Poison-Related Attempted and Completed Suicides in Virginia:

2003-2006

Commonwealth of Virginia

Virginia Department of Health

Office of the Chief Medical Examiner, Fatality Review and Surveillance Unit and Office of Family Health Services, Division of Injury and Violence Prevention

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Executive Summary

In our daily life, we constantly interact with substances that can be used as a poison. Prescription and over-the-counter medication, alcohol, carbon monoxide from running motor vehicles, and a variety of common household cleaners and agricultural agents are present in our routine lives. These substances are so familiar that we may not realize their significance to self-inflicted injuries and suicide.

In Virginia, from 2003-2006, there were 17,897 non-fatal suicide attempts and 3,351 completed suicides; this means that there were more than 12 non-fatal poison-related suicide attempts and more than two poison-related completed suicides per day. Poisoning was the most common method used in non-fatal attempts (82.3%) and the third most common method in completed suicides (17.4%). The rate (per 100,000 persons) of attempted poisoning suicides (49.0) was nearly 26 times greater than the rate of completed poisoning suicides (1.9).

This report examines poison-related attempted and completed suicides. Highlights about poison-related suicide-attempts include:

- Females were 29.6 times more likely to be hospitalized for a non-fatal poisoning suicide attempt than males were to complete a poison-related suicide.
- For every Virginian who died from a poison-related suicide, 25 others were hospitalized for a non-fatal attempt.
- Poison-related suicide attempt rates were highest among those ages 15-19 (88.5). Females 15-19 had a poison suicide attempt rate of 123.1, which is 2.5 times the state rate (49.0).
- Poison-related suicide attempt hospitalization rates were highest in the Southwest Health Planning Region of the state (68.4).

Highlights about poison-related completed suicide include:

- Completed suicide rates were highest among Whites (2.4) and those 45-54 year olds (3.7).
- Almost half (47.5%) of all poison-related completed suicide victims disclosed their intent to commit suicide prior to the injury and/or had a history of suicide attempts.
- Over two-thirds (69.9%) of complete suicide victims had a current mental health problem and 63.4% were receiving mental health treatment at the time of injury. An antidepressant was used as a poison in completed suicides by 41.7% of victims with a current mental health problem compared to 13.5% of victims without a current mental health problem.
- A total of 105 different poisons were used by the 583 poisoning suicide victims.
- Most (51.5%) poisoning suicide victims used one poison, 18.2% used two, and 30.4% used three or more poisons to complete the suicide.

Acknowledgements: Virginia Violent Death Reporting System

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Introduction

Introduction

A poison is *any* substance that can be harmful to your body when ingested, inhaled, injected, or absorbed through the skin. *Any* substance can be poisonous if taken incorrectly or in excess, including prescription medication. This definition of poison does not include adverse reactions to medications taken correctly (Centers for Disease Control and Prevention, "Poisoning in").

Poisonings can be either intentional or unintentional. If the person taking or administering a substance did not mean to cause harm, then a poisoning is unintentional. Unintentional poisonings include the use of drugs or chemicals for recreational purposes in excessive amounts, such as an accidental overdose; it also includes the excessive accidental exposure to drugs or chemicals, such as accidental ingestion by a toddler. If the person taking or administering a substance *intended* to cause harm, however, then a poisoning is intentional. Intentional poisonings are primarily suicides, but may also include assaults (CDC, "Poisoning in").

A poison is *any* substance that can be harmful to your body when ingested, inhaled, injected, or absorbed through the skin.

There were 33,300 suicide deaths in the United States in 2006. Of these deaths, 6,109 (18.3%) were the result of a poison. In 2006, approximately 220,924 emergency department visits were the result of intentional self-harm by poisoning (Centers for Disease Control and Prevention, "Web-based Inquiry") and 198,578 poison exposure cases reported to poison control centers were suspected suicide attempts (Bronstein, Spyker, Cantilena, Green, Rumack, & Heard 2006).

In the United States in 2005, men were 1.3 times more likely than women and Whites were 3.6 times more likely than Blacks to have committed suicide by poisoning. Americans 45-49 years old were more likely to commit suicide by poisoning than was any other age group. Poisoning suicide attempts rates were highest for those 15-19 years old (CDC, "Web-based Inquiry"). In 2006, women were 1.6 times more likely than men to receive treatment in an emergency department for a poison-related suicide attempt.

Seventy-five percent of completed poisoning suicides are caused by legal and illegal drugs. The most commonly used drugs identified in poison-related suicides are psychoactive drugs, such as sedatives and antidepressants, followed by opiates and prescription pain medicine (Centers for Disease Control and Prevention, "Wide-ranging OnLine"). According to the Substance Abuse and Mental Health Service Administration, 93% of poison-related suicide attempts involve pharmaceuticals. Among the estimated 132,582 drug-related suicide attempts in the United States in 2005, sedatives and hypnotics, pain medications, and antidepressants were the most common drugs taken. Opiates were the most widely used pain medications, while benzodiazepines were the most common sedatives (Substance Abuse and Mental Health Services Administration, "Drug Abuse").

This report will examine the burden of poison-related completed suicides and suicide attempts in the Commonwealth of Virginia over the course of a four year period (2003-2006). Poison-

related suicide deaths and suicide attempts resulting in hospitalization will be analyzed and compared by examining age, gender, race, method, and geography. The report will also provide an explanation of the poisons used in suicide deaths and an in-depth analysis of the circumstances surrounding the deaths. It is our hope that the information found in this report will be used not only in suicide prevention planning, but also by health care providers as they make decisions about treatment plans and medication monitoring.

Organization of this Report

The first section of the report is a descriptive analysis and comparison of poison-related suicides and suicide attempts. The second section focuses on completed suicides, using VVDRS data reformatted to be comparable with VHI data. The third section describes attempted (non-fatal) suicides using VHI data. A fourth section gives an in-depth analysis of VVDRS data and completed suicides, providing information about specific poisons and circumstances around the suicides.

Throughout, data are presented by gender, race, age, method of injury, and geography. A limited number of tables and graphs are included in the body of the report. Please refer to **Appendix A** for detailed data tables. If further information is desired, please contact the authors of this report. **Appendix B** describes the methods used to prepare this report and limitations of the data.

Section 1: Overview of Poison-Related Suicides and Attempts

Between 2003 and 2006, there were 3,351 completed suicides and 17,897 suicide attempts in Virginia. This means that, on an average day during this period, 2.3 persons completed suicide and 12.3 persons attempted suicide. Those who completed suicide were usually males (77.7%), while most non-fatal attempts were made by females (61.2%).

From 2003-2006, poisoning was the third leading cause of suicide and leading cause of suicide attempts.

In Virginia, poisoning is a common mechanism used in suicides and suicide attempts. From 2003-2006, poisoning was the third leading cause of suicide and the leading cause of suicide attempts. Poison was used in 82.3% of all suicide attempts and 17.4% of all completed suicides (**see Table 1**).

Table 1. Completed Suicides and Suicide Attempts by Mechanism, Virginia 2003-2006

	Suicide Attempts			Completed Suicides		
Mechanism	**#**	**%**	**Rate[1]**	**#**	**%**	**Rate**
Poisoning	14,722	82.3	49.0	583	17.4	1.9
Cut/Pierce	2,185	12.2	7.3	57	1.7	0.3
Firearm	239	1.3	0.8	1,929	57.6	6.4
Fall	90	0.5	0.3	65	1.9	0.2
Suffocation	90	0.5	0.3	630	18.8	2.1
Fire/Flame	45	0.3	0.1	12	0.4	<0.1
Motor Vehicle	20	0.1	0.1	27	0.8	0.1
Hot Object/Substance	10	0.1	<0.1	0	-	-
Drowning/Submersion	3	<0.1	<0.1	47	1.4	0.2
Other Natural/Environmental	2	<0.1	<0.1	0	-	-
Other	491	2.7	1.6	18	0.5	0.1
Total	**17,897**	**100.0**	**59.5**	**3,351**	**100.0**	**11.1**

[1] Rate per 100,000.

When taking into account all mechanisms used, males were almost four times more likely to die from a suicide than females (rates of 17.6 and 4.9, respectively). However, when examining poison-related suicides the male suicide rate (2.1) was only slightly higher than the female rate (1.8). This is due to males more commonly using more lethal methods (i.e., firearms) when attempting suicide.

Section 2: Completed Suicides

Poisoning was the third leading mechanism used in completed suicides in Virginia from 2003-2006. Over the four year period, there were 583 poison-related suicides, accounting for 17.4% of all suicides. The four year poisoning suicide rate was 1.9 per 100,000.

Demographics

Completed suicides occurred most often among Whites, who comprised 91.9% of poisoning suicide victims. The completed poisoning suicide rate for Whites (2.4) was nearly four times the rate for Blacks (0.6) and persons of Other races (0.6). Males were more likely to complete a poison-related suicide than females (rates of 2.1 and 1.8, respectively).

The median age of a poisoning suicide victim was 45. Using poison to complete suicide was more common among the middle-aged and elderly populations of Virginia. Those 45-54 years old made up the largest percentage of suicide victims, accounting for 28.5% of all suicides. They also had a greater risk of completing suicide than any other age group. The poisoning suicide rate increased with age, peaking with those 45-54, and then decreased with age (**see Table 2)**. These findings indicate that, while all age groups have some risk for poison-related suicides, the level of risk increases for those in the middle-age groups.

Table 2. Number, Percent, and Rate of Poison-Related Completed Suicides, Virginia 2003-2006

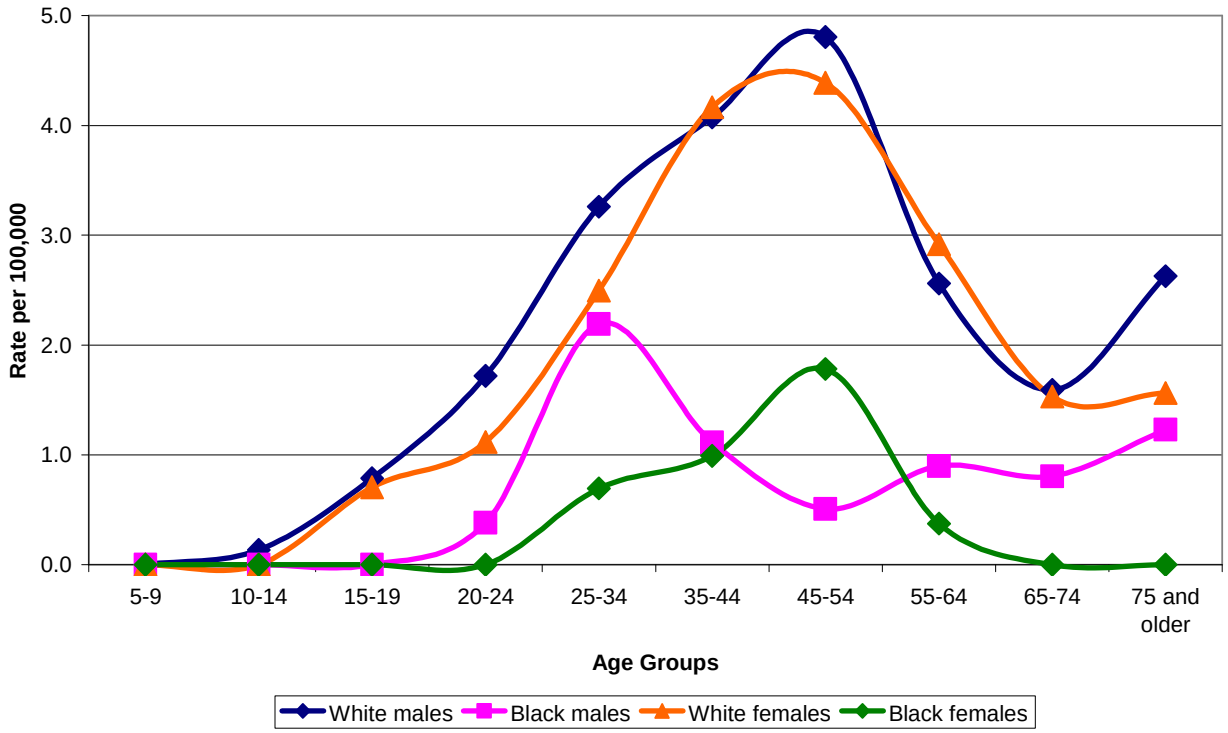
Gender	#	%	Rate[1]
Male	304	52.1	2.1
Female	279	47.9	1.8
Race			
White	536	91.9	2.4
Black	38	6.5	0.6
Other[2]	9	1.5	0.6
Age Group			
5-9	0	-	-
10-14	1	0.2	<0.1
15-19	11	1.9	0.5
20-24	23	3.9	1.1
25-34	100	17.2	2.4
35-44	155	26.6	3.3
45-54	166	28.5	3.7
55-64	73	12.5	2.3
65-74	27	4.6	1.5
75 and older	27	4.6	1.7
Total	**583**	**100.0**	**1.9**

[1] Rate per 100,000.

[2] Other race includes Asian/Pacific Islander, Native American, and those noted as being of an Other or unspecified race.

When examined by gender and race, those 45-54 continued to be at greatest risk for a poisoning suicide, except among Black males (**see Figure 1**). Among Black males, poisoning suicide rates were highest for those 25-34 (rate of 2.2), while for White males, White females, and Black females, the risk increased up to ages 45-54, and then declined again.

