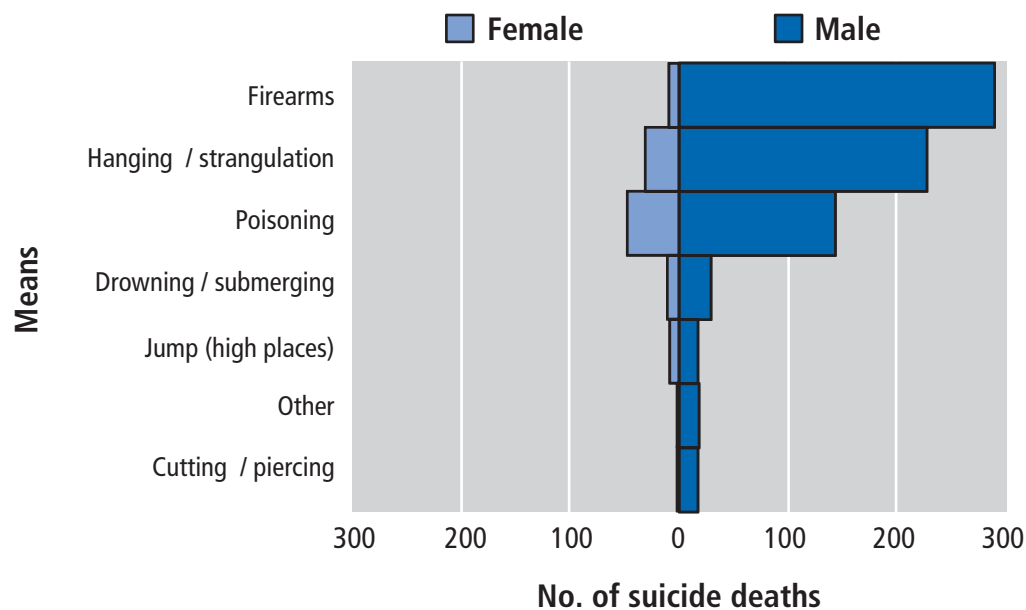
- In Nova Scotia the male-female ratio for completed suicide is approximately 4.5 to 1.
- Throughout Canada the ratio has generally been around 4 to 1 (Langlois and Morrison 2002).
- Amongst western countries the male-female ratio has ranged from 2 to 1 in the Netherlands to 7 to 1 in Greece (Langlois and Morrison 2002).

Methods of Completing Suicide

Figure 25 provides a distribution of the methods used to complete suicide in Nova Scotia by sex. Among men, firearms were the most frequent means of completing suicide. Ninety-six per cent of suicide deaths by firearms were completed by males. Hanging, strangulation, or suffocation was the second most frequent means of suicide; most of these were hangings.¹³ Poisoning was the third most frequent cause of suicide death.

As can be observed in Figure 25, the methods used in completed suicides differ from those used in attempted suicide (Figure 6, p. 19). This is largely because certain methods have a much higher degree of lethality. In other words, some methods are used less frequently in suicide attempts, but have a very high likelihood of causing death.

Figure 25: Frequency of suicide deaths by sex and method 1995–2004



FACT

Ninety-six per cent of suicide deaths by firearms were completed by males.

13. Ninety-eight per cent of this category was estimated to be hanging, while 2% was estimated to be suffocation by plastic bag. Unlike the ICD-9 coding system, the ICD 10 system does not divide the hanging, strangulation, and suffocation category of suicide into sub-categories. Therefore, dividing this category into sub-categories was possible only for suicides between the years 1995 and 1999.

Table 3: Estimated lethality of suicidal methods in Nova Scotia (1995–2004)

Method of suicide attempt	Percentage of suicide attempts resulting in death
Firearms	88%
Drowning/submerging	74%
Hanging/strangulation/suffocation	70%
Jumping from high places	42%
Poisoning—overall	4%
Poisoning by type	
• motor vehicle exhaust/other gases and vapours	62%
• other and unspecified drugs, medicaments, and biological substances	8%
• anti-convulsion, sleep, depression, and/or anxiety medications	1%
• non-narcotic pain, fever, or anti-inflammatory medications	1%
• other	3%
Cutting/piercing	3%

It is possible to estimate the lethality of suicidal methods provincially by dividing the number of suicide deaths in each category by the total number of attempts in that category.¹⁴ As can be observed from **Table 3**, when a firearm was used in a known suicide attempt, approximately 88% of cases resulted in death. Overall, there was a only a 4% chance of death for individuals who used poisoning as their method of attempted suicide; however, the inhalation of motor vehicle exhaust and other gases, while used less frequently than other poisonings in attempted suicide, had a high degree of lethality.

