Niagara Region Public Health

A Summary of Self-harm and Suicide in Niagara

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Niagara Region

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This report was written to inform the work done by the Niagara Suicide Prevention Coalition.

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1 Introduction

1.1 Background

In 2010, Niagara Region Public Health published a Report on Preventable Injuries in Niagara to better understand what types of injuries were causing the greatest burden to residents, as well as the health care system (1). From this report, self-harm was identified as the most common cause of injury-related death in Niagara (more than 25% of all injury-related deaths), as well as contributed to the most potential years of life lost due to injury (more than 30% of all potential years of life lost due to injury).

A follow-up to this report was published in 2017 (2). This report provided more recent data for each of the 12 categories of injuries (one of which is self-harm/suicide). This report identified that Niagara had higher rates of self-harm related injuries presenting to EDs compared to the province. In addition, females had significantly higher rates of ED visits and hospital admissions when compared to males, and youth aged 15 to 24 had the highest rates of ED visits related to self-harm.

1.2 Purpose

The purpose of this report is to provide updated data for self-harm and suicide in Niagara, by analyzing Emergency Medical Service (EMS), Emergency Department (ED) visit, hospital admission, and death data for Niagara residents. This report also includes data on methods of self-harm and suicide. By analyzing the data by age and sex, priority populations can be identified.

2 Methods

2.1 Data Sources

Data sources for this report include:

- EMS Edge
- Vital Statistics
- National Ambulatory Care Reporting System (NACRS)
- Population Estimates

For all diagnosis data (NACRS and Vital Statistics), the External Cause Diagnostic Codes from the International Statistical Classification of Diseases and Related Health Problems 10th Revision Canadian version (ICD-10-CA) were used.

For NACRS and Vital Statistics data, Niagara region residency is determined by the primary postal code associated with the patient. Care received in Ontario but outside Niagara are captured in this report.

For EMS Edge data, incidents captured in this report would include any calls to EMS that originate in Niagara, regardless of whether or not the person involved lived in Niagara.

Data Source Limitations

Data presented here captures all data from ED visits; however, many self-harm injuries do not present to EDs. Some present to other physician offices or other health care providers, while others do not receive any professional care for their injuries. With this in mind, data from NACRS will underestimate the number of injuries related to self-harm.

In addition, data presented from EMS Edge represents information made available at the time of the call to 9-1-1. Some 9-1-1 calls that are originally classified as related to self-harm/suicide may not in fact be related to self-harm/suicide after assessment has occurred by the paramedic. In addition, some calls may originally be classified as not related to self-harm/suicide, may be coded as such after assessment has occurred by the paramedic. As a result, underestimation or overestimation of the true burden of self-harm/suicide calls on EMS may occur.

2.2 Reporting

Some tables include the annotation NR for Not Reportable. Results based on cell counts of less than 5 visits, admissions or deaths are not reported on to ensure individuals are not identifiable. Null values (results based on cell counts of zero) have been reported.

3 Findings

Self-harm injuries are classified in the ICD-10 codes under X60-X84 and Y87.0. These include self-harm injuries from a variety of drugs, poisons, and firearm use (see Appendix A for more information). Self-harm injuries resulting in death are more commonly referred to as suicides.

Of the 12 external causes of morbidity and mortality categories, self-harm injuries ranks tenth in ED visits and second in hospital admissions, with 814 ED visits and 444 hospital admissions in 2016. Of the ED visits for self-harm, 54.5% of these resulted in hospitalization. Self-harm injuries were the second leading external cause of mortality in 2015 (Tables 1 and 2). Please refer to Table 3 for a summary of the most recent data related to self-harm.

Over the past 10 years, EMS calls related to self-harm have increased. In 2018, there were 938 calls to EMS that were classified as being related to suicide attempts or self-harm in addition to the 1,644 calls that were classified as being related to suicidal thoughts. From 2006-2009, there were more EMS calls that were classified as being related to suicide attempts or self-harm than there were related to suicidal thoughts/contemplating suicide; however, since 2010, the opposite has been true. From 2006-2018, the number of calls classified as being related to suicidal thoughts has quadrupled. This may in part be due to changes in EMS dispatch protocols (Figure 1).

Between 2009 and 2016, ED visits due to self-harm have significantly increased (Figure 2). Almost two-thirds of all ED visits due to self-harm occurred in females (Figure 3). Across the lifespan, youth (15 to 24 years) have the highest rate of ED visits for self-harm injuries (Figure 4). Of all the ED visits due to self-harm from 2013-2017, the majority (71.3%) were due to self-harm through drug use (Figure 5). Similar results were seen when looking at females and males separately (Figure 6 and 7).

Between 2009 and 2015, rates of self-harm injuries who were admitted to the hospital through the ED had significantly decreased. This was followed by a significant increase in 2016 that is similar to 2009 rates (Figure 8). Similar to ED visits, two-thirds of these hospitalizations occur in females (Figure 9). In addition, most of these occurred in those who were self-harming through drug use (Figures 10, 11 and 12).

In contrast to ED and hospitalization data, three-quarters of all suicides occur in males (Figure 13). Overall, the most common method of suicide is hanging, with 40.3% of all suicides from 2013-2015 using this method (Figure 14, 15 and 16).

Table 1: Ranking of ED, admissions and mortality data

Injury Category	ED Ranking (2016)	Admissions Ranking (2016)	Mortality Ranking (2015)
All Unintentional Injuries			
Burns	9	11	6
Cut/pierce	3	8	NR
Drowning/near-drowning	12	12	NR
Falls	1	1	1
Motor vehicle collision	5	3	4
Natural/environment	6	9	NR
Overexertion	4	10	-
Struck by or against	2	5	NR
Suffocation	11	6	6
Unintentional poisoning	8	4	3
All Intentional Injuries			
Assault	7	7	5
Self-harm	10	2	2

NR: Not Reportable (cell counts <5)
-: cell counts of 0
Data source: National Ambulatory Care Reporting System and Vital Statistics, 2019.

Table 2: Percentage of ED visits that resulted in hospitalization (2016)

Injury Category	# of ED visits	# admitted	% of ED visits being admitted
All Unintentional Injuries			
Burns	637	33	5.2
Cut/pierce	4,619	51	1.1
Drowning	27	6	22.2
Falls	18,400	2,290	12.4
Motor vehicle collision	3,257	315	9.7
Natural/environment	3,003	63	2.1
Overexertion	3,282	39	1.2
Struck by or against	8,161	130	1.6
Suffocation	172	130	75.6
Unintentional poisoning	1,016	176	17.3
All Intentional Injuries			
Assault	1,137	70	6.2
Self-harm	814	444	54.5