Figure 1. Poison-Related Completed Suicides by Gender/Race and Age Group, Virginia 2003-2006



Methods of Fatal Injury

The five leading methods of poison-related completed suicides were psychotropic agents (49.1%), analgesics (41.7%), drugs/medicines NEC[1] (24%), exhaust gases/carbon monoxide NEC (17.3%), and solids/liquids NEC (15.9%). More than one method of poisoning could have been used for completed suicides, so any percentages reported may sum to more than 100%. **Table 3** lists the ten most common methods used in completed poisoning suicides.

Choice of poisoning methods is shaped by a victim's gender, race, and age. For example, psychotropic agents and analgesics were used more often by females than by males. Among females, 61.7% of suicides involved psychotropic agents and 49.5% involved analgesics, whereas 37.5% of male suicide victims used psychotropic agents and 34.5% used analgesics.

[1] NEC stands for "not elsewhere classifiable" which means this method cannot be classified into any other grouping (e.g., into psychotropic agents).

Table 3. Leading Methods of Poison-Related Completed Suicides, Virginia 2003-2006

Rank	Type of Poison	Examples
1	Psychotropic agents	Alprazolam, Bupropion, Citalopram
2	Analgesics	Acetaminophen, Codeine, Fentanyl
3	Drugs/Medicines NEC	Dextromethorphan, Diphenhydramine
4	Exhaust gases/Carbon monoxide NEC	Carbon monoxide
5	Solids/Liquids NEC	Alcohol
6	Sedatives/Hypnotics	Promethazine, Zolpidem
7	Barbiturates	Butalbital, Phenobarbital
8	Corrosives/Caustic agents	Drain cleaner (e.g., Drano)
9	Agricultural agents	Diazinon
10	Gases/Vapors NEC	Freon

Exhaust gases/carbon monoxide NEC were used predominantly by males and Whites. Male suicide victims were over five times more likely than females to have used exhaust gases/carbon monoxide NEC (rates of 0.6 and 0.1, respectively). Similarly, Whites were five times more likely than Blacks to use this method (rates of 0.4 and 0.1, respectively).

Sedatives/hypnotics were used predominantly by females and Whites. Females' rate of sedative/hypnotic use (0.2) was twice that of males (0.1). Whites (0.2) were nine times more likely to have used a sedative/hypnotic than Blacks (<0.1).

Use of psychotropic agents, drugs/medicines NEC, and exhaust gases/carbon monoxide NEC were highest among 45-54 year olds. Rates for these methods increased with age, peaked among 45-54 year olds, and then decreased with increasing age. The use of analgesics and sedatives/hypnotics was highest among 35-44 year olds.

See **Appendix A**, **Table A1** and **Table A2** for a complete list of frequencies, percentages, and rates of poison-related suicide methods by gender, race, and age.

Geography

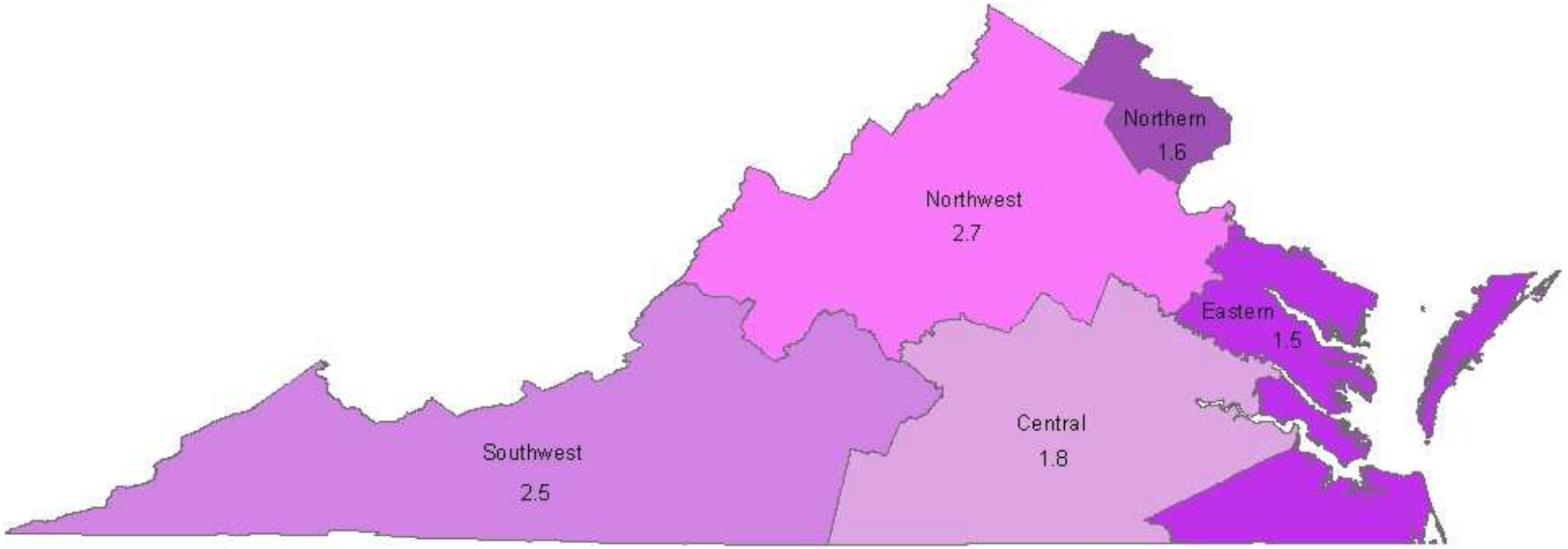
Completed suicides by poison were grouped by Virginia's Health Planning Regions. Poison-related suicide rates were highest in the Southwest (2.5) and Northwest (2.7) regions. Both of these regions have poisoning suicide rates that are higher than the overall state rate of 1.9. Rates were lowest in the Eastern (1.5) and Northern (1.6) regions (**see Figure 2**).

Looking at Health Districts, the highest poisoning suicide rate was in the LENOWISCO[2] Health District in southwest Virginia. The LENOWISCO poisoning suicide rate (3.8) was double the state rate. See **Appendix A**, **Table A7** for a listing of Virginia localities by Health Planning Region, Health District, and Planning District.

See **Appendix A**, **Table A3** and **Table A4** for a complete list of frequencies, percentages, and rates of poison-related suicides by selected geographic types and by locality.

[2] The LENOWISCO Health district is comprised of Lee County, Scott County, Wise County, and the city of Norton.

Figure 2. Rate of Poison-Related Completed Suicides by Virginia Health Planning Region, 2003-2006



Section 3: Suicide Attempts

For every Virginian who dies from a poison-related suicide, 25 are hospitalized for a non-fatal poison-related suicide attempt. From 2003-2006, there were 14,722 poison-related suicide attempt hospitalizations in Virginia, making poisoning the leading cause of suicide attempts in the state. Poisonings accounted for 82.3% of all suicide attempts during the study period. The four year poison-related suicide attempt hospitalization rate was 49.0.

Table 4. Number, Percent, and Rate of Poison-Related Suicide Attempts, Virginia 2003-2006

Gender	#	%	Rate[1]
Male	5,234	35.6	35.4
Female	9,487	64.4	62.1
Unknown	1	<0.1	-
Race			
White	11,165	75.8	49.9
Black	2,383	16.2	38.9
Other[2]	717	4.9	45.7
Unknown	457	3.1	-
Age Group			
5-9	7	<0.1	0.4
10-14	353	2.4	17.2
15-19	1,842	12.5	88.5
20-24	1,790	12.2	83.4
25-34	3,350	22.8	81.8
35-44	3,758	25.5	79.9
45-54	2,440	16.6	55.1
55-64	798	5.4	25.1
65-74	240	1.6	13.1
75 and older	144	1.0	9.1
Total	**14,722**	**100.0**	**49.0**

[1] Rate per 100,000.

[2] Other race includes Asian/Pacific Islander, Native American, and those noted as being of an Other (unspecified) race.

Demographics

While males were more likely to *complete* suicide by poisoning, females were more likely to be *hospitalized* for a poison-related suicide attempt. The rate of female hospitalization due to poison-related suicide attempts (62.1) is nearly twice the rate for males (35.4). Females accounted for 64.4% of all poison-related suicide attempt hospitalizations. For every female who died from a poison-related suicide, there were 34 females who attempted suicide by poisoning (**see Table 4**).

Poison-related suicide attempts occurred most often among Whites, accounting for more than three-quarters of all such attempts. Whites had the highest rate of suicide attempts (49.9), followed closely by Other races (45.7) and Blacks (38.9).

From 2003-2006, there were 14,722 poison-related suicide attempt hospitalizations.

The median age of persons attempting a poisoning-related suicide was 35, ten years younger than the median age for completed poisoning suicide victims (45). Those ages 35-44 made up the largest percentage of person attempting suicide, accounting for one-fourth (25.5%) of all poison-related suicide attempts. However, unlike completed suicides where rates were highest among middle-aged adults, poison-related suicide attempt rates were highest among youth (age groups 15-19 and 20-24). This means that the outcome of attempting suicide by poison is very different for youth and older adults, and may indicate usage of different types or amounts of poisons.

The poison-related suicide attempt rate rose with age, peaked among those 15-19 (88.5), and then decreased again. For each 15-19 year old who completed a poison-related suicide, 167 were hospitalized for a suicide attempt. As age increases, the ratio of completed suicide to attempted suicide decreases, starting at 1:353 for those ages 10-14 and ending at 1:5 for those 75 and older.

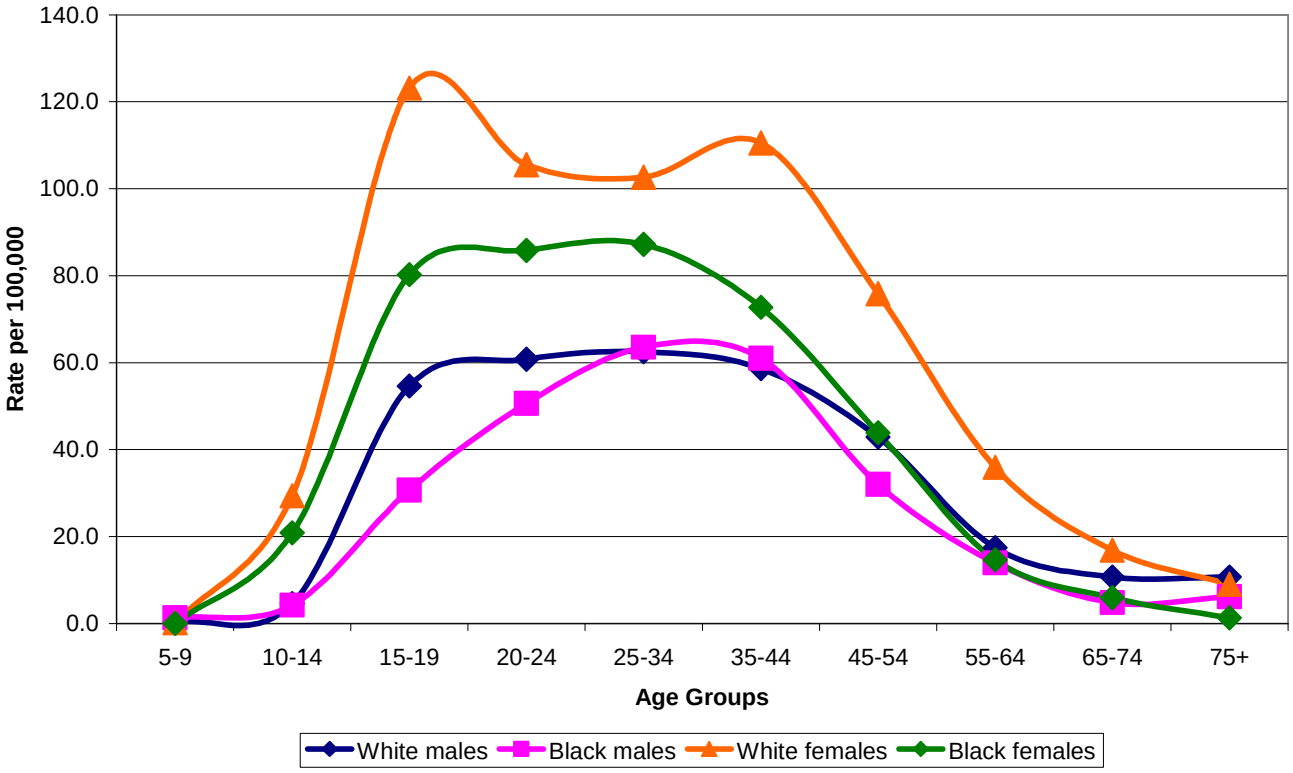
For each 15-19 year old who completed a poison-related suicide, 167 were hospitalized for a suicide attempt.

The overall poison-related suicide attempt rate was higher for females of Other races (64.9) than for White females (63.8). Suicide attempt rates for both of these demographic groups exceeded the overall state rate (49.0). White females 15-44 years old had the greatest risk of poison-related suicide attempt of any group in the state. Their attempt rate (109.2) was double the state rate (49.0) and higher than all other gender, race, and age group combinations. Among White females, the suicide attempt rate was highest among 15-19 years old (123.1).

Black females 15-44 years old were also at increased risk of being hospitalized for a poison-related suicide attempt compared to Black females of other age groups. The suicide attempt rate for this group was 80.6 with 25-34 year olds experiencing the highest rate (87.2). **Figure 3** shows attempted suicides using poisons by age groups for selected gender/race groupings.

See **Appendix A, Table A1** and **Table A2** for a detailed breakdown of frequency, percent and rate of poison-related suicide attempts by gender, race, and age.