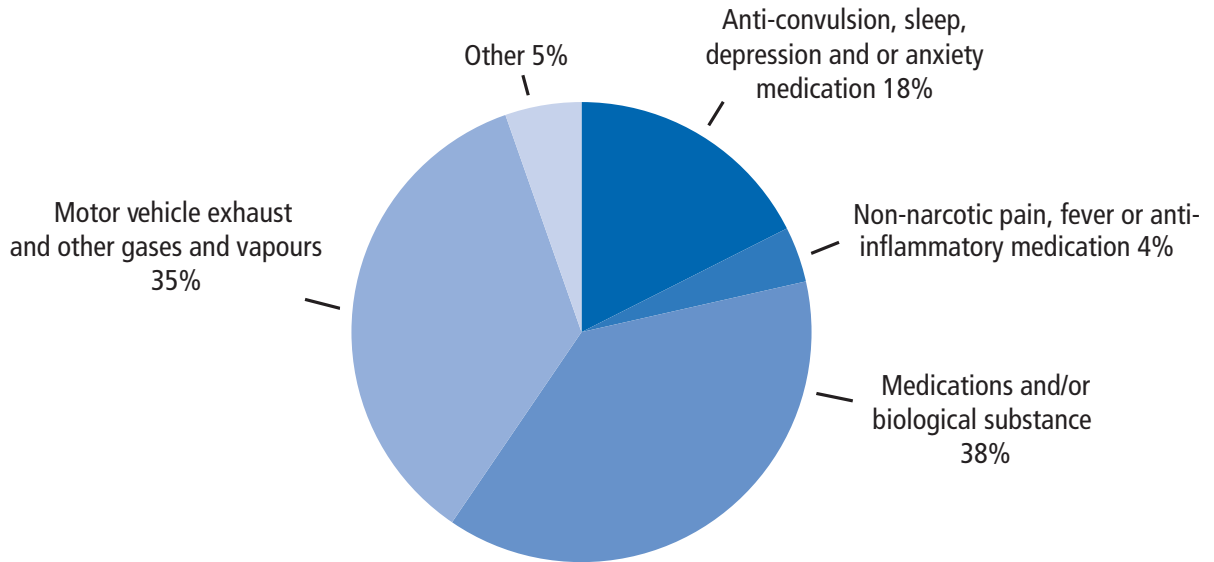
Approximately 81% of suicide deaths caused by a firearm were unknown discharges. The other 19% were caused by a shotgun, hunting rifle, or large firearm. There were no known handgun discharges recorded. Access to firearms has been identified as a risk factor for suicide in rural areas (Dresang 2001). There is research demonstrating that homes with guns are five times more likely to be the scene of a suicide death than homes without guns (Kellermann et al. 1993). Hanging was also a lethal form of suicide and, unlike firearms or drugs, is a more readily accessible means. For this reason, hanging has been a frequent method of suicide among young adults and individuals in controlled environments such as prisons or correctional services. Age and urban/rural status were also factors that influenced the method by which individuals made a suicidal act.¹⁵

14. Estimate of total suicidal episodes is calculated by adding hospitalizations for suicide attempt by cause with the total number of suicide deaths by cause. Lethality of means = $\frac{\text{deaths by suicide}}{[\text{hospitalizations for attempted suicide} + \text{deaths by suicide}]}$.

15. Individuals who attempted or completed suicide and who were over the age of 59 or living in rural areas were more likely to use a firearm in a suicide act (hospitalizations for suicide attempt + suicide completions), during years 1995–2004. Two binary logistic regressions were conducted to assess the validity of the relationship between those over 59 and urban/rural status on firearms use in suicide acts. Both of these tests showed a significant relationship with firearms usage (p-values ≤ 0.05).

Nearly a third of all self-poisoning deaths were due to carbon monoxide poisoning by means of motor vehicle exhaust or other gases and vapours (**Figure 26**), 38% were from medications and biological substances, and 18% were from anti-convulsion, sleeping disorder, depression/anxiety drugs.

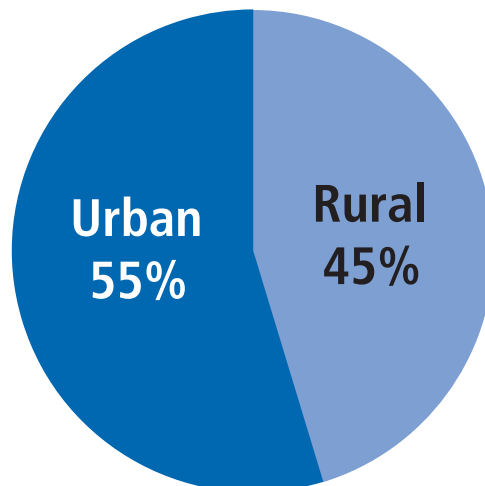
Figure 26: Percentage of self-poisoning deaths by type (1995–2005)



Suicide and Socio-demographic Factors

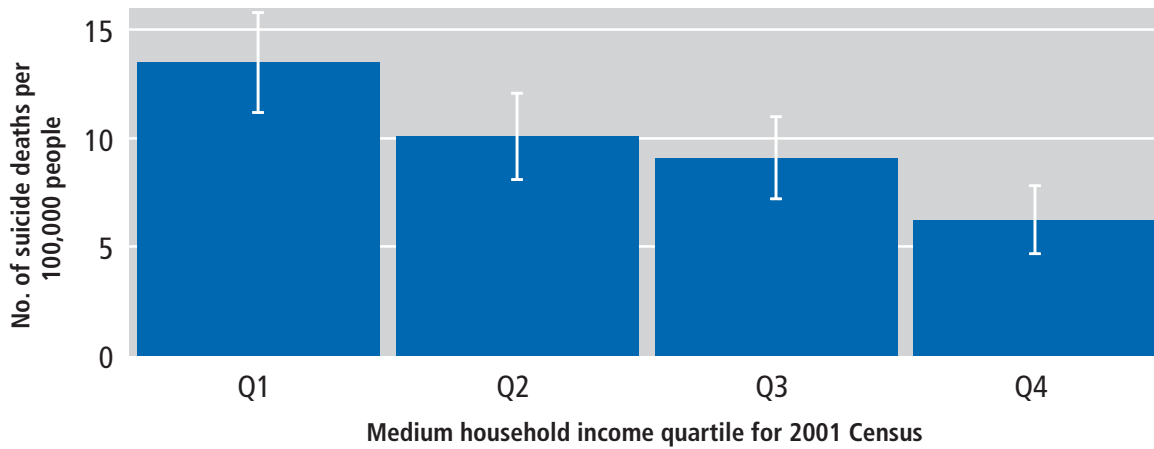
While individuals in rural and urban settings utilized different methods to complete suicide, **Figure 27** indicates that the number of completed suicides is approximately similar to the distribution of urban and rural residents in Nova Scotia. Fifty-five per cent of completed suicides occurred in urban areas, while 45% occurred in rural areas, which is very similar to the urban/rural frequency of Nova Scotians as defined in this study.