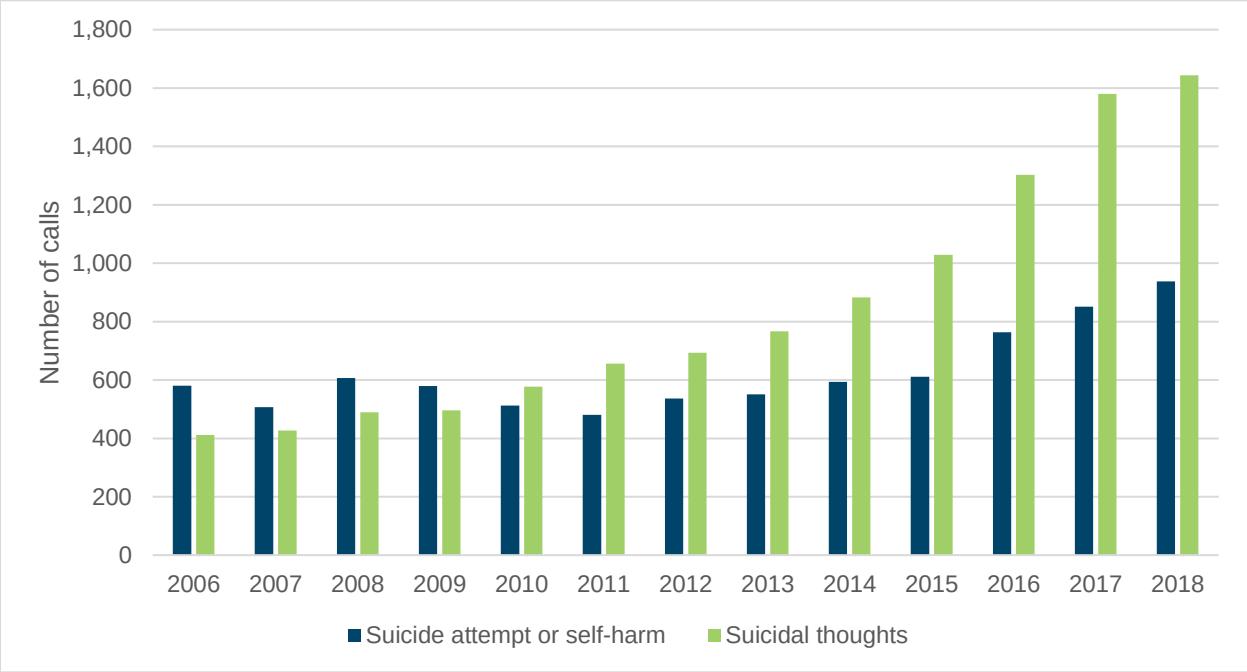
Data source: National Ambulatory Care Reporting System, 2018.

Table 3: Summary data for self-harm injuries

	ED visits (2016) per 100,000 population	Hospital admissions (2016) per 100,000 population	Mortality (2015) per 100,000 population
Niagara	238.7	124.4	7.1
Females	287.7	164.6	4.2
Males	191.3	84.9	10.0

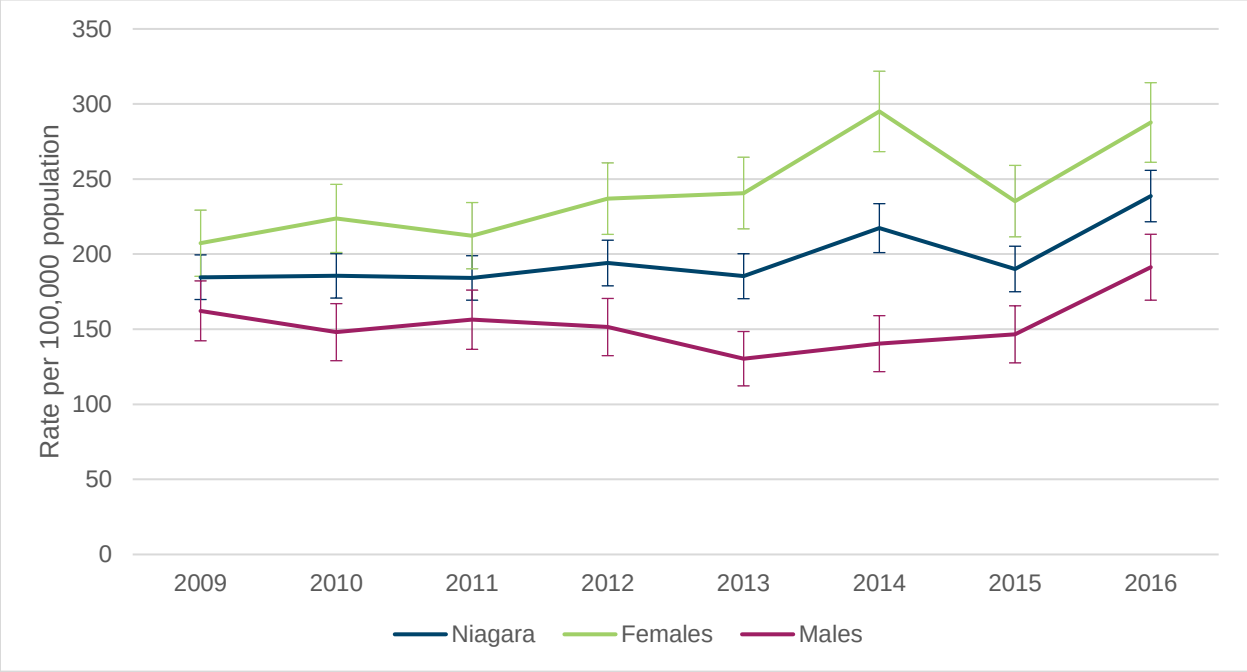
Data source: National Ambulatory Care Reporting System and Population Estimates, 2018; Vital Statistics, 2019.

Figure 1: Number of calls to EMS relating to suicide or self-harm (2006-2018)



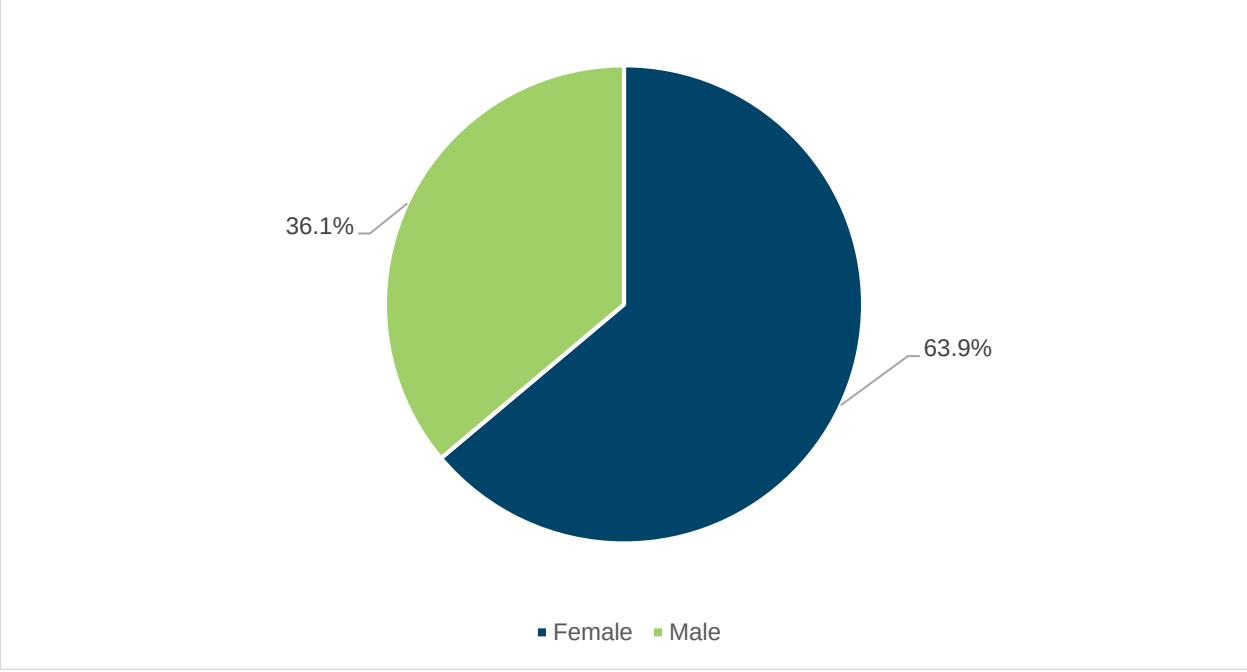
Data source: EMS Edge, 2019.
Note: In February 2017, dispatch protocols were updated. This may account for some of the increase in calls that were made in 2017.