Figure 3. Poison-Related Suicide Attempts by Gender/Race and Age Group, Virginia 2003-2006



Methods of Fatal Injury

The five leading methods of poisoning suicide attempts were psychotropic agents (39.6%), analgesics (27.0%), drugs/medicines NEC (23.5%), sedatives/hypnotics (4.0), and solids/liquids NEC (3.6%). The leading methods of poisoning were similar for all demographic breakdowns. The ten most common methods are listed in **Table 5**.

Table 5. Leading Methods of Poison-Related Suicide Attempts, Virginia 2003-2006

Rank	Type of Poison	Examples
1	Psychotropic agents	Alprazolam, Bupropion, Citalopram
2	Analgesics	Acetaminophen, Codeine, Fentanyl
3	Drugs/Medicines NEC	Dextromethorphan, Diphenhydramine
4	Sedatives/Hypnotics	Promethazine, Zolpidem
5	Solids/Liquids NEC	Alcohol
6	Barbiturates	Butalbital, Phenobarbital
7	Corrosives/Caustic agents	Drain cleaner (e.g., Drano)
8	Exhaust gases/Carbon monoxide NEC	Carbon monoxide
9	Agricultural agents	Diazinon, Pesticides
10	Gases/Vapors NEC	Freon

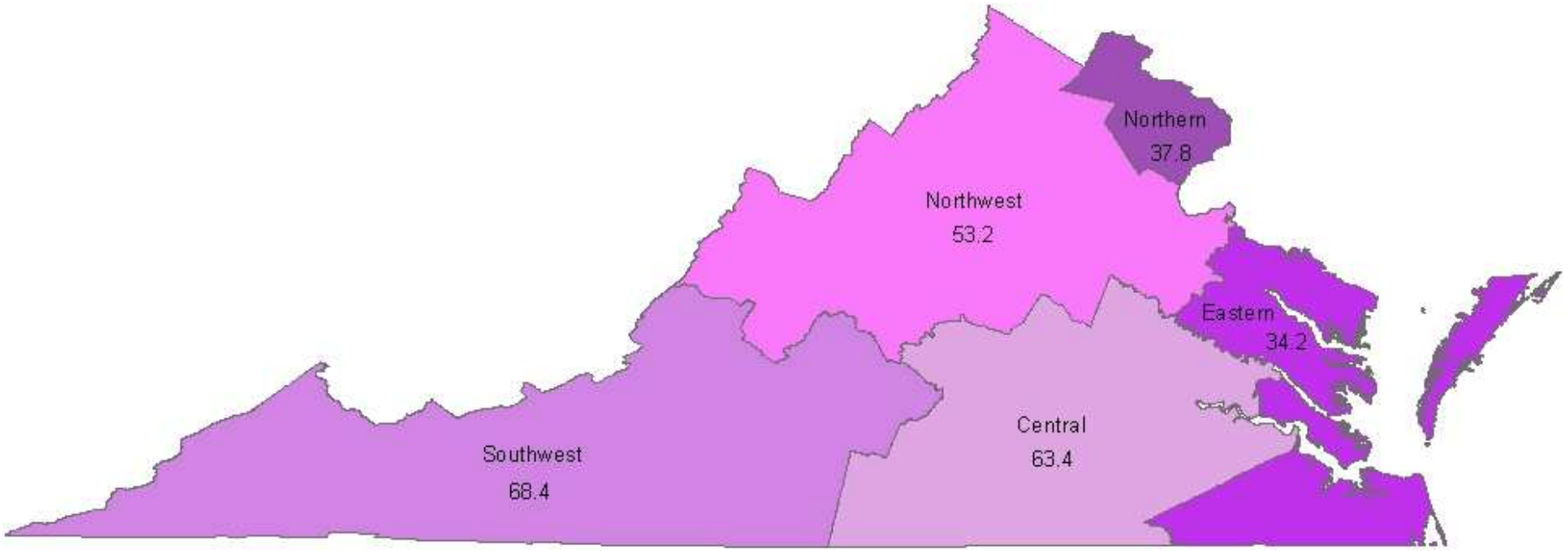
Geography

For Health Planning Regions, poison-related suicide attempt hospitalization rates were lowest in the Eastern region (34.2). The Southwest region had the highest rate (68.4) which exceeded the state rate (49.0) (**see Figure 4**).

As with completed suicides, the highest poison-related suicide attempt rate among Health Districts was in the LENOWISCO Health District, which is located in southwest Virginia. Their poison-related suicide attempt rate (138.9) was almost three times the overall state rate (49.0).

See **Appendix A**, **Table A1** and **Table A2** for a complete list of frequencies, percentages, and rates of poison-related suicides by locality.

Figure 4. Rate of Poison-Related Suicide Attempts by Virginia Health Planning Region, 2003-2006



Section 4: In-depth Analysis of Poison-Related Completed Suicides

The following section presents VVDRS data on specific substances used in the 583 completed poisoning suicides that occurred from 2003-2006. The previous sections grouped poisons into broad classifications that primarily described the intended use of the poisons (e.g., as psychotropic agents). In this section, poisons are classified by how they are accessed (e.g., through a pharmacy). Specific poisons and the number of poisons used in completed suicide are also discussed. This section also presents information about the problems and events that were being experienced by poison-related suicide victims at the time of injury.

Poison Types

The VVDRS coding schema requires that each poison entered into the database be classified into a broad type, defined primarily by how the poison is usually obtained[3,4] (**see Table 6**).

Table 6. Poison Type and Definition in the Virginia Violent Death Reporting System Coding Schema

Type	Definition	Examples
Prescription medications[1]	Medications obtained with a doctor's prescription	Citalopram, Alprazolam
Over-the-Counter (OTC) medications	Medications that do not require a doctor's prescription and are purchased in retail stores	Diphenhydramine, Acetaminophen
Carbon monoxide	A gas or vapor produced from motor vehicles or by burning certain substances	Car exhaust, smoke from charcoal grills
Alcohol	Alcoholic beverages meant for human consumption and sold commercially	Beer, Liquor
Street drugs	Substances that are manufactured *and* sold illegally, and not controlled by the pharmaceutical trade	Cocaine, Heroin
Other poisons[2]	Substances designed to poison animals or as a herbicide; substances not meant for human ingestion	Rat poison; Antifreeze

[1] Prescription medications are any substance controlled by the pharmaceutical trade, regardless of how a specific victim obtained the medication. Oxycodone, for example, is a prescribed medication that is also commonly sold as a street drug. Because Oxycodone is manufactured and sold legally, it is counted as a prescription medication.

[2] Includes the NVDRS category "not applicable."

The VVDRS coding schema allows multiple poisons to be counted for each suicide victim, if applicable. **Table 7** shows the percentage of the 583 suicide victims who used at least one of each poison type.

Frequency of Use of Specific Poisons

The 583 suicide victims in this study period used a total of 105 unique poisons; of these substances, over two-thirds (67.6%) were used by two or more suicide victims. This shows that

[3] For more detail on this coding schema see Section 16 of the NVDRS Coding Manual at: http://www.cdc.gov/ncipc/pub-res/nvdrs-coding/VS2/NVDRS%20Coding%20Manual%20Full.pdf.

[4] See **Appendix A**, **Table A6** for a more detailed description of these poison types including examples of specific poisons.

poisoning suicide victims used a narrow range of substances to complete suicide, and that most substances were used by multiple victims. While it is arguable that a nearly infinite variety of poisons *could* be employed, the actual range was small. **Appendix A**, **Table A5** lists the names and frequencies of all poisons used in completed suicides.

Table 7. Poison Types Used in Poison-Related Completed Suicides, Virginia 2003-2006 (*N*=583)[1]

Type	#	%
Prescription medications[2]	396	67.9
Over-the-Counter (OTC) medications	114	19.6
Carbon monoxide	101	17.3
Alcohol	66	11.3
Street drugs	36	6.2
Other poisons[3]	35	6.0

[1] More than one poison type may be used for each victim. Numbers will not sum to the total number of suicide victims and percentages will not sum to 100%. For example, 64 suicides victims ingested prescription and OTC medications.

[2] Prescription medications are any substance controlled by the pharmaceutical trade, regardless of how a specific victim obtained the medication. Oxycodone, for example, is a prescribed medication that is also commonly sold as a street drug. Because Oxycodone is manufactured and sold legally, it is counted as a prescription medication.

[3] Includes the NVDRS category "not applicable."

Table 8 shows the 20 most common substances[5] used in completed suicides and the differences in usage by gender. At least one of these 20 substances was used in the completion of 506 (87.0%) of all poisoning suicides. All substances listed were considered to have caused or contributed to death. These 20 common substances are primarily prescription medications (70.0%). This means that the substances most commonly used to commit suicide are typically obtained through legitimate means for the purpose of treating medical and mental health conditions. This finding should prompt health care providers to evaluate the practice of prescribing medications to patients who are dealing with issues known to be related to suicide, such as divorce, major illnesses, pending legal problems, and mental health problems.

[5] Each substance was used in 20 or more suicides. See **Appendix A**, **Table A6** for a more detailed description of these poisons.

Table 8. Frequency of Use of Most Common Poisons in Poison-Related Completed Suicides by Gender, Virginia 2003-2006[1,2]

	Male (*n*=304)		Female (*n*=279)		Total (*N*=583)	
Poison	**#**	**%**	**#**	**%**	**#**	**%**
Carbon monoxide	84	27.6	17	6.1	**101**	**17.3**
Alcohol	33	10.9	33	11.8	**66**	**11.3**
Diphenhydramine	25	8.2	34	12.2	**59**	**10.1**
Oxycodone	29	9.5	29	10.4	**58**	**9.9**
Amitriptyline/Nortriptyline[3]	17	5.6	38	13.6	**55**	**9.4**
Citalopram	16	5.3	39	14.0	**55**	**9.4**
Methadone	28	9.2	26	9.3	**54**	**9.3**
Acetaminophen	16	5.3	37	13.3	**53**	**9.1**
Hydrocodone	21	6.9	22	7.9	**43**	**7.4**
Alprazolam	18	5.9	23	8.2	**41**	**7.0**
Morphine	14	4.6	22	7.9	**36**	**6.2**
Quetiapine	18	5.9	18	6.5	**36**	**6.2**
Propoxyphene	13	4.3	18	6.5	**31**	**5.3**
Cocaine	17	5.6	12	4.3	**29**	**5.0**
Diazepam	16	5.3	13	4.7	**29**	**5.0**
Ethylene glycol[4]	17	5.6	8	2.9	**25**	**4.3**
Fluoxetine	9	3.0	16	5.7	**25**	**4.3**
Bupropion	7	2.3	16	5.7	**23**	**3.9**
Tramadol	12	3.9	11	3.9	**23**	**3.9**
Zolpidem	7	2.3	14	5.0	**21**	**3.6**

[1] Includes all poisons used to complete 20 or more suicides.

[2] More than one poison may be used for each victim. Numbers will not sum to the total number of suicide victims and percentages will not sum to 100%. For example, 13 suicide victims used alcohol and Diphenhydramine.

[3] Nortriptyline appears in two forms: as an independent prescription medication and as a metabolite of the prescription medication Amitriptyline. These two forms are combined in this report, as it is not always clear if Nortriptyline was present as an independent medication or as a metabolite.

[4] Includes Ethylene glycol, glycol, and methanol.

Table 8 shows that persons who complete a poison-related suicide employed a variety of options. For example, 25 persons (4.3% of the total) used ethylene glycol (antifreeze) to complete suicide, indicating that unconventional poisons may be used in absence of access to other options, or even as a preferred poison. The most common poison, carbon monoxide (17.3%), is available from multiple sources including charcoal grills and lawn mowers. This makes efforts to limit access extremely difficult. Alcohol, the second most common poison (11.3%) and Diphenhydramine (commonly sold as Benadryl), the third most common poison (10.1%), are both easily available and accessible. While friends and family members try to prevent suicides by limiting access to prescription medications, it should also be known that the most common poisons are easily available and accessible, and that persons who are thought to be at risk for suicide do use less conventional options.

There was considerable similarity among demographic groups in use of these common poisons. At least one of these 20 poisons was used by 88.2% of males, 86.8% of Blacks, 86.6% of Whites, 85.3% of females, and by nearly two-thirds or more of every age group.

Some of the main differences in choice of specific poison were between males and females. Males used carbon monoxide 4.5 times more often and ethylene glycol almost twice as often as females. Females ingested Acetaminophen 2.5 times more often, Citalopram 2.7 times more often, and Amitriptyline/Nortriptyline 2.4 times more often than males. These differences demonstrate that prevention practices must consider the individual characteristics of those at risk.

For many victims (57.6%), *all* of the poisons used came from this list of the 20 most common; this was more common for Whites (58.0%) than Blacks (47.4%) and for males (65.1%) than females (49.5%).

Number of Poisons

The number of poisons used in each completed suicide was analyzed (**see Table 9**). Most (51.5%) poisoning suicide victims used one poison, 18.2% used two, and 30.4% used three or more. This finding demonstrates that poisoning suicides can be completed with minimal effort and planning.

Most (51.5%) poisoning suicide victims used one poison…

Males used only one poison more often than females, who in contrast used three or more poisons more often. Females comprised 47.9% of all poisoning suicide victims, but were 61.0% of persons who used three or more poisons. Nearly equal percentages of Whites and Blacks used one poison (51.1% and 50.0%, respectively). While there were notable variations by age group, the median ages for those taking one poison (46), two poisons (45), and three poisons (44) were similar.