Figure 27: Frequency of rural and urban completed suicides in Nova Scotia, (1995–2004)



The lowest income quartile had a significantly higher suicide death rate compared to the highest income quartile (**Figure 28**) (see Appendix 3 for income quartile breakdown). Chi-square test indicated that suicide deaths were associated with income (chi square p value > 0.05).

Figure 28: Annual age-adjusted rates for suicide deaths (with 95% confidence intervals) by median household income quartile in Nova Scotia (1995–2004)

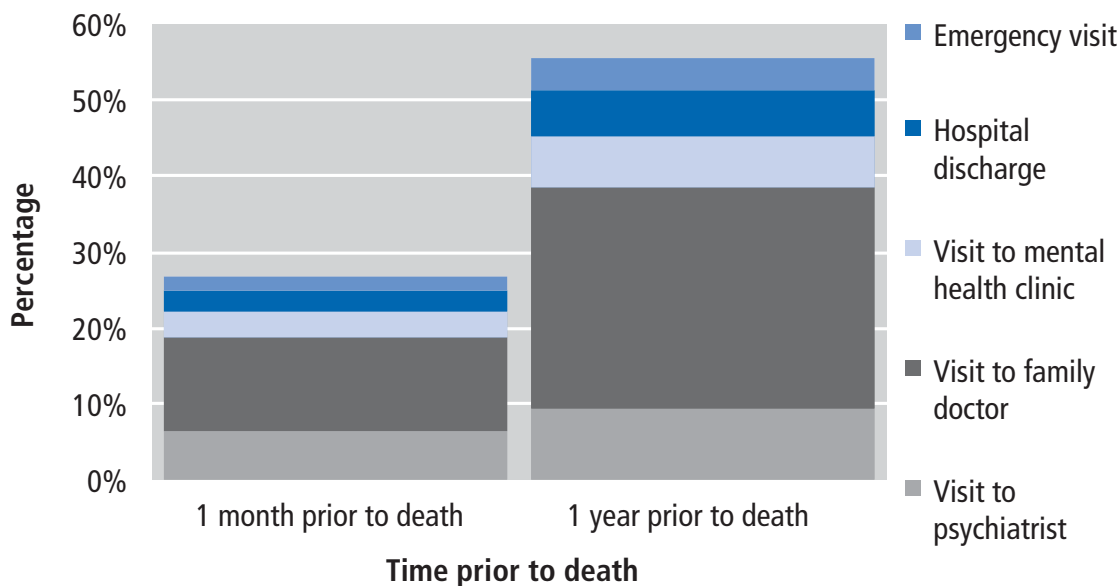


Suicide, Mental Health, and the Health System

Most Recent Mental Health Disorder Contact Prior to Suicide

Between 1995 and 2004, 27% of individuals who completed suicide had a last mental disorder contact with health providers within one month preceding their death, and 55% had a mental disorder contact within one calendar year preceding death (Figure 29). As observed in Figure 29, the most frequent final mental disorder contact prior to death was with family doctors or psychiatrists. Although the fact that individuals who complete suicide are likely to seek care close to the event is a necessary condition for clinicians to intervene, it may not be sufficient (Pirkus and Burgess 1998, 472). Some studies have found that visits by suicidal patients to their family physician prior to their suicide often involve simply receiving a repeat prescription (Obafunwa and Busuttill 1994, 428–32). Thus, a better understanding of the extent and nature of final contacts prior to death is necessary to establish if modifiable risk factors were apparent.

Figure 29: Most recent mental disorder contact with health system providers for individuals who completed suicide (1995–2004) by time frame and provider type