Figure 2: Age-standardized rates of self-harm injuries who visited and ED, by sex (2009-2016)



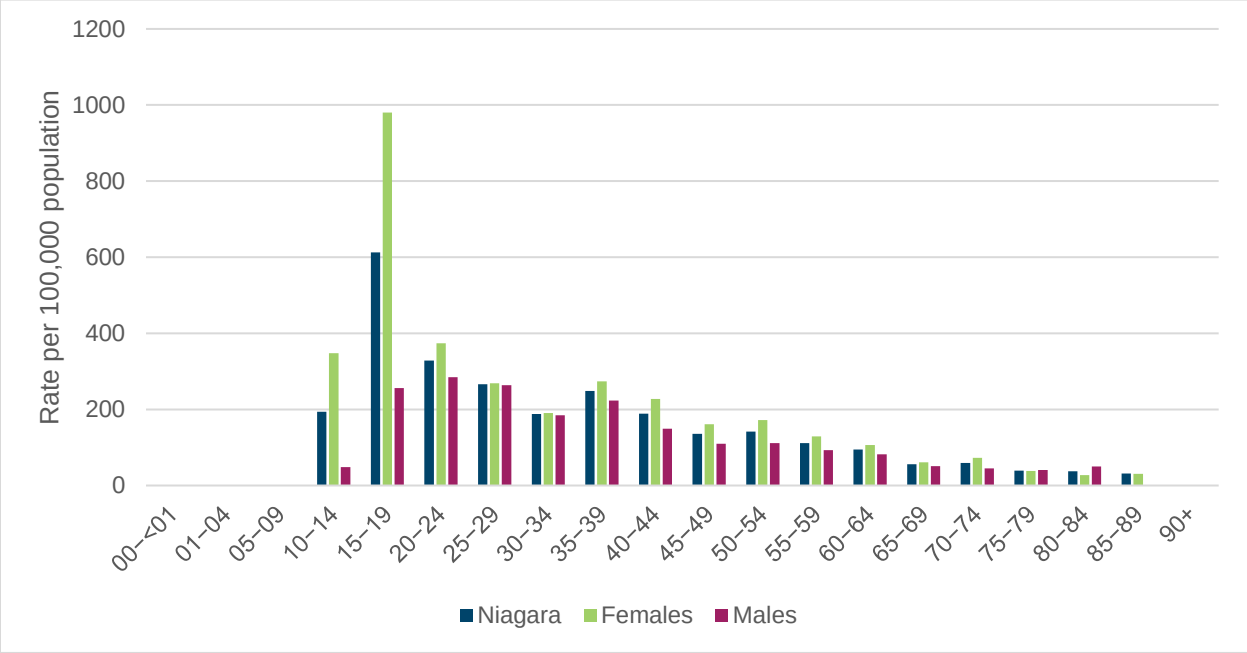
Data source: National Ambulatory Care Reporting System and Population Estimates, 2018.

Figure 3: Proportion of all self-harm ED visits that occur in males and females (2013-2017)



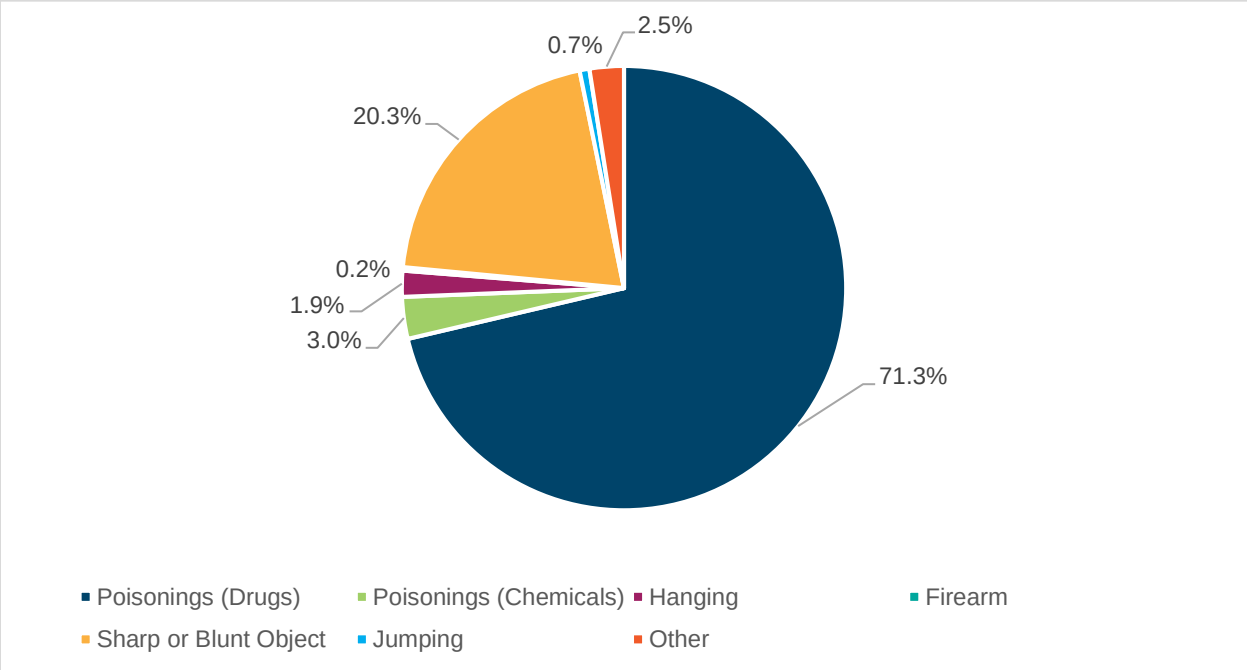
Data source: National Ambulatory Care Reporting System, 2018.