Table 9. Number of Poisons Used in Poison-Related Completed Suicides by Selected Demographics, Virginia 2003-2006

	One		Two		Three or more		Total	
Gender	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**
Male	180	59.2	55	18.1	69	22.7	**304**	**100.0**
Female	120	43.0	51	18.3	108	38.7	**279**	**100.0**
Race								
White	274	51.1	97	18.1	165	30.8	**536**	**100.0**
Black	19	50.0	9	23.7	10	26.3	**38**	**100.0**
Other[1]	7	77.8	0	-	2	22.2	**9**	**100.0**
Age Group								
10-14	0	-	0	-	1	100.0	**1**	**100.0**
15-19	8	72.7	2	18.2	1	9.1	**11**	**100.0**
20-24	14	60.9	3	13.0	6	26.1	**23**	**100.0**
25-34	52	52.0	12	12.0	36	36.0	**100**	**100.0**
35-44	67	43.2	35	22.6	53	34.2	**155**	**100.0**
45-54	89	53.6	30	18.1	47	28.3	**166**	**100.0**
55-64	35	47.9	15	20.5	23	31.5	**73**	**100.0**
65-74	16	59.3	5	18.5	6	22.2	**27**	**100.0**
75 and older	19	70.4	4	14.8	4	14.8	**27**	**100.0**
Total	**300**	**51.5**	**106**	**18.2**	**177**	**30.4**	**583**	**100.0**

[1] Other race includes Asian/Pacific Islander, Native American, and those noted as being of an Other (unspecified) race.

There is a relationship between the number of poisons and the specific poison or poisons. Certain poisons were almost always taken by themselves, such as ethylene glycol (96.0% of the time). Others poisons were typically taken in conjunction with one or more other poison, as was the case with alcohol (98.5% of the time). **Table 10** shows the 20 most common poisons based on the number of poisons used.

Table 10. Frequency of Use of Twenty Most Common Poisons by Number of Poisons in Poison-Related Completed Suicides, Virginia 2003-2006[1,2]

	One poison (*n*=300)		Two poisons (*n*=106)		Three or more poisons (*n*=177)		Total (*N*=583)	
Poison	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**
Carbon monoxide	97	96.0	3	3.0	1	1.0	**101**	**100.0**
Alcohol	1	1.5	24	36.4	41	62.1	**66**	**100.0**
Diphenhydramine	14	23.7	9	15.3	36	61.0	**59**	**100.0**
Oxycodone	12	20.7	4	6.9	42	72.4	**58**	**100.0**
Amitriptyline/Nortriptyline[3]	21	38.2	11	20.0	23	41.8	**55**	**100.0**
Citalopram	4	7.3	13	23.6	38	69.1	**55**	**100.0**
Methadone	9	16.7	16	29.6	29	53.7	**54**	**100.0**
Acetaminophen	14	26.4	12	22.6	27	50.9	**53**	**100.0**
Hydrocodone	2	4.7	7	16.3	34	79.1	**43**	**100.0**
Alprazolam	2	4.9	5	12.2	34	82.9	**41**	**100.0**
Morphine	10	27.8	3	8.3	23	63.9	**36**	**100.0**
Quetiapine	8	22.2	10	27.8	18	50.0	**36**	**100.0**
Propoxyphene	3	9.7	9	29.0	19	61.3	**31**	**100.0**
Cocaine	3	10.3	7	24.1	19	65.5	**29**	**100.0**
Diazepam	0	-	2	6.9	27	93.1	**29**	**100.0**
Ethylene glycol[4]	24	96.0	1	4.0	0	-	**25**	**100.0**
Fluoxetine	2	8.0	4	16.0	19	76.0	**25**	**100.0**
Bupropion	5	21.7	5	21.7	13	56.5	**23**	**100.0**
Tramadol	4	17.4	6	26.1	13	56.5	**23**	**100.0**
Zolpidem	0	-	7	33.3	14	66.7	**21**	**100.0**

[1] Includes all poisons used to complete 20 or more suicides.

[2] More than one poison may be used for each victim. Numbers will not sum to the total number of suicide victims and percentages will not sum to 100%. For example, 13 suicides victims used alcohol and Diphenhydramine.

[3] Nortriptyline appears in two forms: as an independent medication and as a metabolite of Amitriptyline. These two forms are combined in this report, as it is not always clear if Nortriptyline was present as its own substance or as a metabolite.

[4] Includes Ethylene glycol, glycol, and methanol.

Circumstances

This section discusses suicide circumstances that are collected in the VVDRS. For every completed suicide entered into the database, circumstances of the suicide are coded, if known. Circumstances are problems, events, and life stressors; they also include indications of preventability, such as the victim disclosing intent to commit suicide. Some circumstances (e.g., physical health problems) require proof that they contributed or led to the suicide. Other circumstances *may* have contributed or led to the suicide, but only require mention in the death investigation record (e.g., intimate partner problems) (**see Table 11**).

Table 11. Selected Circumstances of Poison-Related Completed Suicide Victims, Virginia 2003-2006 (*N*=569)[1,2]

Mental Health Characteristics	#	%
Current Mental Health Problem	398	69.9
Diagnosis of Depression	287	50.4
Diagnosis of Bipolar	82	14.4
Diagnosis of Anxiety Disorder	39	6.9
Diagnosis of Schizophrenia	24	4.2
Current and Noncurrent Mental Health Treatment[3]	374	65.7
Current Mental Health Treatment	*361*	*63.4*
Noncurrent Mental Health Treatment	*13*	*2.3*
Substance Use Characteristics		
No Problem with Alcohol or Other Substances	360	63.3
Problem with Alcohol and/or Other Substances[4]	209	36.7
Problem with Alcohol	*54*	*9.5*
Problem with Other Substances	*103*	*18.1*
Problem with both Alcohol and Other Substances	*52*	*9.1*
Relationship Characteristics		
Intimate Partner Problem	154	27.1
Non-Intimate Partner Relationship Problem	41	7.2
Life Stressor Characteristics		
Physical Health Problem	130	22.8
Financial Problem	52	9.1
Recent Criminal Legal Problem	50	8.8
Other Death of Family Member/Friend	38	6.7
Job Problem	37	6.5
Noncriminal Legal Problem	14	2.5
Suicide of Family Member/Friend	8	1.4
School Problems	3	0.5
Event Characteristics		
History of Suicide Attempt	199	35.0
Current Depressed Mood	181	31.8
Crisis within Two Weeks of the Suicide	143	25.1
Disclosed Intent to Commit Suicide[5]	122	21.4

[1] More than one characteristic may be noted for each victim. Numbers will not sum to the total victims nor sum to 100%. Percentages are based on the number of suicides where characteristics are known.

[2] For complete characteristic descriptions, see Section 7 of the NVDRS Coding Manual at: http://www.cdc.gov/ncipc/pub-res/nvdrs-coding/VS2/NVDRS%20Coding%20Manual%20Full.pdf.

[3] Treatment is current if received within the two months preceding the suicide and noncurrent if received at some point in the past, but not within the two months preceding the suicide.

[4] Includes victims who had a positive cocaine test, but did not die from cocaine poisoning.

[5] Beginning with the 2006 database, suicidal ideation was collected systematically. Ideation refers to suicidal references or thoughts that are not specific or clear enough to label as Disclosed Intent to Commit Suicide.

Mental Health

A mental health problem is noted for persons who have been diagnosed with a mental health disorder or syndrome or are receiving mental health services for unspecified issues. A current mental health problem was common among poisoning suicide victims (69.9%). One-fourth (24.3%) of all suicide victims with a mental health problem completed suicide using a poison, compared to 10.7% of those without a mental health problem. While suicide victims with mental

health problems most commonly use firearms to complete suicides (47.4%), they are over-represented in poison-related suicide deaths. This trend toward use of poisons should be incorporated into suicide prevention literature and become a consideration for health care providers prescribing medications for patients with mental health problems and indications of suicidality.

A current mental health problem was common among poisoning suicide victims (69.9%).

Half (50.0%) or more of every age group had a current mental health problem, with the highest percentages for those 35-44 (70.9%), 45-54 (75.5%), 55-64 (72.6%), and 65-74 (76.0%). The median ages of those with and without current mental health problems (45 and 43, respectively) were similar. Mental health problems were more common for Blacks (81.1%) than Whites (69.5%) and for females (78.5%) than males (62.0%). Most persons with mental health problems (90.6%) were receiving mental health treatment (e.g., counseling, medication) within the two months preceding the fatal injury and an additional 3.2% had received mental health treatment in the past, but not in the two months preceding the suicide.

Alcohol and Other Substance Problems[6]

Problems with alcohol or other substances are noted if the victim was perceived by self or others to have an addiction to or a problem controlling use of alcohol or other substances. A problem with alcohol and/or other substances was noted for over one-third (36.7%) of victims. Of these persons, nearly half (49.3%) had a problem with other substances only, and similar proportions had a problem with alcohol only (25.8%) and with both alcohol and other substances (24.9%). Problems with alcohol and/or other substances were most common among those ages 25-34 (51.0%) and 35-44 (45.7%). The median age of a victim with an alcohol problem only (50) was notably higher than those with a problem with other substances only (40) and those with an alcohol and other substance problem (42). Those with no alcohol or other substance problem had a median age of 47.

Nearly identical percentages of males (36.6%) and females (36.9%) were noted as having a problem with alcohol and/or other substances. Blacks more commonly had a problem with alcohol and/or other substances than Whites (40.5% and 37.0%, respectively). Among those with these problems, females primarily had a problem with other substances only (59.4%, compared to 39.8% of males) and Blacks most often had a problem with others substances only when compared to Whites (66.7% and 47.9%, respectively).

History of Suicide Attempts/Disclosed Intent to Commit Suicide

Over one-third (35.0%) of persons who completed a poison-related suicide had previously attempted suicide. In general, younger age groups had a higher occurrence of prior attempts; the highest percentage was for those ages 15-19 (63.6%) while the lowest was for those ages 75 and older (25.9%). This correlates with information from **Table 4** that those ages 15-19 are nearly 10 times more likely to be hospitalized for a suicide attempt than those ages 75 and over. Median age for victims with prior attempts (44), however, was similar to those without (45).

[6] Other substances include any use of illegal drugs (e.g., cocaine) with exceptions made for casual marijuana use; any use of inhalants (e.g., sniffing paint fumes); and abuse of prescription or over-the-counter medications.

Females had higher frequencies of prior attempts than males (39.1% and 31.2%, respectively) and a higher median age for those with prior attempts (46) than their male counterparts (41). Whites and Blacks had nearly identical percentages with prior suicide attempts (35.2% and 35.1%, respectively).

Victims disclosed their intent to commit suicide[7] in over one-fifth (21.4%) of completed poisoning suicide cases. There were differences among age groups, but the median age of those who had and had not disclosed intent was identical (45). Female poisoning suicide victims less often disclosed intent than their male counterparts (16.4% and 26.1%, respectively) and were older (median ages of 49 and 43, respectively).

Combined, 47.5% of poisoning suicide victims either disclosed intent and/or had a history of suicide attempts. This means that nearly half of all victims made known their risk for suicide and presented an opportunity for intervention. One avenue for prevention is educating friends and family members how to react when a loved one expresses thoughts of suicide or discloses intent to commit suicide. Commonly, the persons to whom intent was disclosed report that they did not take the threats seriously or did not believe the victim would *actually* commit suicide. The general public must be educated on the prevalence of suicide and how to deal with persons who are at risk.

Combined, 47.5% of poisoning suicide victims either disclosed intent and/or had a history of suicide attempts.

Intimate Partner Problems

Intimate partner problems are frictions or conflicts (e.g., arguments, separations, divorces) between intimate partners (e.g., spouses, girl/boyfriends, ex-spouses). (Difficulties with an intimate partner were noted for 27.1% of all victims. These problems were more frequently noted for Whites (27.6%) than Blacks (18.9%). Males had these problems slightly more often than females (28.5% and 25.5%, respectively). The median age of a victim with this problem was 40, seven years younger than those without this problem. Those ages 20-24 had the highest frequency of intimate partner problems (45.5%) followed by those 25-34 (40.6%).

Physical Health Problems

Physical health problems include a wide-range of health issues such as pain; cancer; and other health problems like diabetes, heart conditions, and mobility issues.[8] Problems with physical health were a contributing factor for 22.9% of all poisoning suicide victims, and for more than half (55.6%) of older adults ages 75 and older. The median age of a victim with a physical health problem was 50 compared to a median age of 44 for others. Physical health problems were more frequently noted for Blacks (29.7%) than Whites (22.1%) and for females (27.4%) than males (18.6%).

[7] Suicide victims were noted as disclosing intent if they spoke of suicide either explicitly ("I'm going to kill myself") or implicitly ("I know how to make my pain go away") *and* there was time for intervention between these statements and the infliction of the fatal injury.

[8] Physical health problems are viewed from the perspective of the victim; if he or she noted that a physical health problem led to the suicide, it was counted as such.

Victims with physical health issues tended to have a lower occurrence of other circumstances that influence suicides. While they had a mental health problem as frequently as those without a physical health problem (69.2 and 70.2%, respectively), they less frequently experienced a crisis in the past two weeks (16.9% compared to 27.6%), an intimate partner problem (10.8% compared to 31.9%), or criminal legal problems (3.1% compared to 10.5%). This shows that physical health problems may not need co-occurring life-stressors to create suicidality.