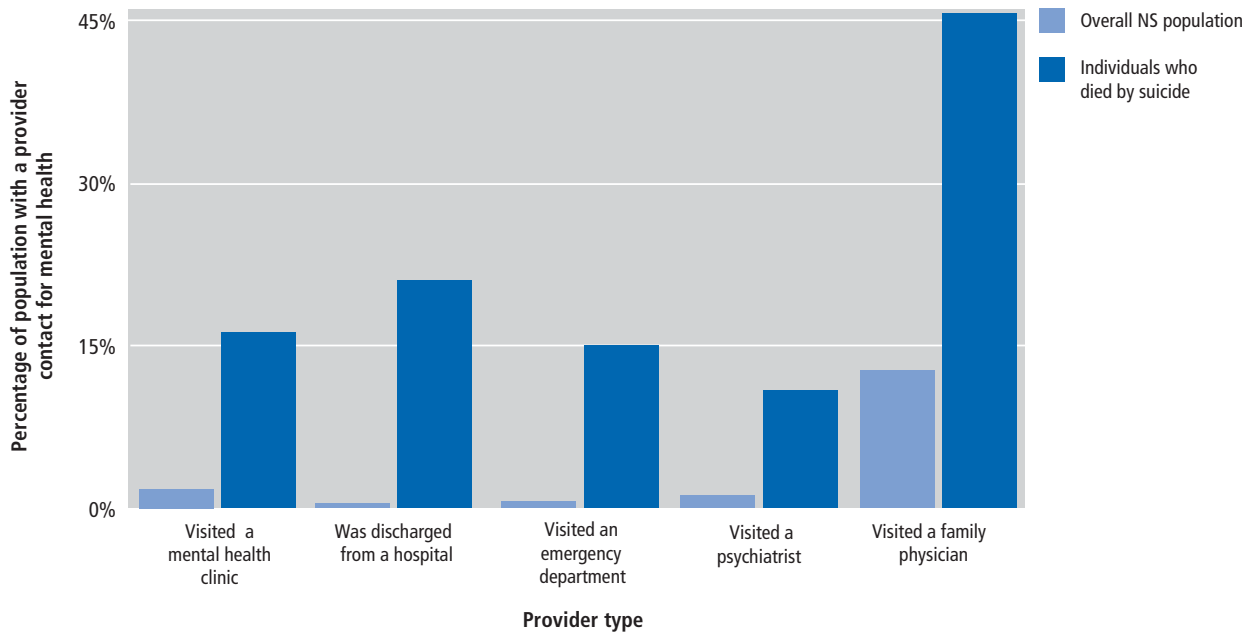
FACT

Twenty-seven per cent of the suicide population had a last mental disorder contact with health providers within one month preceding their death, and 55% had a mental disorder contact within one calendar year preceding death.

Likelihood of Being in Contact with a Health Provider

Between the years 1995 and 2004, individuals who completed suicide were more likely than the overall Nova Scotia population to be treated by health-care services (provincial mental health clinics, emergency rooms, psychiatrists, family physicians, or hospitals) for a mental disorder (Figure 30).¹⁶

Figure 30: Percentage of people with one or more mental disorder contacts in one year by provider type and health status (1995–2004)



FACTS

Of the individuals who completed suicide between the years 1995 and 2004

- Forty-five per cent visited a family physician for a mental disorder one or more times one year prior to their death.
- Eleven per cent visited a psychiatrist for a mental disorder one or more times one year prior to their death.
- Fifteen per cent visited an emergency ward for a mental disorder one or more times one year prior to their death.
- Sixteen per cent visited a mental health clinic for a mental disorder one or more times one year prior to their death.
- Twenty-one per cent were discharged from the hospital for a mental disorder one or more times one year prior to their death.

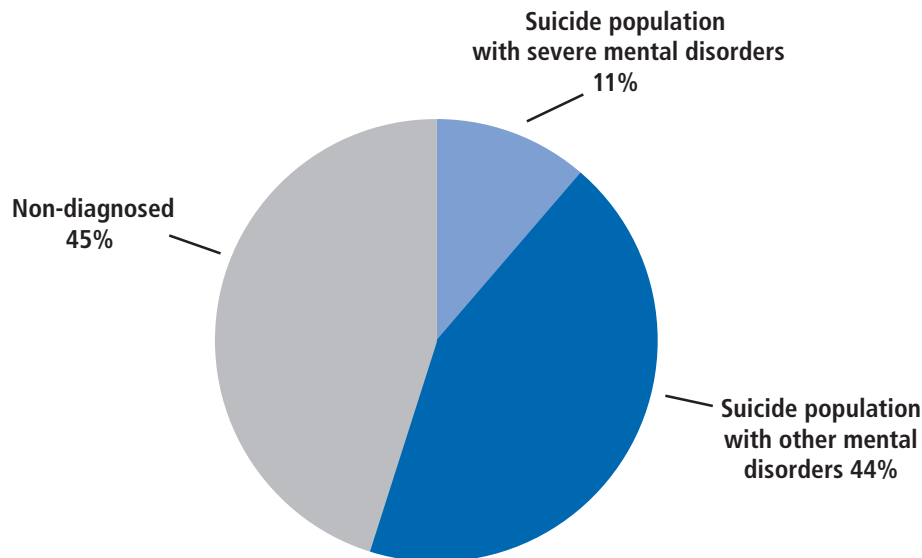
16. This analysis compares the percentage of the suicide population that had a mental health contact with a provider one year prior to death to the average percentage contact during years 1995–2004 of the rest of the Nova Scotia population in a fiscal year.

Severity of Mental Disorder and Suicide

Risk factors often cited to be associated with suicide include mental disorders, social isolation, substance abuse, traumatic life events, terminal illness, and a family history of suicide (Langlois and Morrison 2002). Suicide is not technically defined or coded administratively as a mental illness; however, people who are prepared to end their own lives often require treatment and assistance from families, communities, and the health system for their mental health problems. Provincially, the most commonly treated mental disorders were anxiety and depression. More-severe mental disorders, such as bipolar disorder and schizophrenia, generally occur in close to 1% of the population. Such individuals generally require more intensive and consistent levels of care (McAlpine and Mechanic 2000).

Although the diagnosed population with severe mental disorders made up close to 1% of the total Nova Scotia population in years 1995–2004, they made up approximately 11% of individuals who completed suicide (**Figure 31**). Forty-four per cent of the suicide population had a history of other mental disorders, and the remainder had no prior treatment for a mental disorder. As can be observed, there was a greater proportion (45%) of completed suicides without a prior mental health contact than attempted suicides without a prior mental health contact (Figure 11, 23% as shown on p. 22).

Figure 31: Proportion of completed suicides by severity of mental disorder (1995–2004)