Figure 4: Age-specific rates of self-harm injuries who visited an ED, by age and sex (2014-2016)



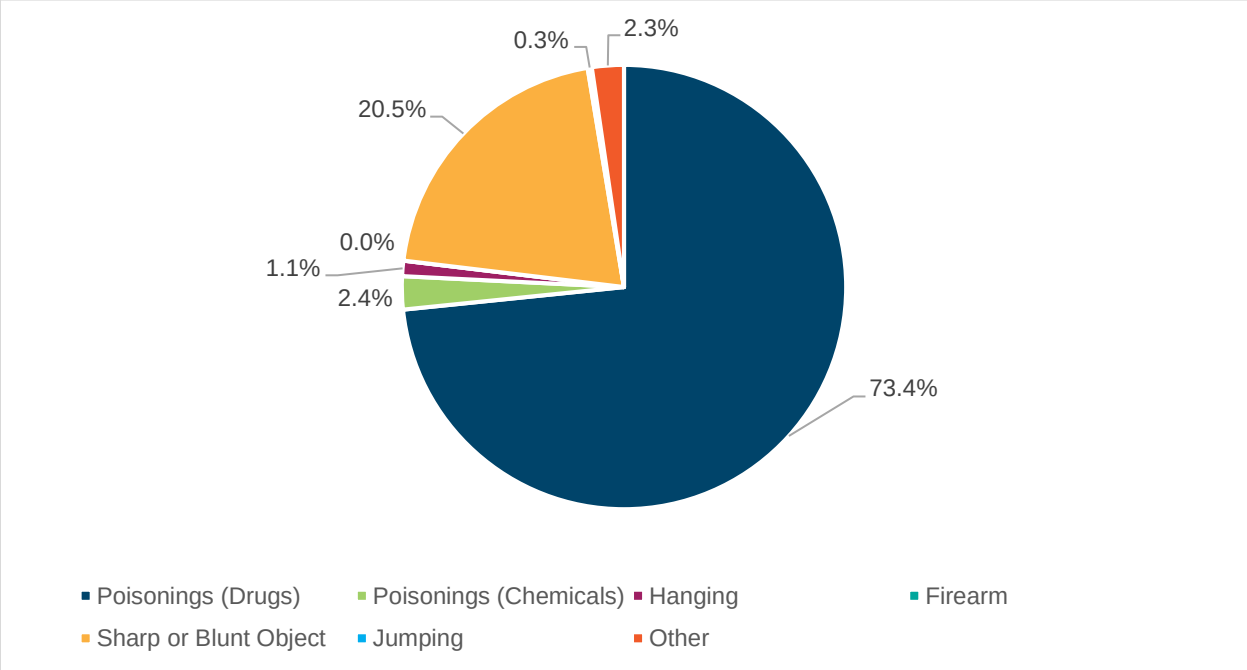
Data source: National Ambulatory Care Reporting System and Population Estimates, 2018.

Figure 5: ED visit diagnoses related to self-harm, by category (2013-2017) (N=3,648)



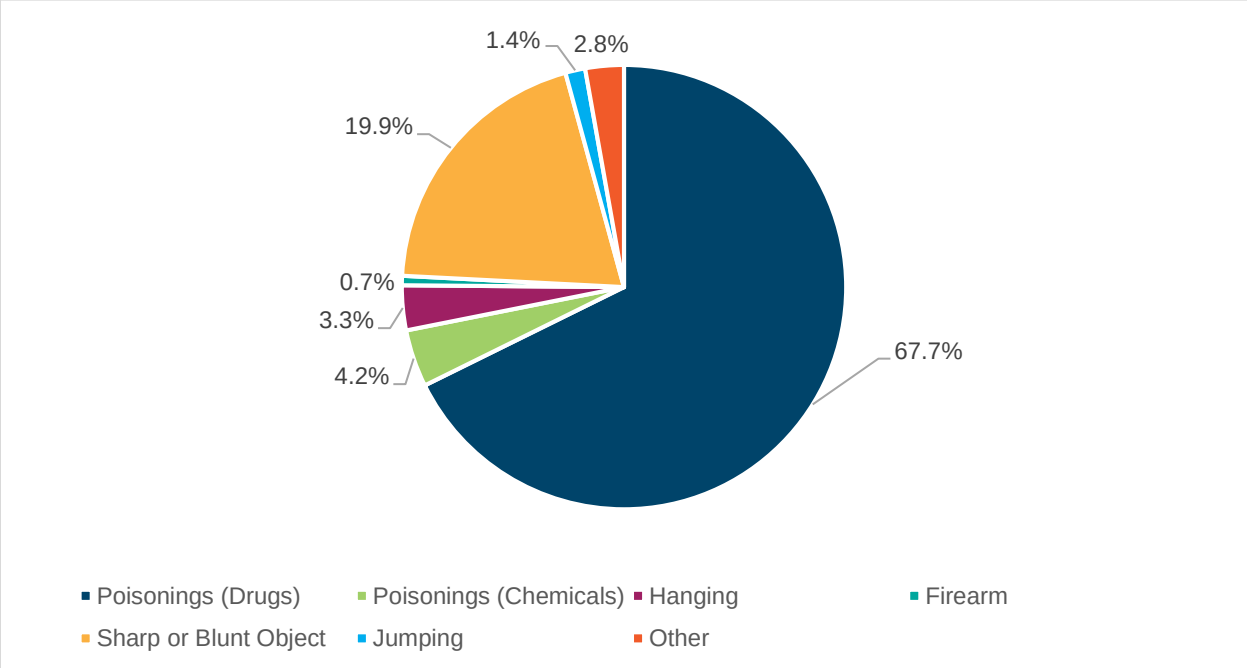
Data source: National Ambulatory Care Reporting System, 2018.

Figure 6: ED visit diagnoses related to self-harm by females, by category (2013-2017) (N=2,329)