Crisis in the Past Two Weeks

A life crisis within the two weeks preceding the suicide was relevant for one-fourth (25.1%) of poisoning suicide victims.[9] Crises can include a variety of problems and events, including intimate partner problems, criminal legal problems, and physical health problems. Those with a precipitating life crisis were younger (median age of 41) than those who did not (median age of 46); this was a factor for 40.9% of those ages 20-24, but for just 14.8% of older adults ages 75 and older.

Those with a life crisis appeared to be dealing with fewer long-term chronic problems. Of those with a life crisis, 15.4% were experiencing physical health problems compared to 25.4% of others; similarly 15.4% had mental health problems compared to 25.4% of others. Persons with a life-crisis did seem to be experiencing more immediate and acute problems. Nearly three-fifths (59.4%) of persons noted with a life crisis were having problems with an intimate partner compared to 16.2% of others. Similarly, criminal legal problems[10] were a factor for 19.6% of those with a life crisis compared to 5.2% of others.

These circumstances that correlate with a recent life crisis were more common with younger victims. Those with intimate partner problems had a median age of 40 compared to 47 for those without this problem. Persons with criminal legal problems were slightly younger than those who did not (median ages of 43 and 45, respectively), however no victims over age 61 reported criminal legal problems.

A life crisis… does not appear to incite suicidality where it did not previously exist.

A life crisis, however, does not appear to incite suicidality where it did not previously exist. Those with a crisis had a similar frequency of prior suicide attempts (32.9%) as those without a crisis (35.7%). It does not appear that a victim's reaction to a life crisis was systematically linked to a casual influence of alcohol or other substances. Person with a recent crisis had a slightly higher frequency of testing positive for intoxicating[11] levels of alcohol (8.2%) than others (7.8%).[12] Those with a recent life crisis were

[9] Life crises are viewed from the perspective of the victim; if he or she perceived a situation or event as a crisis, it was counted as such.
[10] Criminal legal problems involve felony charges that are non-civil in nature.
[11] Victims were counted as intoxicated if they had a blood alcohol content (BAC) at or above .08. This BAC is the legal standard for intoxication in Virginia.
[12] Percentages for positive toxicology results are based upon the number of victims with post-mortem tests for this substance and exclude suicide victims who used this substance to poison themselves.

more commonly found to have been using cocaine at the time of the suicide (8.3%, compared to 4.8% of others) and slightly more commonly found to have been using opiates (12.7%, compared to 11.3% of others).

While a life crisis does not appear to necessarily create suicidality, these findings do draw attention to a subgroup of suicide victims who reacted to what they perceived as a catastrophe. What others may perceive as a mild problem, or something that the person will eventually overcome, may be enough of a problem to lead the individual to commit suicide. Life crises should be of special concern for younger persons, and those going through intimate partner problems or other acute crises.

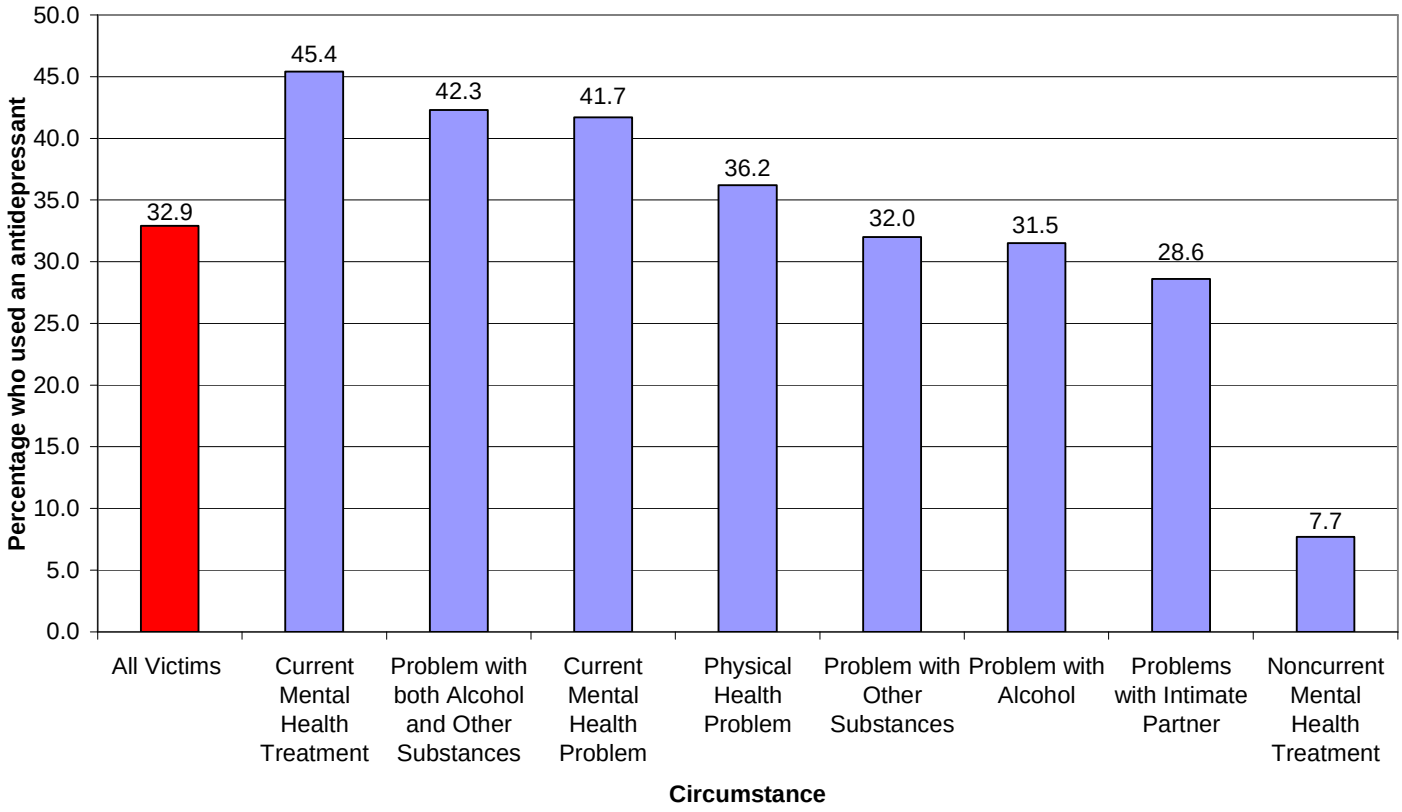
Relationship between Poison Types and Circumstances

The poison types used varied by circumstance. While there are many reasons a suicide victim would select a poison, one possible reason is access. For example, persons with a cocaine problem likely know how to obtain street drugs, and will have a better notion of what quantity may be lethal. Similarly, persons receiving current mental health treatment or treatment for physical health problems may have access to prescription drugs. Knowing the linkage between poisons types and circumstances may assist in prevention efforts.

An antidepressant was used as a poison by over two-fifths (41.7%) of those with a current mental health problem compared to 13.5% of others. Victims who were receiving current mental health treatment more frequently used an antidepressant than those who had received mental health treatment in the past, but not in the two months preceding the suicide (45.4% and 7.7%, respectively). This creates a problem for mental health professionals who need to prescribe medications without simultaneously providing the means to attempt or complete suicide (**see Figure 5**).

An antidepressant was used as a poison by 41.7% of those with a current mental health problem compared to 13.5% of others.

Figure 5. Frequency of Poison-Related Completed Suicide Using an Antidepressant by Selected Suicide Circumstances, Virginia 2003-2006



Opiates were used by over half of those with a problem with other substances (53.4%), but by less than one-third (30.7%) of those with no such problem. Persons with physical health problems more commonly used at least one opiate (47.7%) than others (32.8%) (**see Figure 6**).

Figure 6. Frequency of Poison-Related Completed Suicide Using an Opiate by Selected Suicide Circumstances, Virginia 2003-2006

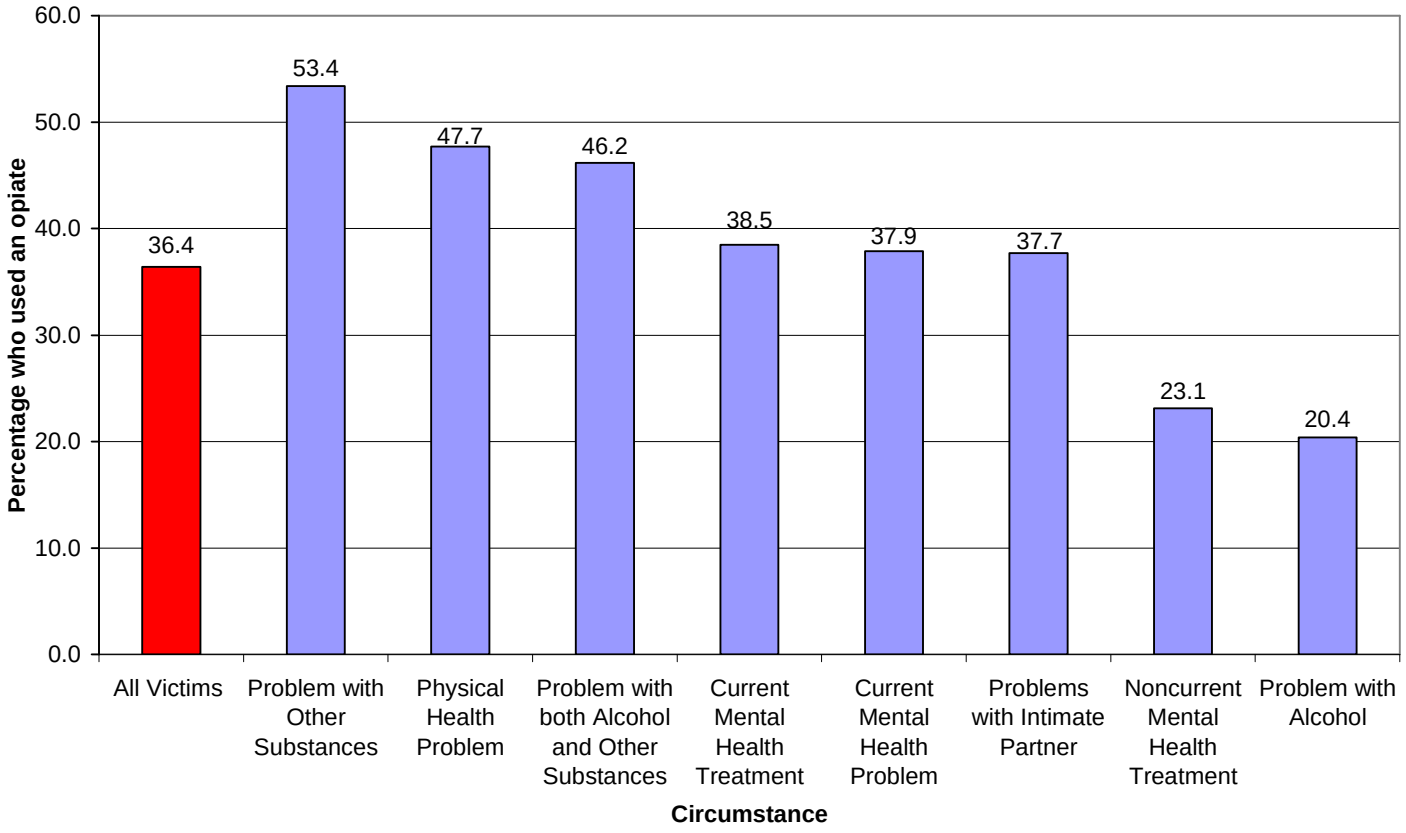


Table 12 shows selected characteristics and the type of poison used.

Table 12. Type of Poison and Selected Circumstances of Poison-Related Completed Suicide Victims, Virginia 2003-2006[1,2]

	Prescription Medications[3] (*n*=389)		OTC Medications (*n*=113)		Carbon Monoxide (*n*=95)		Alcohol (*n*=66)		Street Drugs (*n*=36)		Other Poisons[4] (*n*=35)	
Mental Health Characteristics	#	%	#	%	#	%	#	%	#	%	#	%
Current Mental Health Problem	312	80.2	73	64.6	41	43.2	46	69.7	27	75.0	20	57.1
Current and Noncurrent Mental Health Treatment[5]	299	76.9	68	60.2	34	35.8	44	66.7	25	69.4	19	54.3
Current Mental Health Treatment	*293*	*75.3*	*66*	*58.4*	*30*	*31.6*	*42*	*63.6*	*23*	*63.9*	*16*	*45.7*
Noncurrent Mental Health Treatment	*6*	*1.5*	*2*	*1.8*	*4*	*4.2*	*2*	*3.0*	*2*	*5.6*	*3*	*8.6*
Substance Use Characteristics												
No Problem with Alcohol or Other Substances	233	59.9	76	67.3	74	77.9	35	53.0	8	22.2	21	60.0
Problem with Alcohol and/or Other Substances[6]	156	40.1	37	32.7	21	22.1	31	47.0	28	77.8	14	40.0
Problem with Alcohol	*32*	*8.2*	*12*	*10.6*	*9*	*9.5*	*12*	*18.2*	*3*	*8.3*	*6*	*17.1*
Problem with Other Substances	*85*	*21.9*	*18*	*15.9*	*9*	*9.5*	*7*	*10.6*	*17*	*47.2*	*3*	*8.6*
Problem with both Alcohol and Other Substances	*39*	*10.0*	*7*	*6.2*	*3*	*3.2*	*12*	*18.2*	*8*	*22.2*	*5*	*14.3*
Relationship Characteristics												
Intimate Partner Problem	104	26.7	28	24.8	30	31.6	22	33.3	10	27.8	7	20.0
Life Stressor Characteristics												
Physical Health Problem	97	24.9	29	25.7	15	15.8	11	16.7	9	25.0	9	25.7
Event Characteristics												
History of Suicide Attempt	143	36.8	38	33.6	21	22.1	21	31.8	11	30.6	17	48.6
Crisis within Two Weeks of the Suicide	87	22.4	28	24.8	30	31.6	12	18.2	7	19.4	9	25.7
Disclosed Intent to Commit Suicide[7]	80	20.6	19	16.8	23	24.2	12	18.2	8	22.2	8	22.9

[1] More than one characteristic may be noted for each victim, and each victim may have taken more than one type of poison. Numbers will not sum to the total victims nor sum to 100%. Percentages are based on the number of suicides where characteristics are known.