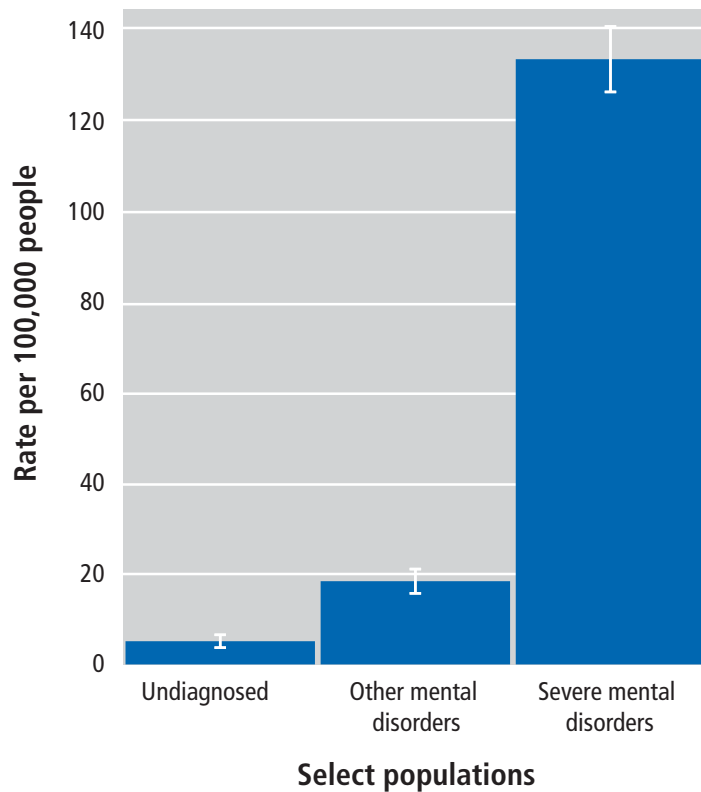


FACTS

- Forty-five per cent of completed suicides did not have a diagnosis for a mental disorder.
- Eleven per cent of completed suicides had a previous diagnosis of severe mental disorder(s).
- Forty-four per cent of completed suicides had a previous diagnosis of other mental disorder(s).

As can be observed from **Figure 32**, the rates of completed suicide amongst those with severe mental disorders were close to 133 per 100,000 people. This was roughly 7 times the rate of those with other mental disorders and 25 times the rate for Nova Scotians without any known mental disorders.

Figure 32: Rates of completed suicide (with 95% confidence intervals) by populations diagnosed with mental disorders—annual age-adjusted rates (1995–2004)



FACT

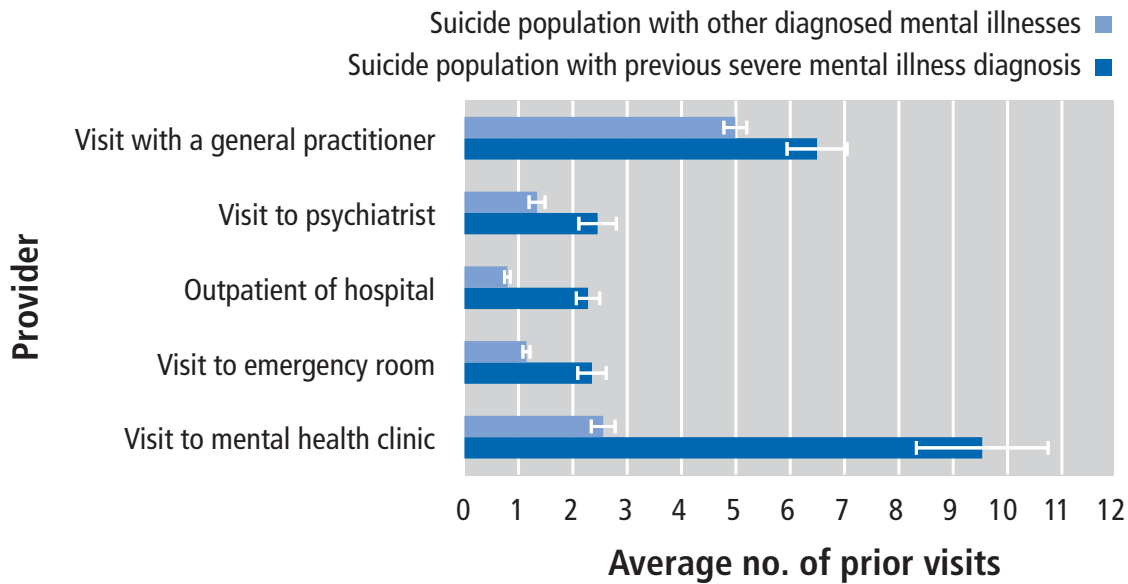
It has been observed that sustained treatment of persons with severe mental illness can reduce risks for hospitalization. (McAlpine and Mechanic 2000)

Generally, there are different utilization patterns for mental health services depending upon the severity of mental disorders (McAlpine and Mechanic 2000, 277–92). As can be observed from **Figure 33**, the total population with severe mental disorders who attempted or completed suicide (781 individuals made 1,072 attempts) averaged more than seven visits with a family physician in the year prior to their suicide episode, compared to under five visits for the total population who attempted or completed suicide with other mental disorders (3,497 individuals made 4,366 attempts).¹⁷ Those persons with severe mental disorders who attempted or completed suicide averaged over twice as many visits to psychiatrists as those with less severe mental disorders who attempted or completed suicide.

As has been observed in other research, those with severe mental disorders were much more likely to repeatedly use inpatient, emergency room, and outpatient services (McAlpine and Mechanic 2000, 284). Persons with severe mental disorders who attempted or completed suicide had more than double the number of emergency room visits and discharges from the hospital and close to four times the number of visits to mental health clinics as those with other mental disorders who attempted or completed suicide (p values ≤ 0.05).

17. Average number of contacts is the mean number of contacts individuals who have attempted suicide (subtracted by those who died in hospital) and those who completed suicide during years 1995–2004.