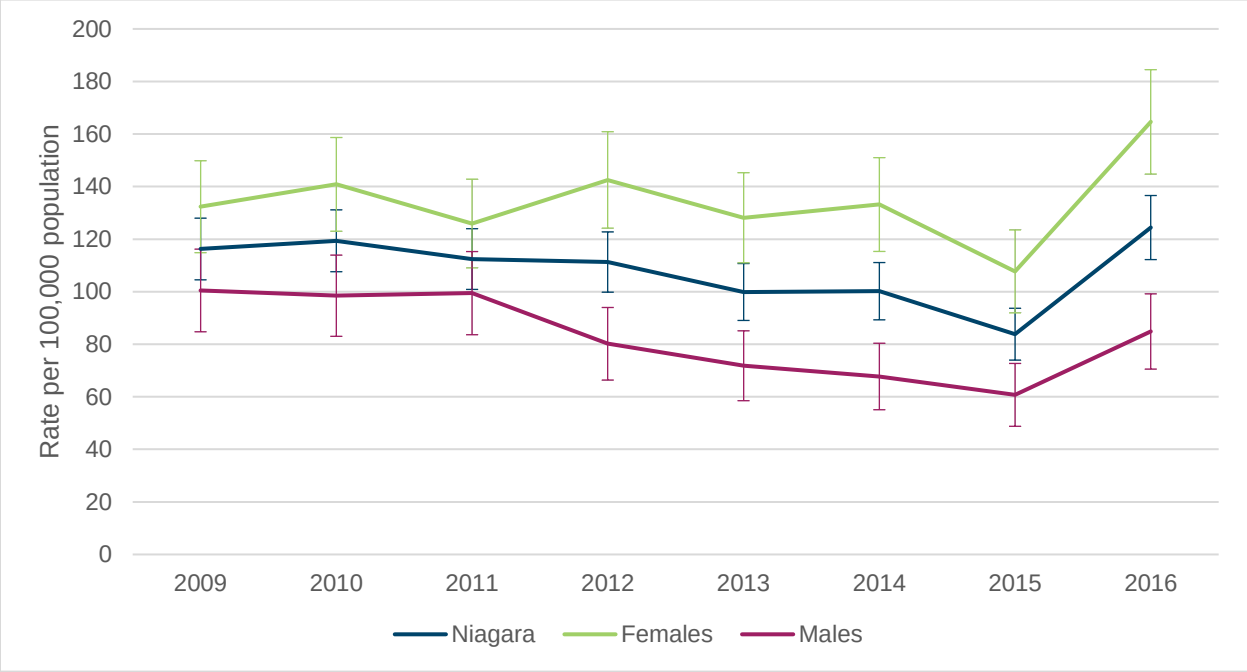
Data source: National Ambulatory Care Reporting System, 2018.

Figure 7: ED visit diagnoses related to self-harm by males, by category (2013-2017) (N=1,319)



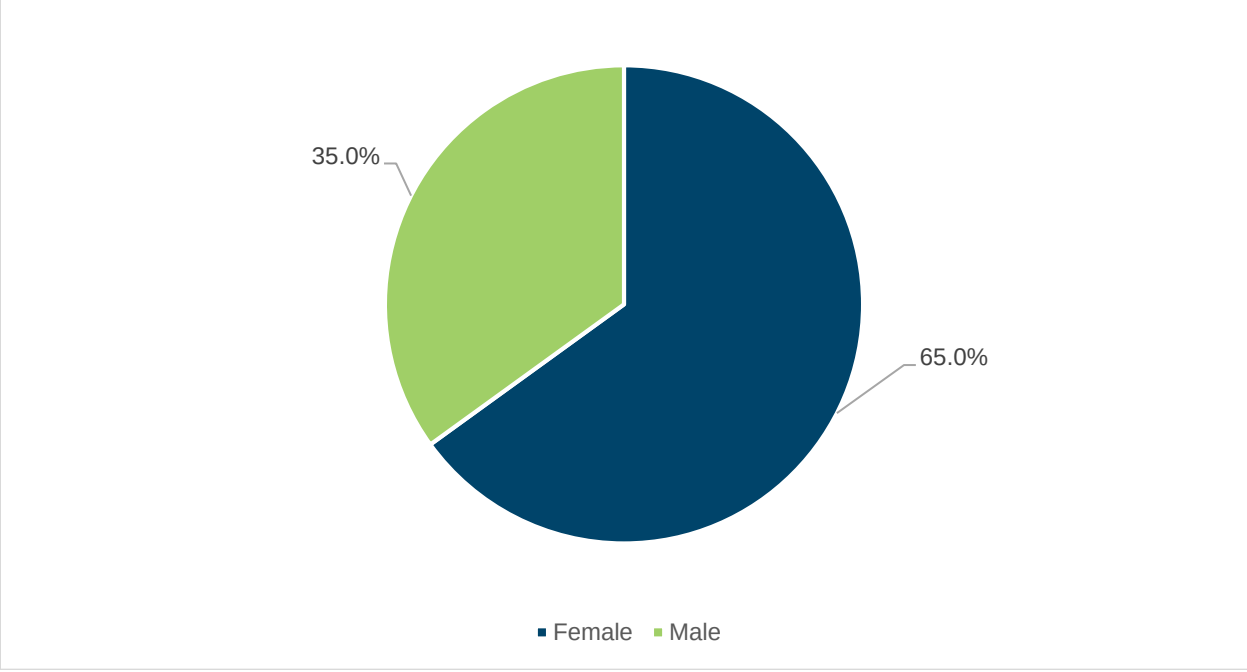
Data source: National Ambulatory Care Reporting System, 2018.

Figure 8: Age-standardized rates of self-harm injuries who were admitted to the hospital through an ED, by sex (2009-2016)



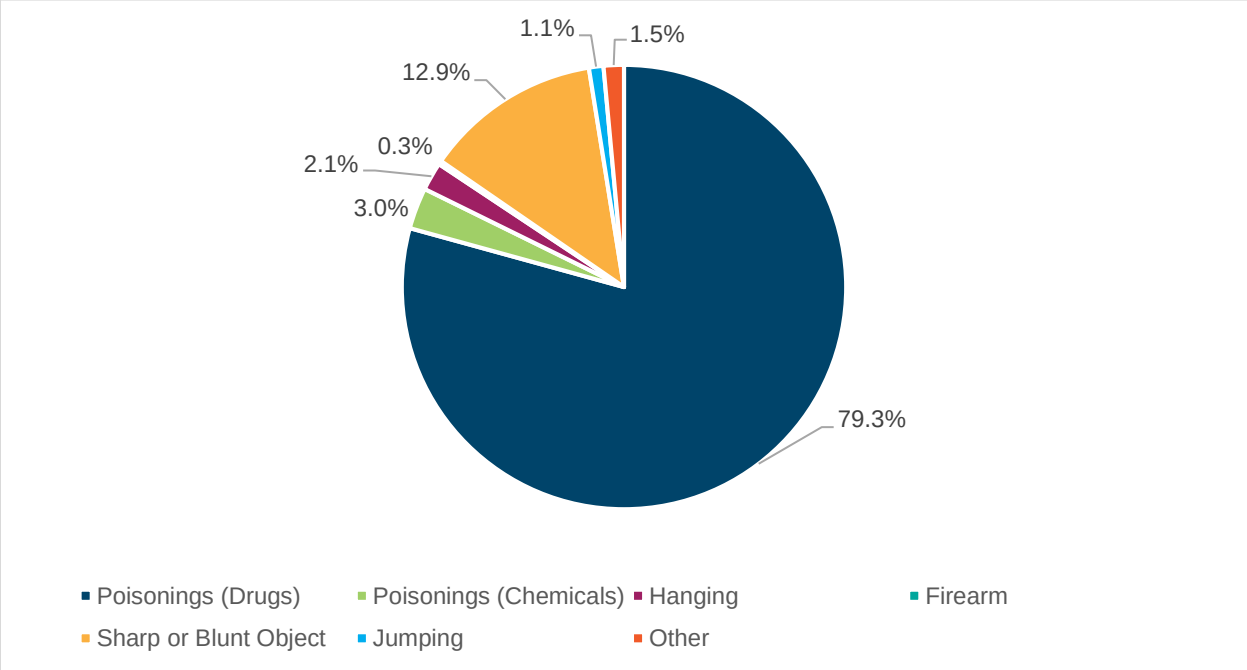
Data source: National Ambulatory Care Reporting System and Population Estimates, 2018.