[2] For complete characteristic descriptions, see Section 7 of the NVDRS Coding Manual at: http://www.cdc.gov/ncipc/pub-res/nvdrs-coding/VS2/NVDRS%20Coding%20Manual%20Full.pdf.

[3] Prescription medications are any substance controlled by the pharmaceutical trade, regardless of how a specific victim obtained the medication. Oxycodone, for example, is a prescribed medication that is also commonly sold as a street drug. Because Oxycodone is manufactured and sold legally, it is counted as a prescription medication.

[4] Includes the NVDRS category "not applicable."

[5] Treatment is current if received within the two months preceding the suicide and noncurrent if received at some point in the past, but not within the two months preceding the suicide.

[6] Includes victims who had a positive cocaine test, but did not die from cocaine poisoning.

[7] Beginning with the 2006 database, suicidal ideation was collected systematically. Ideation refers to suicidal references or thoughts that are not specific or clear enough to label as Disclosed Intent to Commit Suicide.

Summary and Conclusions

Poison-related suicide is a major public health concern in Virginia. From 2003-2006, 583 Virginians died from a poison related suicide and another 14,722 individuals attempted suicide using a poison. Non-fatal attempts that resulted in hospitalization were over 25 times more common than completed suicides. As the data in this paper on attempted suicide include only those whose attempts resulted in hospitalizations, this 1:25 ratio should be taken as an *underestimate.*

This analysis suggests that the pictures of those who *attempt* suicide and those who *complete* suicide are very different. Among poison-related injuries, females were 1.8 times more likely than males to attempt suicide with a poison while males were 1.1 times more likely to complete a poison-related suicide. Additionally, the median age for a poison-related suicide victim was 45 years old, ten years older than the median age for non-fatal suicide injuries. Adults 45-54 years old are more likely to complete a poison-related suicide than any other age group. However, youth between the ages of 15 and 19 are more likely to be hospitalized for a poison-related suicide attempt than any other age group. The demographic differences between completed and suicide attempt victims should be incorporated into suicide prevention literature and practices.

A relatively narrow range of substance types and specific poisons were used in completed suicides and most victims used only one poison (51.5%). Twenty different substances accounted for nearly 58% of the variety of poisons used in completed suicides. Most poison-related suicides (67.9%) involved the use of at least one prescription medication. This means that access to and use of the primary poison type is already regulated and monitored; improved regulation and monitoring of a small number of prescription drugs could have dramatic impacts on the poison-related suicide rate.

…improved regulation and monitoring of a small number of prescription drugs could have dramatic impact on poison-related suicide rates.

Poison-related suicide victims have a high occurrence of mental illness (69.9%), with most of these persons (90.6%) receiving mental health treatment at the time of their suicide. Those with a mental illness used as a method of fatal injury the prescribed medications designed to help them. Persons with a mental health issue used an antidepressant as a poison over three times more frequently than those without a mental illness. One of the quandaries of health care providers is how to provide patients with the medication needed for treatment without also providing the means for completing suicide.

The suicide deaths and suicide attempt injuries examined for this report could have been prevented. Nearly half (47.5%) of poison-related suicide victims either disclosed intent to commit suicide, spoke openly about suicide, or had one or more prior suicide attempts. It is important for the public to be aware of the warning signs of suicidal ideation and to take them seriously.

Warning signs of suicide can include:

- making suicidal threats or statements about wanting to die
- expressing feelings of being trapped
- previous suicide attempts
- seeking access to lethal means (i.e., stock piling pills)
- long periods of depression
- change in sleeping habits
- giving away prized possessions
- recent recklessness and taking unnecessary risks
- increasing alcohol or drug use
- sudden changes in mood or behavior
- withdrawal from family, friends, and society

If you believe you know someone who is suicidal remember to ASK, LISTEN, and REFER. Start by telling the person you are concerned about them and give examples of why. Directly ask the individual if they are having thoughts of suicide. Listen to what the individual has to say. Do not judge or try to solve the problem; focus on getting the person help. Contact a counselor, mental health professional, local crisis center, or call the National Suicide Prevention Lifeline at 1-800-273-TALK (8255).

The opportunity for prevention can intersect at several points: family, friends, co-workers, medical doctors, mental health professionals, pharmacists, and many others. The information contained in this paper should be used to frame and inform suicide prevention planning, outreach, and the medical community's decisions around treatment plans and medication monitoring.

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Appendix A: Supplementary Tables

Table A1. Basic Demographics and Methods of Poison-Related Attempted and Completed Suicide, Virginia 2003-2006

	Suicide Attempts			Completed Suicide		
Gender	**#**	**%**	**Rate[1]**	**#**	**%**	**Rate**
Male	5,234	35.6	35.4	304	52.1	2.1
Female	9,487	64.4	62.1	279	47.9	1.8
Unknown	1	<0.1	-	0	-	-
Race[2]						
White	11,165	75.8	49.9	536	91.9	2.4
Black	2,383	16.2	38.9	38	6.5	0.6
Other	717	4.9	45.7	9	1.5	0.6
Unknown	457	3.1	-	0	-	-
Age Group						
5-9	7	<0.1	0.4	0	-	-
10-14	353	2.4	17.2	1	0.2	<0.1
15-19	1,842	12.5	88.5	11	1.9	0.5
20-24	1,790	12.2	83.4	23	3.9	1.1
25-34	3,350	22.8	81.8	100	17.2	2.4
35-44	3,758	25.5	79.9	155	26.6	3.3
45-54	2,440	16.6	55.1	166	28.5	3.7
55-64	798	5.4	25.1	73	12.5	2.3
65-74	240	1.6	13.1	27	4.6	1.5
75 and older	144	1.0	9.0	27	4.6	1.7
Method of Fatal Injury						
Psychotropic agents	5,832	39.6	19.4	286	49.1	1.0
Analgesics	3,978	27.0	13.2	243	41.7	0.8
Drugs/Medicines NEC	3,454	23.5	11.5	140	24.0	0.5
Sedatives/Hypnotics	593	4.0	2.0	42	7.2	0.1
Solids/Liquids NEC	533	3.6	1.8	93	16.0	0.3
Barbiturates	121	0.8	0.4	14	2.4	0.0
Corrosives/Caustic agents	81	0.6	0.3	3	0.5	0.0
Exhaust gases/Carbon monoxide NEC	55	0.4	0.2	101	17.3	0.3
Agricultural agents	52	0.4	0.2	1	0.2	<0.1
Gases/Vapors NEC	12	0.1	<0.1	1	0.2	<0.1
Gases in Containers	5	<0.1	<0.1	0	-	-
Arsenic	4	<0.1	<0.1	0	-	-
Piped Gases	1	<0.1	<0.1	0	-	-
Utility Gases NEC	1	<0.1	<0.1	0	-	-
Unknown	0	-	-	0	-	-
Total	**14,722**	**100.0**	**49.0**	**583**	**100.0**	**1.9**

[1] Rates per 100,000 persons.

[2] Other race includes Asian/Pacific Islander, Native American, and those noted as being of an Other (unspecified) race.

Table A2. Selected Gender, Race, and Age Group Combinations of Poison-Related Attempted and Completed Suicide, Virginia 2003-2006

	Suicide Attempts			Completed Suicide		
White females	**#**	**%**	**Rate[1]**	**#**	**%**	**Rate**
5-9	1	<0.1	0.2	0	-	-
10-14	206	2.9	29.4	0	-	-
15-19	873	12.1	123.1	5	1.9	0.7
20-24	755	10.5	105.5	8	3.1	1.1
25-34	1,480	20.6	102.6	36	13.9	2.5
35-44	1,911	26.6	110.5	72	27.8	4.2
45-54	1,296	18.0	75.8	75	29.0	4.4
55-64	468	6.5	35.9	38	14.7	2.9
65-74	132	1.8	16.8	12	4.6	1.5
75 and older	75	1.0	9.0	13	5.0	1.6
Total	**7,197**	**100.0**	**63.8**	**259**	**100.0**	**2.3**
White males						
5-9	2	0.1	0.3	0	-	-
10-14	34	0.9	4.6	1	0.4	0.1
15-19	416	10.5	54.6	6	2.2	0.8
20-24	495	12.5	60.8	14	5.1	1.7
25-34	940	23.7	62.5	49	17.7	3.3
35-44	1,022	25.8	58.6	71	25.6	4.1
45-54	714	18.0	42.9	80	28.9	4.8
55-64	218	5.5	17.5	32	11.6	2.6
65-74	74	1.9	10.7	11	4.0	1.6
75 and older	53	1.3	10.7	13	4.7	2.6
Total	**3,968**	**100.0**	**35.8**	**277**	**100.0**	**2.5**
Black females						
5-9	0	-	-	0	-	-
10-14	53	3.6	20.9	0	-	-
15-19	202	13.9	80.2	0	-	-
20-24	207	14.2	85.8	0	-	-
25-34	376	25.9	87.2	3	17.6	0.7
35-44	367	25.3	72.7	5	29.4	1.0
45-54	197	13.6	43.9	8	47.1	1.8
55-64	39	2.7	14.6	1	5.9	0.4
65-74	10	0.7	5.9	0	-	-
75 and older	2	0.1	1.3	0	-	-
Total	**1,453**	**100.0**	**45.6**	**17**	**100.0**	**0.5**
Black males						
5-9	3	0.3	1.3	0	-	-
10-14	11	1.2	4.2	0	-	-
15-19	80	8.6	30.7	0	-	-
20-24	132	14.2	50.6	1	4.8	0.4
25-34	261	28.1	63.5	9	42.9	2.2
35-44	274	29.5	61.0	5	23.8	1.1
45-54	126	13.6	32.0	2	9.5	0.5
55-64	31	3.3	13.9	2	9.5	0.9
65-74	6	0.6	4.8	1	4.8	0.8
75 and older	5	0.5	6.1	1	4.8	1.2
Total	**929**	**100.0**	**31.6**	**21**	**100.0**	**0.7**

[1] Rates per 100,000 persons.

Table A3. Selected Geographic Groupings of Residence of Poison-Related Attempted and Completed Suicides, Virginia 2003-2006

	Suicide Attempts			Completed Suicide		
Medical Examiner District	**#**	**%**	**Rate[1]**	**#**	**%**	**Rate**
Western	4,430	30.1	70.1	161	27.6	2.5
Central	4,417	30.0	55.3	160	27.4	2.0
Northern	3,693	25.1	39.1	166	28.5	1.8
Tidewater	2,181	14.8	34.5	95	16.3	1.5
Unknown	1	<0.1	-	1	0.2	-
Health Planning Region						
Southwestern	3,591	24.4	68.4	131	22.5	2.5
Central	3,242	22.0	63.4	94	16.1	1.8
Northern	3,023	20.5	37.8	124	21.3	1.6
Eastern	2,446	16.6	34.2	109	18.7	1.5
Northwestern	2,419	16.4	53.2	124	21.3	2.7
Unknown	0	-	-	1	0.2	-
Planning District[2]						
Northern Virginia Regional	3,025	20.5	37.8	124	21.3	1.6
Richmond Regional	2,310	15.7	62.6	77	13.2	2.1
Hampton Roads	2,177	14.8	33.2	103	17.7	1.6
Central Shenandoah	839	5.7	78.5	30	5.1	2.8
West Piedmont	679	4.6	68.2	23	3.9	2.3
Roanoke Valley-Alleghany Regional	660	4.5	52.3	33	5.7	2.6
Crater	629	4.3	34.5	37	6.3	2.0
LENOWISCO	513	3.5	138.9	14	2.4	3.8
Thomas Jefferson	500	3.4	58.2	21	3.6	2.4
New River Valley	469	3.2	70.6	13	2.2	2.0
Mount Rogers	464	3.2	61.2	21	3.6	2.8
Region 2000	443	3.0	47.1	22	3.8	2.3
George Washington Regional	406	2.8	34.4	31	5.3	2.6
Northern Shenandoah Valley Regional	385	2.6	47.1	23	3.9	2.8
Cumberland Plateau	364	2.5	79.4	8	1.4	1.7
Rappahannock-Rapidan Regional	283	1.9	45.5	19	3.3	3.1
Commonwealth Regional	177	1.2	53.1	3	0.5	0.9
Southside	121	0.8	34.8	7	1.2	2.0
Middle Peninsula	116	0.8	32.6	6	1.0	1.7
Accomack-Northampton	106	0.7	50.3	1	0.2	0.5
Northern Neck	47	0.3	23.1	3	0.5	1.5
Unknown	9	0.1	-	1	0.2	-
Health District						
Fairfax	1,682	11.4	40.5	56	9.6	1.3
Chesterfield	912	6.2	69.1	34	5.8	2.6
Central Shenandoah	839	5.7	78.5	30	5.1	2.8
Henrico	646	4.4	58.1	21	3.6	1.9
Richmond (City)	638	4.3	82.4	13	2.2	1.7
Prince William	637	4.3	40.8	28	4.8	1.8
Virginia Beach	553	3.8	31.5	38	6.5	2.2
Crater	531	3.6	87.4	5	0.9	0.8
LENOWISCO	513	3.5	138.9	14	2.4	3.8
Thomas Jefferson	495	3.4	57.6	21	3.6	2.4
New River	478	3.2	72.0	13	2.2	2.0