Figure 33: Average number of annual contacts (with 95% confidence intervals) for individuals one year prior to a suicidal act (1995–2004)



FACTS

- According to the World Health Organization, internationally “[m]ental disorders (particularly depression and substance abuse) are associated with more than 90% of all cases of suicide; however, suicide results from many complex socio-cultural factors and is more likely to occur particularly during periods of socioeconomic, family and individual crisis situations (e.g., loss of a loved one, employment.” (World Health Organization 2008a)
- Depression is the most frequent psychiatric disorder in the elderly. It is the reason for most suicides in this age group. (Stoppe et al. 1999, 193–98)
- Approximately 10% of patients with schizophrenia die by suicide, 18% to 55% attempt suicide at some point in their lives. (Radomsky et al. 1999, 1590)

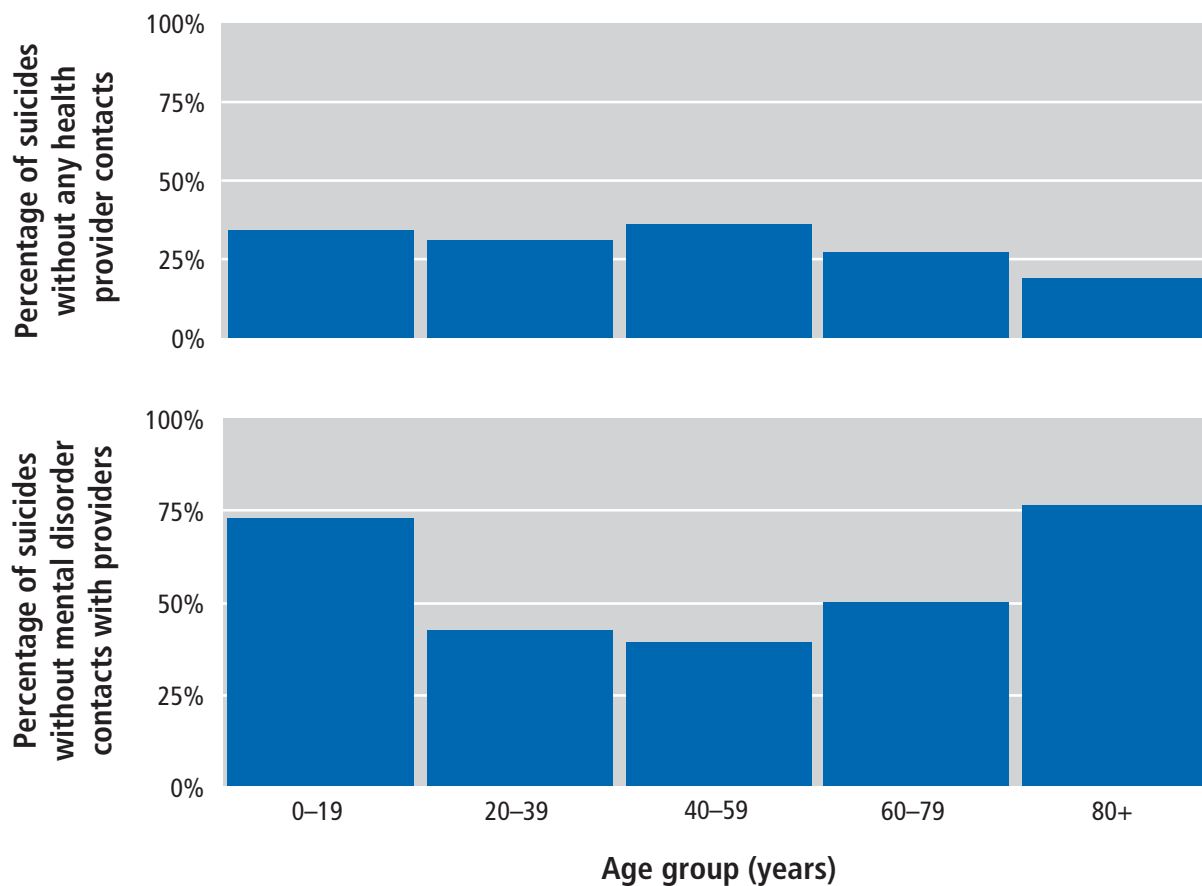
Completed Suicides without Any Health System Contacts

Some estimates indicate that 90% of people who complete suicide suffer from mental illness or a substance abuse disorder that could be diagnosed (Conwell 1995). It cannot be over-emphasized how challenging it is to identify individuals with suicidal intent before an attempt occurs. The World Health Organization estimates that, internationally, one in four patients visiting a health service has at least one mental, neurological, or behavioural disorder, but most of these disorders are undiagnosed and untreated (World Health Organization 2008).

As discussed previously, 45% of individuals who completed suicide had no contact for a mental disorder with health system providers prior to their suicide death (Figure 31). The age distribution, on the bottom chart of **Figure 34**, demonstrates that youth (ages 0–19) and individuals over the age of 80 had the least contact with the health-care system for a mental disorder. The top graph demonstrates that there was no pattern amongst age groups for treatment of any kind from the health system. What Figure 34 demonstrates is that while there was no discernable pattern for overall health system usage by all groups prior to a completed suicide, youth and those aged 80 and over were not seeing or being diagnosed specifically for mental disorders by health providers. Mental disorders often co-occur with other serious illnesses such as chronic diseases. As many older adults face these illnesses more frequently

than younger populations, mental disorders may go undetected or untreated as the focus of families, health professionals, and the patients themselves is with treating other ailments (Public Health Agency of Canada 2006). There is also evidence that primary care practitioners may be less aware of diagnoses and procedures for children with mental disorders than they are for adults (Kutcher and Davidson 2007).