Figure 9: Proportion of all self-harm injuries who were admitted to hospital through an ED that occur in males and females (2013-2017)



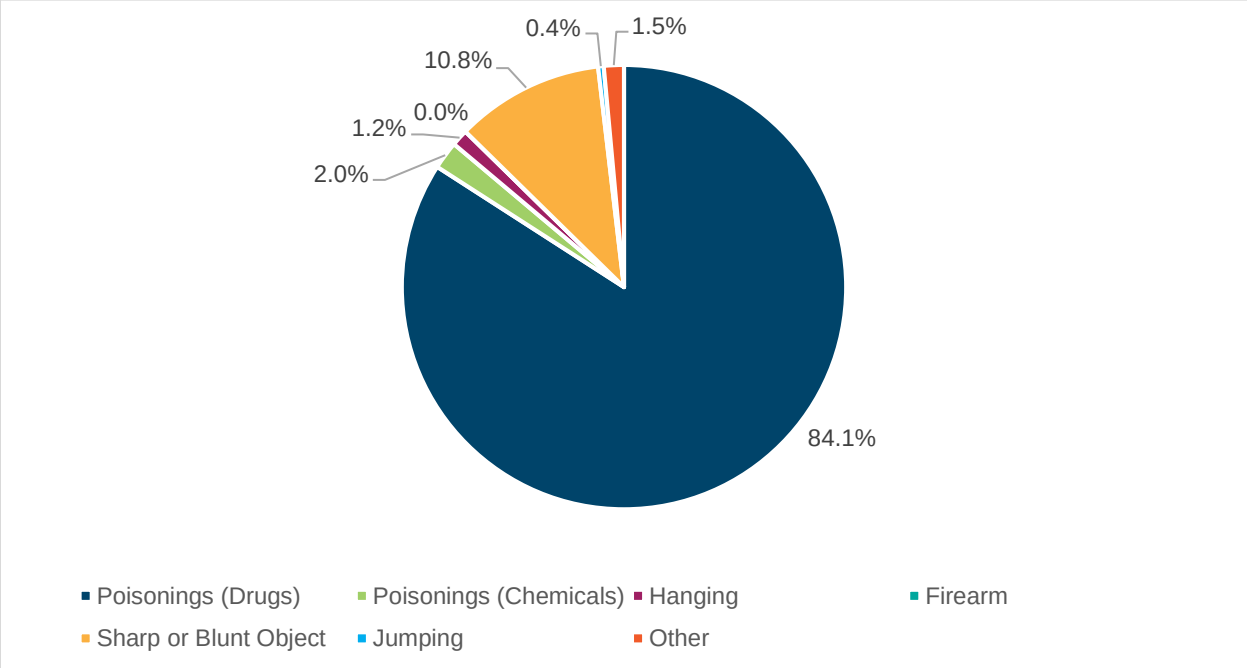
Data source: National Ambulatory Care Reporting System, 2018.

Figure 10: Hospital admission diagnoses related to self-harm, by category (2013-2017) (N=1,896)



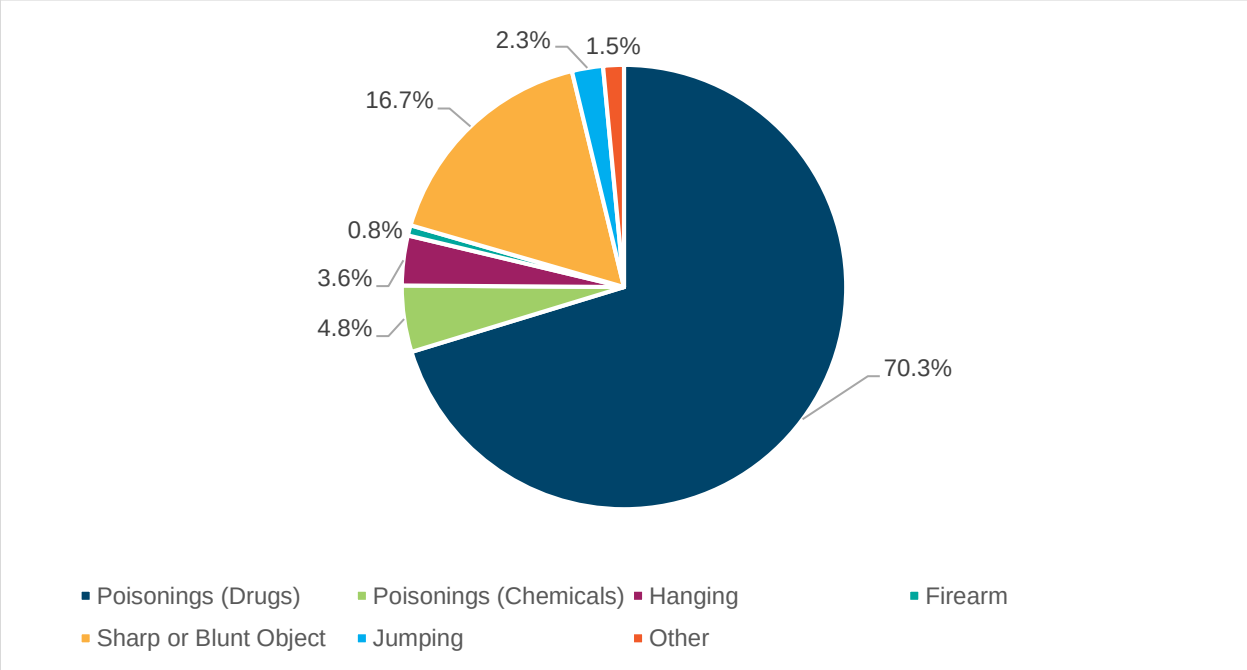
Data source: National Ambulatory Care Reporting System, 2018.