Table A3, continued

	Suicide Attempts			Completed Suicide		
Health District	**#**	**%**	**Rate**	**#**	**%**	**Rate**
Mount Rogers	464	3.2	61.2	21	3.6	2.8
Central Virginia	430	2.9	45.7	22	3.8	2.3
Rappahannock	415	2.8	35.1	31	5.3	2.6
West Piedmont	403	2.7	71.5	16	2.7	2.8
Lord Fairfax	389	2.6	47.6	23	3.9	2.8
Norfolk (City)	370	2.5	39.3	11	1.9	1.2
Cumberland Plateau	364	2.5	79.4	8	1.4	1.7
Loudoun	350	2.4	35.5	11	1.9	1.1
Alleghany	339	2.3	49.0	20	3.4	2.9
Chesapeake	325	2.2	37.6	20	3.4	2.3
Roanoke (City)	311	2.1	84.2	10	1.7	2.7
Peninsula	304	2.1	23.6	17	2.9	1.3
Pittsylvania/Danville	289	2.0	66.9	7	1.2	1.6
Rappahannock/Rapidan	281	1.9	45.2	19	3.3	3.1
Portsmouth	279	1.9	69.7	4	0.7	1.0
Western Tidewater	212	1.4	38.7	4	0.7	0.7
Chickahominy	211	1.4	38.0	10	1.7	1.8
Arlington	205	1.4	26.6	15	2.6	1.9
Piedmont	183	1.2	46.2	4	0.7	1.0
Three Rivers	163	1.1	29.1	9	1.5	1.6
Alexandria	149	1.0	28.1	14	2.4	2.6
Hampton	134	0.9	23.0	5	0.9	0.9
Southside	121	0.8	34.8	7	1.2	2.0
Eastern Shore	106	0.7	50.3	1	0.2	0.5
Unknown	1	<0.1	-	1	0.2	-
Total	**14,722**	**100.0**	**49.0**	**583**	**100.0**	**1.9**

[1] Rates per 100,000 persons.

[2] Chesterfield County is a member of Planning District 15 and Planning District 19, Gloucester County is a member of Planning District 18 and Planning District 23, Franklin County is a member of Planning District 5 and Planning District 12, and Surry County is a member of Planning District 19 and Planning District 23; victims that lived in these counties are reported in both of their Planning Districts. Nottoway County is not a member of a Planning District; victims that lived in Nottoway County are not reported in the Planning District section. Planning Districts numbers will not sum to the total number of victims nor sum to 100%.

Table A4. Residential Locality of Poison-Related Attempted and Completed Suicides, Virginia 2003-2006

Locality	Suicide Attempts			Completed Suicide		
	#	%	Rate[1]	#	%	Rate
Accomack County	76	0.5	48.4	1	0.2	0.6
Albemarle County	155	1.1	43.2	11	1.9	3.1
Alexandria City	149	1.0	28.1	14	2.4	2.6
Alleghany County	28	0.2	41.9	3	0.5	4.5
Amelia County	32	0.2	66.1	0	-	-
Amherst County	58	0.4	45.2	3	0.5	2.3
Appomattox County	17	0.1	30.5	1	0.2	1.8
Arlington County	205	1.4	26.6	15	2.6	1.9
Augusta County	158	1.1	57.1	10	1.7	3.6
Bath County	4	<0.1	20.3	1	0.2	5.1
Bedford City	0	-	-	1	0.2	4.0
Bedford County	118	0.8	45.7	6	1.0	2.3
Bland County	27	0.2	97.0	0	-	-
Botetourt County	38	0.3	29.8	5	0.9	3.9
Bristol City	2	<0.1	2.9	4	0.7	5.8
Brunswick County	12	0.1	16.6	1	0.2	1.4
Buchanan County	81	0.6	81.0	1	0.2	1.0
Buckingham County	25	0.2	39.1	1	0.2	1.6
Buena Vista City	10	0.1	39.3	0	-	-
Campbell County	66	0.4	31.7	5	0.9	2.4
Caroline County	39	0.3	39.2	0	-	-
Carroll County	52	0.4	44.2	5	0.9	4.2
Charles City County	6	<0.1	21.0	0	-	-
Charlotte County	27	0.2	54.3	0	-	-
Charlottesville City	159	1.1	101.6	2	0.3	1.3
Chesapeake City	325	2.2	37.6	20	3.4	2.3
Chesterfield County	771	5.2	67.3	31	5.3	2.7
Clarke County	16	0.1	28.6	1	0.2	1.8
Colonial Heights City	95	0.6	135.6	1	0.2	1.4
Covington City	51	0.3	205.5	0	-	-
Craig County	7	<0.1	33.9	0	-	-
Culpeper County	87	0.6	52.4	7	1.2	4.2
Cumberland County	12	0.1	32.2	0	-	-
Danville City	177	1.2	95.6	4	0.7	2.2
Dickenson County	73	0.5	112.8	1	0.2	1.5
Dinwiddie County	46	0.3	45.5	1	0.2	1.0
Emporia City	0	-	-	1	0.2	4.4
Essex County	9	0.1	21.6	0	-	-
Fairfax City	78	0.5	88.2	2	0.3	2.3
Fairfax County	1,581	10.7	39.3	54	9.3	1.3
Falls Church City	23	0.2	53.7	0	-	-
Fauquier County	93	0.6	36.4	8	1.4	3.1
Floyd County	30	0.2	51.5	1	0.2	1.7
Fluvanna County	46	0.3	47.7	2	0.3	2.1
Franklin City	24	0.2	70.3	2	0.3	5.9
Franklin County	104	0.7	52.0	3	0.5	1.5
Frederick County	104	0.7	38.3	7	1.2	2.6

Table A4, continued

	Suicide Attempts			Completed Suicide		
Locality	**#**	**%**	**Rate**	**#**	**%**	**Rate**
Fredericksburg City	49	0.3	59.3	2	0.3	2.4
Galax City	60	0.4	225.0	0	-	-
Giles County	63	0.4	92.0	0	-	-
Gloucester County	46	0.3	30.7	4	0.7	2.7
Goochland County	33	0.2	43.2	0	-	-
Grayson County	29	0.2	44.2	0	-	-
Greene County	47	0.3	68.2	1	0.2	1.5
Greensville County	37	0.3	81.9	0	-	-
Halifax County	56	0.4	38.5	1	0.2	0.7
Hampton City	134	0.9	23.0	5	0.9	0.9
Hanover County	150	1.0	38.8	8	1.4	2.1
Harrisonburg City	188	1.3	114.9	2	0.3	1.2
Henrico County	646	4.4	58.1	21	3.6	1.9
Henry County	139	0.9	61.3	9	1.5	4.0
Highland County	0	-	-	0	-	-
Hopewell City	137	0.9	151.9	2	0.3	2.2
Isle of Wight County	39	0.3	29.4	1	0.2	0.8
James City County	95	0.6	42.0	4	0.7	1.8
King and Queen County	17	0.1	62.8	0	-	-
King George County	22	0.1	27.5	2	0.3	2.5
King William County	14	0.1	23.9	1	0.2	1.7
Lancaster County	14	0.1	29.7	0	-	-
Lee County	123	0.8	129.4	3	0.5	3.2
Lexington City	9	0.1	32.7	0	-	-
Loudoun County	350	2.4	35.5	11	1.9	1.1
Louisa County	57	0.4	48.3	3	0.5	2.5
Lunenburg County	13	0.1	24.7	1	0.2	1.9
Lynchburg City	171	1.2	64.6	6	1.0	2.3
Madison County	22	0.1	41.4	0	-	-
Manassas City	77	0.5	51.7	2	0.3	1.3
Manassas Park City	1	<0.1	2.2	3	0.5	6.6
Martinsville City	127	0.9	211.6	3	0.5	5.0
Mathews County	8	0.1	21.7	1	0.2	2.7
Mecklenburg County	53	0.4	40.8	5	0.9	3.8
Middlesex County	17	0.1	40.7	0	-	-
Montgomery County	160	1.1	47.3	6	1.0	1.8
Nelson County	31	0.2	51.6	2	0.3	3.3
New Kent County	22	0.1	34.7	2	0.3	3.2
Newport News City	160	1.1	22.2	10	1.7	1.4
Norfolk City	370	2.5	39.3	11	1.9	1.2
Northampton County	30	0.2	55.8	0	-	-
Northumberland County	8	0.1	15.6	1	0.2	1.9
Norton City	53	0.4	353.8	2	0.3	13.3
Nottoway County	30	0.2	48.1	1	0.2	1.6
Orange County	69	0.5	58.0	3	0.5	2.5
Page County	42	0.3	44.1	2	0.3	2.1
Patrick County	33	0.2	42.9	1	0.2	1.3
Petersburg City	178	1.2	136.0	1	0.2	0.8

Table A4, continued

	Suicide Attempts			Completed Suicide		
Locality	**#**	**%**	**Rate**	**#**	**%**	**Rate**
Pittsylvania County	112	0.8	45.4	3	0.5	1.2
Poquoson City	5	<0.1	10.6	1	0.2	2.1
Portsmouth City	279	1.9	69.7	4	0.7	1.0
Powhatan County	46	0.3	43.9	2	0.3	1.9
Prince Edward County	44	0.3	54.0	1	0.2	1.2
Prince George County	100	0.7	70.7	0	-	-
Prince William County	559	3.8	40.9	23	3.9	1.7
Pulaski County	185	1.3	131.8	5	0.9	3.6
Radford City	40	0.3	67.9	1	0.2	1.7
Rappahannock County	10	0.1	34.8	1	0.2	3.5
Richmond City	638	4.3	82.4	13	2.2	1.7
Richmond County	3	<0.1	8.3	0	-	-
Roanoke City	311	2.1	84.2	10	1.7	2.7
Roanoke County	140	1.0	39.6	10	1.7	2.8
Rockbridge County	21	0.1	24.8	2	0.3	2.4
Rockingham County	138	0.9	48.7	3	0.5	1.1
Russell County	108	0.7	93.5	2	0.3	1.7
Salem City	75	0.5	76.2	2	0.3	2.0
Scott County	10	0.1	10.9	0	-	-
Shenandoah County	54	0.4	35.0	8	1.4	5.2
Smyth County	70	0.5	53.7	3	0.5	2.3
Southampton County	27	0.2	38.3	1	0.2	1.4
Spotsylvania County	145	1.0	31.8	20	3.4	4.4
Stafford County	165	1.1	35.6	7	1.2	1.5
Staunton City	141	1.0	149.4	5	0.9	5.3
Suffolk City	122	0.8	39.3	0	-	-
Surry County	14	0.1	49.8	0	-	-
Sussex County	19	0.1	39.4	0	-	-
Tazewell County	102	0.7	57.1	4	0.7	2.2
Virginia Beach City	553	3.8	31.5	38	6.5	2.2
Warren County	118	0.8	84.3	3	0.5	2.1
Washington County	113	0.8	54.5	5	0.9	2.4
Waynesboro City	170	1.2	202.7	7	1.2	8.3
Westmoreland County	22	0.1	32.2	2	0.3	2.9
Williamsburg City	7	<0.1	15.0	1	0.2	2.1
Winchester City	55	0.4	55.2	2	0.3	2.0
Wise County	327	2.2	195.3	9	1.5	5.4
Wythe County	111	0.8	98.2	4	0.7	3.5
York County	37	0.3	15.1	1	0.2	0.4
Unknown	1	<0.1	-	1	0.2	-
Total	**14,722**	**100.0**	**49.0**	**583**	**100.0**	**1.9**

[1] Rates per 100,000 persons.