Figure 34: Percentage of suicide deaths without health system contacts one year prior to death (1995–2004)



Summary of Facts

Hospitalization for Suicide Attempts

- Suicide was the second largest category for injury-related hospitalizations across Nova Scotia (excluding medical complications and adverse events).
- The data indicate that the rate of hospitalizations for attempted suicide declined from 77 individuals per 100,000 people in 1995 to 54 individuals per 100,000 people in 2004.
- Fifty-five per cent of hospitalizations for suicide attempts were by females. The sex disparity was more apparent among younger age groups and declined with age.
- Poisonings were by far the most frequent method of suicide attempts resulting in hospitalization in Nova Scotia from 1995 to 2004. Females constituted 59% of hospitalizations due to self-poisoning. Males were more likely than females to be hospitalized for all other means of attempted suicide.
- Non-narcotic pain, fever, or anti-inflammatory pills were numerically used most frequently by teenagers and young adults in self-poisonings; whereas older individuals more frequently made use of anti-convulsion, sleep, depression, and/or anxiety medications to attempt suicide.
- Females between the ages of 15 and 19 had the highest hospitalization rate for attempted suicide of any age category.
- There were higher rates of hospitalization for attempted suicide in lower income quartiles than in higher income quartiles.
- It is estimated that 93% of known suicide attempts occurred within the home before being hospitalized.
- In 84% of suicide attempts with a prior history of substance abuse there was also a history of treatment for mental disorders.
- Individuals who had a history of concurrent disorders and who attempted suicide were four times more likely to be hospitalized multiple times for a suicide attempt than individuals with only one type of disorder who attempted suicide.
- Within one year prior to a hospitalization for attempted suicide, 87% of individuals had a prior health service contact for a mental disorder, with either a family practitioner, psychiatrist, emergency room, hospital, or mental health clinic.
- There were fewer visits to emergency room services and psychiatric services for a mental disorder, one year prior to the attempt, for rural individuals than in cases where the individual had an urban residence.
- There were a greater number of visits, one year prior to the attempt, to mental health clinics, emergency rooms, and general practitioners by individuals in lower income quartiles, than by individuals in higher income quartiles.
- Hospitalizations for suicide attempts by individuals without previous mental disorder diagnoses were statistically more common among males and rural residents.
- In all of the hospitalizations for a suicide attempt in years 1995–2004 by individuals 60 and older, 23% had a previous hospitalization for “another reason”—other than for mental health compared to 7% for those under age 60.

Completed Suicides

- In 2001, Nova Scotia's suicide rate was lower than the national average; it was not significantly different from Ontario, Prince Edward Island, British Columbia, Saskatchewan, or Manitoba.
- Nova Scotia's suicide rate declined over the 1995–2004 period. This decline was not considered to be statistically significant.
- Numerically, 84% of completed suicides were by males.
- Males between the ages of 50 and 54 had the highest rate of completed suicide.
- Use of firearms was the most frequent means of suicide death in Nova Scotia. Hanging, strangulation, or suffocation was the second most common means of completing suicide. Younger people tended to use hanging, strangulation, and suffocation more frequently, while seniors more frequently used firearms.
- There was no noticeable difference in frequency of suicide death for urban or rural Nova Scotians.
- Twenty-seven per cent of those who completed suicide had a final mental disorder contact with the health system one month prior to their death. Fifty-five per cent of those who completed suicide had a final mental disorder contact within one calendar year prior to their death.
- Individuals who completed suicide had a greater degree of contact with all health service providers for mental disorders.
- Nova Scotians with severe mental disorders had higher rates of suicide, at about 133 people per 100,000, compared to Nova Scotians with less severe mental disorders. Nova Scotians with other mental disorders, but not schizophrenia or bipolar disorder, had higher rates of suicide, at 18 per 100,000, compared to Nova Scotians without any diagnosed mental disorder. Nova Scotians without mental disorder diagnoses or treatment had a suicide rate of 5 persons per 100,000.
- Those with severe levels of mental disorder who attempted or completed suicide utilized provider services with greater frequency than those who were diagnosed with less severe mental disorders prior to their suicide death or hospitalization.
- Those who completed a suicide without having a mental health diagnosis were more frequently males, youths, or seniors.

Appendix 1: Suicide ICD 9 & 10 Definition Codes

Suicide By Cause	ICD-10 codes	ICD-9 codes
Poisoning		
• exposure to anti-inflammatories, pain relievers, and arthritis drugs	X60	950.0
• exposure to antiepileptic, sedative-hypnotic, antiparkinsonism, and psychotropic drugs	X61	950.1, 950.2, 950.3
• other and unspecified drugs, medicaments, and biological substances	X64	950.4, 950.5
• motor vehicle exhaust and other gases and vapours	X 66, X67	952.0
• other	X62, X63, X65, X68, X69	950.7
Hanging, strangulation, and suffocation	X70	953.0, 953.1
Drowning and submersion	X71	954
Firearms		
• intentional self-harm by handgun discharge	X72	955.00, 955.07, 955.06, 955.04, 955.05, 955.02, 955.03, 955.01, 955.08, 955.09
• self-harm by rifle, shotgun, and larger firearm discharge	X73	955.1, 955.2
• other and unspecified firearm discharge	X74	955.4
Cutting and/or piercing with a sharp object	X78	956
Jumping from a high place	X80	957.0, 957.1, 957.9
Jumping or lying before moving object	X81	958.0
Other		
• crashing of motor vehicle	X82	958.5
• other specified means	X83	958.8
• intentional self-harm by explosive material	X75	955.50, 955.90, 955.57, 955.97, 955.56, 955.96, 955.94, 955.54, 955.55, 955.95, 955.92, 955.93, 955.52, 955.53, 955.51, 955.91, 955.58, 955.98, 955.99, 955.59
• intentional self-harm by blunt object	X79	
• steam, hot vapours, and hot objects	X77	958.20, 958.27, 958.26, 958.24, 958.25, 958.22, 958.23, 958.21, 958.28, 958.29
• self-harm by unspecified means	X84	958.9
• smoke, fire, and flames	X76	958.1