Figure 11: Hospital admission diagnoses related to self-harm by females, by category (2013-2017) (N=1,233)



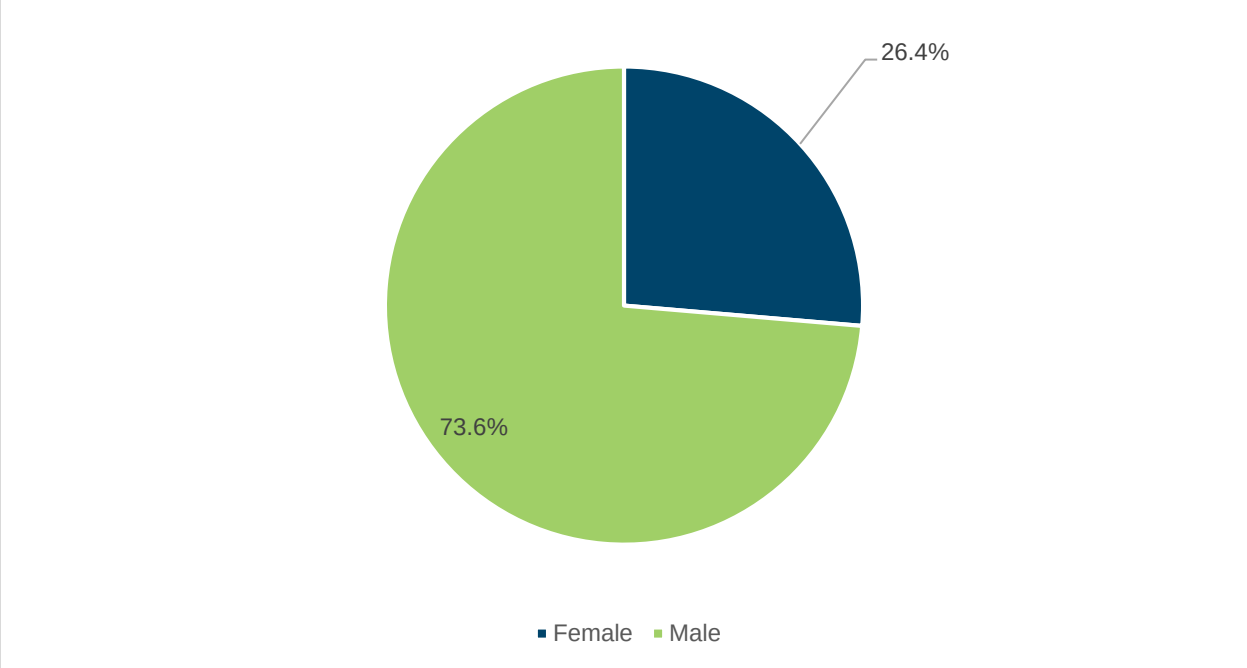
Data source: National Ambulatory Care Reporting System, 2018.

Figure 12: Hospital admission diagnoses related to self-harm by males, by category (2013-2017) (N=663)



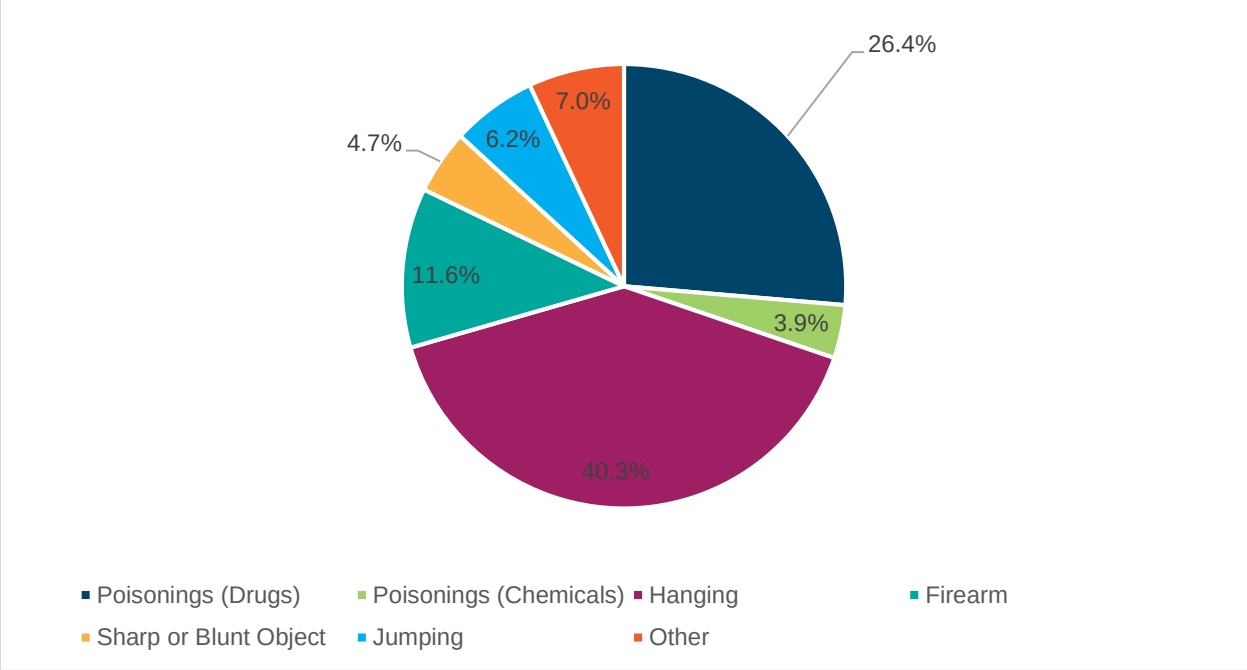
Data source: National Ambulatory Care Reporting System, 2018.

Figure 13: Proportion of suicides that occur in males and females (2013-2015)



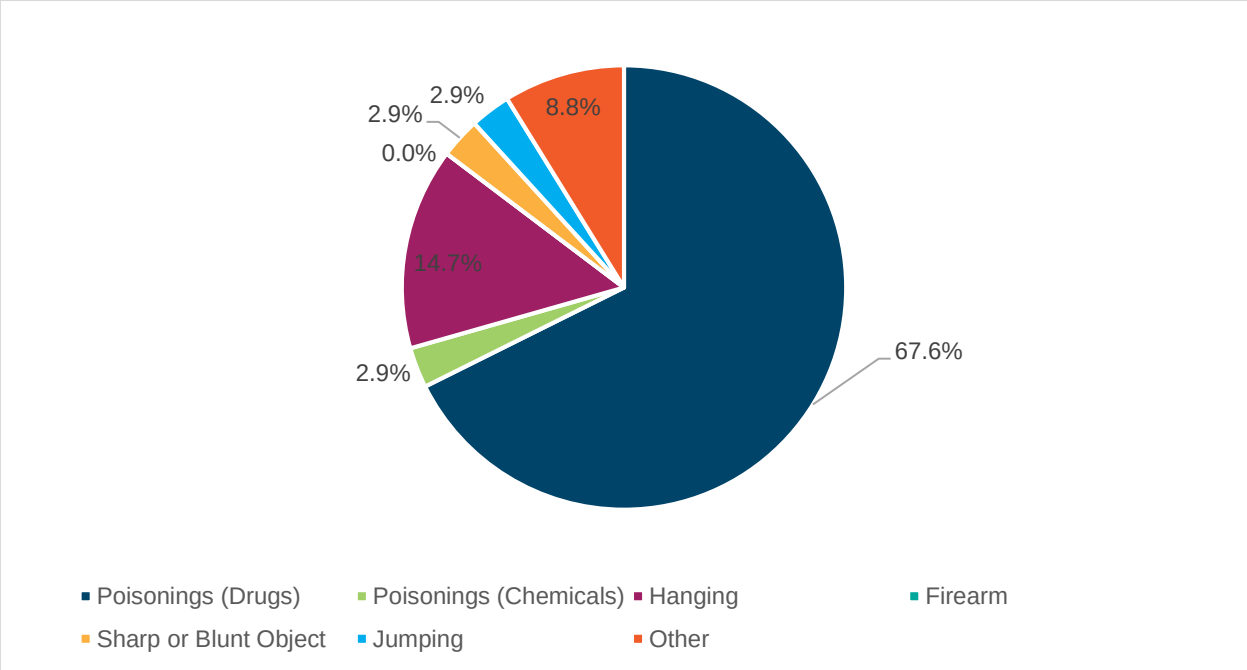
Data source: Vital Statistics, 2019.

Figure 14: Suicide deaths, by category (2013-2015) (N=129)



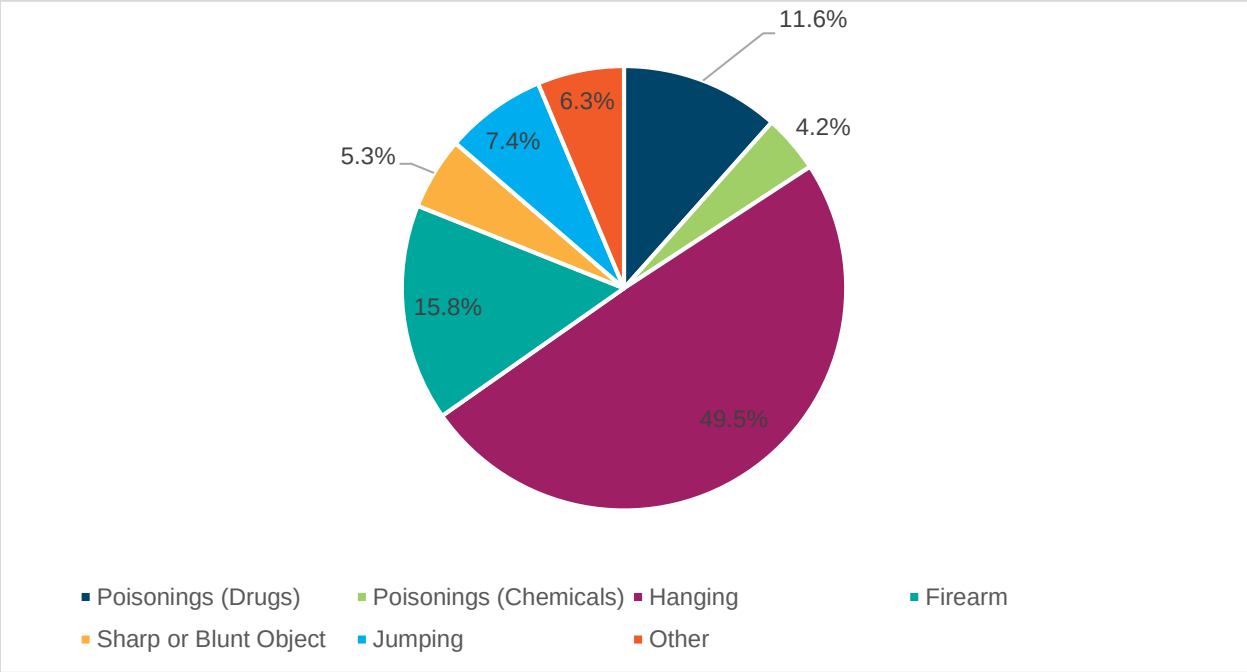
Data source: Vital Statistics, 2019.

Figure 15: Suicide deaths by females, by category (2013-2015) (N=34)



Data source: Vital Statistics, 2019.

Figure 16: Suicide deaths by males, by category (2013-2015) (N=95)



Data source: Vital Statistics, 2019.

4 Conclusion

Over the last number of years, data has shown that self-harm and suicide behaviours have changed significantly. ED visits have significantly increased since 2009, while hospital admissions had a significant decrease from 2009-2015, followed by a significant increase similar to 2009 levels in 2016. Females are more likely to present to EDs and be admitted to hospitals, while males are more likely to die by suicide. In addition, suicide has remained one of the top injury-related reasons for death overall.

By continuing to assess current trends related to self-harm and suicide, key areas of focus can be developed, allowing community partners to work together more effectively and to ensure resources can be used in the most effective way.

References

1. **Niagara Region Public Health.** *Report on Preventable Injuries.* Thorold, ON : s.n., 2010.
2. **Niagara Region Public Health**. *Preventable Injuries in Niagara.* Thorold, ON : s.n., 2017.

Appendix A: ICD-10 Codes Included in Analysis

Code	Description
X60	Intentional self-poisoning by and exposure to non-opioid analgesics, antipyretics and antirheumatics • Ex. NSAIDs
X61	Intentional self-poisoning by and exposure to antiepileptic, sedative-hypnotic, antiparkinsonism and psychotropic drugs, not elsewhere classified • Ex. antidepressants, barbiturates, tranquilizers
X62	Intentional self-poisoning by and exposure to narcotics and psychodysleptics [hallucinogens], not elsewhere classified • Ex. cannabis, cocaine, codeine, heroin, LSD, morphine, opium
X63	Intentional self-poisoning by and exposure to other drugs acting on the autonomic nervous system • Ex. parasympatholytics, spasmolytics, sympatholytics
X64	Intentional self-poisoning by and exposure to other and unspecified drugs, medicaments, and biological substances • Ex. anaesthetics, agents affecting the smooth and skeletal muscles, drugs affecting the cardiovascular and gastrointestinal system
X65	Intentional self-poisoning by and exposure to alcohol
X66	Intentional self-poisoning by and exposure to organic solvents and halogenated hydrocarbons and their vapours • Ex. benzene, and petroleum
X67	Intentional self-poisoning by and exposure to other gases and vapours • Ex. carbon monoxide, motor vehicle exhaust gas, and nitrogen oxides
X68	Intentional self-poisoning by and exposure to pesticides • Ex. herbicides, insecticides
X69	Intentional self-poisoning by and exposure to other and unspecified chemicals and noxious substances • Ex. glue, paints/dyes, fertilizers, poisonous food or plants, soaps/detergents
X70	Intentional self-harm by hanging, strangulation and suffocation
X71	Intentional self-harm by drowning and submersion
X72	Intentional self-harm by handgun discharge
X73	Intentional self-harm by rifle, shotgun and larger firearm discharge
X74	Intentional self-harm by other and unspecified firearm discharge
X75	Intentional self-harm by explosive material

X76	Intentional self-harm by smoke, fire and flames
X77	Intentional self-harm by steam, hot vapours, and hot objects
X78	Intentional self-harm by sharp object
X79	Intentional self-harm by blunt object
X80	Intentional self-harm by jumping from a high place
X81	Intentional self-harm by jumping or lying before moving object
X82	Intentional self-harm by crashing of motor vehicle
X83	Intentional self-harm by other unspecified means
X84	Intentional self-harm by unspecified means
Y87.0	Sequelae (late effects) of intentional self-harm