Appendix 2: Mental Health Chapter Codes

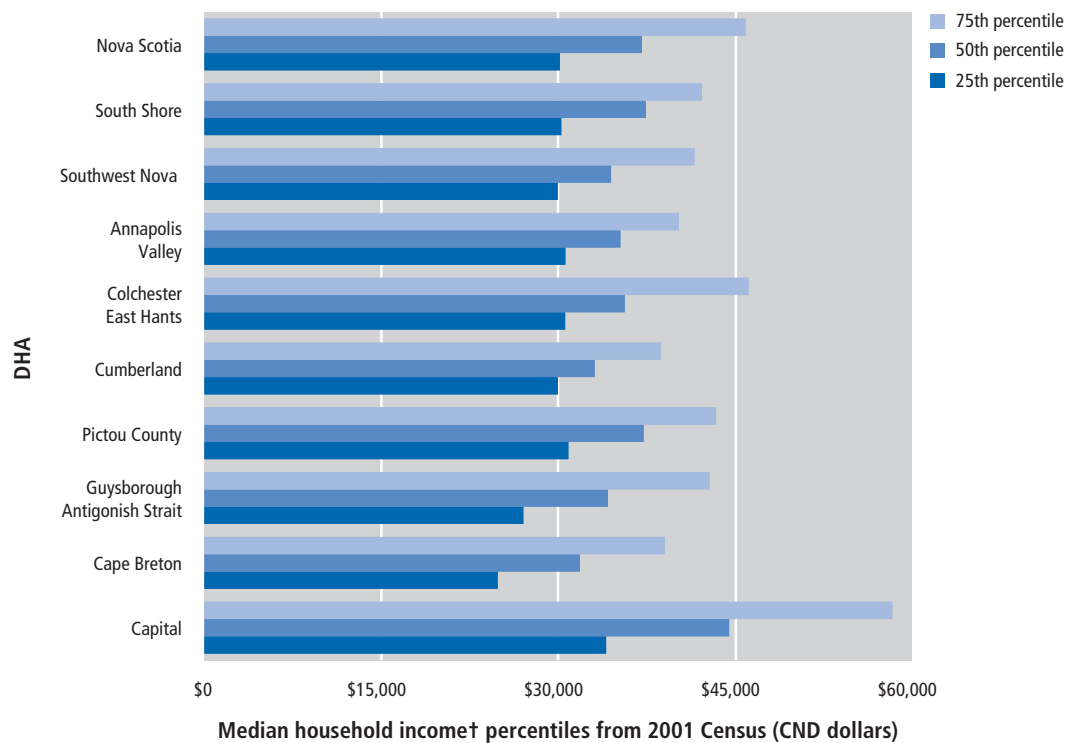
	ICD-9-CM: 290-316	ICD-10-CA: F00- F69, F90-F99
Organic/Dementia	ICD-9-CM: 290, 293, 294, 310	ICD-10-CA: F00-F09
Substance Abuse	ICD-9-CM: 291, 292, 303-305	ICD-10-CA: F10-F19
Schizophrenic Disorder	ICD-9-CM: 295, 297, 298	ICD-10-CA: F20-F29
Depression	ICD-9-CM: 296.2, 296.3, 300.4, 311	ICD-10-CA: F32, F33, F34.1
Bipolar Disorder	ICD-9-CM: 296.0, 296.1, 296.4-296.8	ICD-10-CA: F30, F31
Anxiety	ICD-9-CM: 300.0, 300.2, 300.3, 308, 309	ICD-10-CA: F40- F43
Other Neurotic Disorder	ICD-9-CM: 300.1, 300.5-300.9, 306, 307.8, 316	ICD-10-CA: F44, F45, F48
Conduct Disorder	ICD-9-CM: 312, 314	ICD-10-CA: F90-F92
Other Mood Disorders	ICD-9-CM: 301.1, 296.99, 296.90	ICD-10-CA: F34.0, F34.8, F34.9, F38, F39
Other	ICD-9-CM: 301.2-301.9, 302, 307.0-307.7, 307.9, 313	ICD-10-CA: F50-F69, F93-F95, F98, F99

Appendix 3: Average Annual Income by Quartile

Median household income, obtained from the 2001 Canadian Census, varied across DHA (Table 4). The highest incomes were observed in Capital District Health Authority, where median household incomes in the 50th percentile were higher than those in the 75th percentile for all other districts except Colchester East Hants (Figure 35).

District health authority	1st quartile	2nd quartile	3rd quartile	4th quartile
Annapolis Valley	\$0–\$30,599	\$30,600–\$35,266	\$35,267–\$40,226	≥ \$40,227
Cape Breton	\$0–\$24,859	\$24,860–\$31,832	\$31,833–\$39,024	≥ \$39,025
Capital	\$0–\$34,053	\$34,054–\$44,482	\$44,483–\$58,328	≥ \$58,329
Colchester East Hants	\$0–\$30,582	\$30,583–\$35,631	\$35,632–\$46,139	≥ \$46,140
Cumberland	\$0–\$29,969	\$29,970–\$33,080	\$33,081–\$38,701	≥ \$38,702
Guysborough Antigonish Strait	\$0–\$27,033	\$27,034–\$34,204	\$34,205–\$42,842	≥ \$42,843
Pictou County	\$0–\$30,851	\$30,852–\$37,235	\$37,236–\$43,377	≥ \$43,378
South Shore	\$0–\$30,253	\$30,254–\$37,437	\$37,438–\$42,171	≥ \$42,172
Southwest Nova	\$0–\$29,949	\$29,950–\$34,473	\$34,474–\$41,543	≥ \$41,544
Nova Scotia	\$0–\$30,127	\$30,128–\$37,088	\$37,089–\$45,891	≥ \$45,892

Figure 35. Average household income percentiles from 2001 Census by DHA¹⁸



18. Median household income for neighbourhood was assigned to records at the level of dissemination area.

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