Table A5. Poisons Used in Poison-Related Completed Suicides, Virginia 2003-2006 (*N*=583)[1]

Poison	# of uses	% of victims
Carbon Monoxide	101	17.3
Alcohol	66	11.3
Diphenhydramine	59	10.1
Oxycodone	58	9.9
Amitriptyline/Nortriptyline[2]	55	9.4
Citalopram	55	9.4
Methadone	54	9.3
Acetaminophen	53	9.1
Hydrocodone Bitartrate	43	7.4
Alprazolam	41	7.0
Morphine Sulfate	36	6.2
Quetiapine	36	6.2
Propoxyphene	31	5.3
Cocaine	29	5.0
Diazepam	29	5.0
Ethylene Glycol	25	4.3
Fluoxetine	25	4.3
Bupropion	23	3.9
Tramadol	23	3.9
Zolpidem	21	3.6
Venlafaxine Hydrochloride	19	3.3
Codeine	17	2.9
Sertraline	17	2.9
Triazolam	17	2.9
Olanzapine	16	2.7
Fentanyl	15	2.6
Promethazine	15	2.6
Cyclobenzapine	13	2.2
Doxepin	13	2.2
Hydromorphone	13	2.2
Paroxetine	12	2.1
Butalbital	11	1.9
Unknown	10	1.7
Carisoprodol	9	1.5
Mirtazapine	8	1.4
Salicylate	8	1.4
Chlorpheniramine	7	1.2
Doxylamine Succinate	7	1.2
Clonazepam	6	1.0
Dextromethorphan	6	1.0
Temazepam	6	1.0
Valporic Acid	6	1.0
Carbamazepine	5	0.9
Clozapine	5	0.9
Humulin	5	0.9
Meperidine	5	0.9
Meprobamate	5	0.9
Acetaminophen with codeine	4	0.7

Table A5, continued

Poison	# of uses	% of victims
Lamotrigine	4	0.7
Oxymorphone	4	0.7
Verapamil	4	0.7
Benzodiazepine, unspecified	3	0.5
Flurazepam	3	0.5
Fluvoxamine	3	0.5
Ibuprofen	3	0.5
Lorazepam	3	0.5
Pentazocine	3	0.5
Amphetamine, unspecified	2	0.3
Caffeine	2	0.3
Chlorpromazine	2	0.3
Colchicine	2	0.3
Cyanide	2	0.3
Diacetylmorhpine	2	0.3
Diltiazem Hydrochloride	2	0.3
Lithium	2	0.3
Metaxalone	2	0.3
Methanol	2	0.3
Metoclopramide	2	0.3
Phenobarbital Sodium	2	0.3
Potassium Chloride	2	0.3
Zeleplon	2	0.3
Acetysalicylate	1	0.2
Aluminum Phosphide	1	0.2
Amozapine	1	0.2
Antidepressant, unspecified	1	0.2
Benztropine	1	0.2
Blood pressure medications, unspecified	1	0.2
Buspirone	1	0.2
Butabarbital	1	0.2
Desipramine	1	0.2
Diazinon	1	0.2
Divalproex Sodium	1	0.2
Drano	1	0.2
Flecainide	1	0.2
Freon	1	0.2
Glycol	1	0.2
Hydroxyzine	1	0.2
Imipramine	1	0.2
Meclizine	1	0.2
Metformin Hydrochloride	1	0.2
Methamphetamine	1	0.2
Methylphenidate	1	0.2
Metoprolol	1	0.2
Naproxen	1	0.2
Nefazodone	1	0.2
Opiate, unspecified	1	0.2
Pentoxifylline	1	0.2

Table A5, continued

Poison	# of uses	% of victims
Phencyclidine	1	0.2
Phenmetrazine	1	0.2
Phentermine Hydrochloride	1	0.2
Refecoxib	1	0.2
Risperidone	1	0.2
Topiramate	1	0.2
Tranylcypromine	1	0.2
Zopiclone	1	0.2

[1] More than one poison type may be used for each victim. Numbers will not sum to the total number of suicide victims and percentages will not sum to 100%. For example, 64 suicides victims ingested prescription and OTC medications.

[2] Nortriptyline appears in two forms: as an independent prescription medication and as a metabolite of the prescription medication Amitriptyline. These two forms are combined in this report, as it is not always clear if Nortriptyline was present as an independent medication or as a metabolite.

Table A6. Detailed Description of Most Common Poisons in Poison-Related Completed Suicides, Virginia 2003-2006[1,2]

Poison	Therapeutic Effect	Class	Common Brand(s)
Carbon monoxide	Not a medication	Other	-
Alcohol	Not a medication	Alcohol	-
Diphenhydramine	Antihistamine	Antihistamine	Benadryl
Oxycodone	Pain management	Opiate	OxyContin
Amitriptyline/Nortriptyline[3]	Management of depression and/or anxiety	Antidepressant	Elavil/Pamelor
Citalopram	Management of depression and/or anxiety	Antidepressant	Celexa, Lexapro
Methadone	Pain management	Opiate	Dolophine, Methadose
Acetaminophen	Pain management	Analgesic	Tylenol
Hydrocodone	Pain management	Opiate	Vicodin
Alprazolam	Management of anxiety and/or a sleep aid	Anti-Anxiety	Xanax
Morphine	Pain management	Opiate	MS Contin
Quetiapine	Treatment of severe mental disorders	Antipsychotic	Seroquel
Propoxyphene	Pain management	Opiate	Darvocet
Cocaine	Not a medication	Stimulant	-
Diazepam	Management of anxiety and/or a sleep aid	Anti-Anxiety	Valium
Ethylene glycol[4]	Not a medication	Other	-
Fluoxetine	Management of depression and/or anxiety	Antidepressant	Prozac
Bupropion	Management of depression and/or anxiety[5]	Antidepressant	Wellbutrin
Tramadol	Pain management	Opiate	Ultram
Zolpidem	Management of anxiety and/or a sleep aid	Sedative/Hypnotic	Ambien

[1] Includes all poisons used to complete 20 or more suicides.

[2] More than one poison may be used for each victim. For example, 13 suicide victims used alcohol and Diphenhydramine.

[3] Nortriptyline appears in two forms: as an independent prescription medication and as a metabolite of the prescription medication Amitriptyline. These two forms are combined in this report, as it is not always clear if Nortriptyline was present as an independent medication or as a metabolite.

[4] Includes Ethylene glycol, glycol, and methanol.

[5] An emerging use of Bupropion is as a smoking-cessation aid.

Table A7. Virginia Localities by Health Planning Region, Health District, and Planning District

Locality	Health Planning Region	Health District	Planning District[1]
Accomack County	Eastern	Eastern Shore	Accomack - Northampton
Albemarle County	Northwest	Thomas Jefferson	Thomas Jefferson
Alexandria City	Northern	Alexandria	Northern Virginia Regional
Alleghany County	Southwest	Alleghany	Roanoke Valley - Alleghany Regional
Amelia County	Central	Piedmont	Commonwealth Regional
Amherst County	Southwest	Central Virginia	Region 2000
Appomattox County	Southwest	Central Virginia	Region 2000
Arlington County	Northern	Arlington	Northern Virginia Regional
Augusta County	Northwest	Central Shenandoah	Central Shenandoah
Bath County	Northwest	Central Shenandoah	Central Shenandoah
Bedford City	Southwest	Central Virginia	Region 2000
Bedford County	Southwest	Central Virginia	Region 2000
Bland County	Southwest	Mount Rogers	Mount Rogers
Botetourt County	Southwest	Alleghany	Roanoke Valley - Alleghany Regional
Bristol City	Southwest	Mount Rogers	Mount Rogers
Brunswick County	Central	Southside	Southside
Buchanan County	Southwest	Cumberland Plateau	Cumberland Plateau
Buckingham County	Central	Piedmont	Commonwealth Regional
Buena Vista City	Northwest	Central Shenandoah	Central Shenandoah
Campbell County	Southwest	Central Virginia	Region 2000
Caroline County	Northwest	Rappahannock	George Washington Regional
Carroll County	Southwest	Mount Rogers	Mount Rogers
Charles City County	Central	Chickahominy	Richmond Regional
Charlotte County	Central	Piedmont	Commonwealth Regional
Charlottesville City	Northwest	Thomas Jefferson	Thomas Jefferson
Chesapeake City	Eastern	Chesapeake	Hampton Roads
Chesterfield County	Central	Chesterfield	Richmond Regional; Crater
Clarke County	Northwest	Lord Fairfax	Northern Shenandoah Valley Regional
Colonial Heights City	Central	Chesterfield	Crater
Covington City	Southwest	Alleghany	Roanoke Valley - Alleghany Regional
Craig County	Southwest	Alleghany	Roanoke Valley - Alleghany Regional
Culpeper County	Northwest	Rappahannock-Rapidan	Rappahannock - Rapidan Regional
Cumberland County	Central	Piedmont	Commonwealth Regional
Danville City	Southwest	Pittsylvania-Danville	West Piedmont
Dickenson County	Southwest	Cumberland Plateau	Cumberland Plateau
Dinwiddie County	Central	Crater	Crater
Emporia City	Central	Crater	Crater
Essex County	Eastern	Three Rivers	Middle Peninsula
Fairfax City	Northern	Fairfax	Northern Virginia Regional
Fairfax County	Northern	Fairfax	Northern Virginia Regional
Falls Church City	Northern	Fairfax	Northern Virginia Regional
Fauquier County	Northwest	Rappahannock-Rapidan	Rappahannock - Rapidan Regional
Floyd County	Southwest	New River	New River Valley
Fluvanna County	Northwest	Thomas Jefferson	Thomas Jefferson
Franklin City	Eastern	Western Tidewater	Hampton Roads
Franklin County	Southwest	West Piedmont	Roanoke Valley-Alleghany Regional; West Piedmont
Frederick County	Northwest	Lord Fairfax	Northern Shenandoah Valley Regional
Fredericksburg City	Northwest	Rappahannock	George Washington Regional

Table A7, continued

Locality	Health Planning Region	Health District	Planning District
Galax City	Southwest	Mount Rogers	Mount Rogers
Giles County	Southwest	New River	New River Valley
Gloucester County	Eastern	Three Rivers	Middle Peninsula; Hampton Roads
Goochland County	Central	Chickahominy	Richmond Regional
Grayson County	Southwest	Mount Rogers	Mount Rogers
Greene County	Northwest	Thomas Jefferson	Thomas Jefferson
Greensville County	Central	Crater	Crater
Halifax County	Central	Southside	Southside
Hampton City	Eastern	Hampton	Hampton Roads
Hanover County	Central	Chickahominy	Richmond Regional
Harrisonburg City	Northwest	Central Shenandoah	Central Shenandoah
Henrico County	Central	Henrico	Richmond Regional
Henry County	Southwest	West Piedmont	West Piedmont
Highland County	Northwest	Central Shenandoah	Central Shenandoah
Hopewell City	Central	Crater	Crater
Isle of Wight County	Eastern	Western Tidewater	Hampton Roads
James City County	Eastern	Peninsula	Hampton Roads
King and Queen County	Eastern	Three Rivers	Middle Peninsula
King George County	Northwest	Rappahannock	George Washington Regional
King William County	Eastern	Three Rivers	Middle Peninsula
Lancaster County	Eastern	Three Rivers	Northern Neck
Lee County	Southwest	LENOWISCO	LENOWISCO
Lexington City	Northwest	Central Shenandoah	Central Shenandoah
Loudoun County	Northern	Loudoun	Northern Virginia Regional
Louisa County	Northwest	Thomas Jefferson	Thomas Jefferson
Lunenburg County	Central	Piedmont	Commonwealth Regional
Lynchburg City	Southwest	Central Virginia	Region 2000
Madison County	Northwest	Rappahannock-Rapidan	Rappahannock - Rapidan Regional
Manassas City	Northern	Prince William	Northern Virginia Regional
Manassas Park City	Northern	Prince William	Northern Virginia Regional
Martinsville City	Southwest	West Piedmont	West Piedmont
Mathews County	Eastern	Three Rivers	Middle Peninsula
Mecklenburg County	Central	Southside	Southside
Middlesex County	Eastern	Three Rivers	Middle Peninsula
Montgomery County	Southwest	New River	New River Valley
Nelson County	Northwest	Thomas Jefferson	Thomas Jefferson
New Kent County	Central	Chickahominy	Richmond Regional
Newport News City	Eastern	Peninsula	Hampton Roads
Norfolk City	Eastern	Norfolk	Hampton Roads
Northampton County	Eastern	Eastern Shore	Accomack - Northampton
Northumberland County	Eastern	Three Rivers	Northern Neck
Norton City	Southwest	LENOWISCO	LENOWISCO
Nottoway County	Central	Piedmont	Not a member of a Planning District
Orange County	Northwest	Rappahannock-Rapidan	Rappahannock - Rapidan Regional
Page County	Northwest	Lord Fairfax	Northern Shenandoah Valley Regional
Patrick County	Southwest	West Piedmont	West Piedmont
Petersburg City	Central	Crater	Crater
Pittsylvania County	Southwest	Pittsylvania-Danville	West Piedmont
Poquoson City	Eastern	Peninsula	Hampton Roads

Table A7, continued

Locality	Health Planning Region	Health District	Planning District
Portsmouth City	Eastern	Portsmouth	Hampton Roads
Powhatan County	Central	Chesterfield	Richmond Regional
Prince Edward County	Central	Piedmont	Commonwealth Regional
Prince George County	Central	Crater	Crater
Prince William County	Northern	Prince William	Northern Virginia Regional
Pulaski County	Southwest	New River	New River Valley
Radford City	Southwest	New River	New River Valley
Rappahannock County	Northwest	Rappahannock-Rapidan	Rappahannock - Rapidan Regional
Richmond City	Central	Richmond	Richmond Regional
Richmond County	Eastern	Three Rivers	Northern Neck
Roanoke City	Southwest	Roanoke	Roanoke Valley - Alleghany Regional
Roanoke County	Southwest	Alleghany	Roanoke Valley - Alleghany Regional
Rockbridge County	Northwest	Central Shenandoah	Central Shenandoah
Rockingham County	Northwest	Central Shenandoah	Central Shenandoah
Russell County	Southwest	Cumberland Plateau	Cumberland Plateau
Salem City	Southwest	Alleghany	Roanoke Valley - Alleghany Regional
Scott County	Southwest	LENOWISCO	LENOWISCO
Shenandoah County	Northwest	Lord Fairfax	Northern Shenandoah Valley Regional
Smyth County	Southwest	Mount Rogers	Mount Rogers
Southampton County	Eastern	Western Tidewater	Hampton Roads
Spotsylvania County	Northwest	Rappahannock	George Washington Regional
Stafford County	Northwest	Rappahannock	George Washington Regional
Staunton City	Northwest	Central Shenandoah	Central Shenandoah
Suffolk City	Eastern	Western Tidewater	Hampton Roads
Surry County	Central	Crater	Crater; Hampton Roads
Sussex County	Central	Crater	Crater
Tazewell County	Southwest	Cumberland Plateau	Cumberland Plateau
Virginia Beach City	Eastern	Virginia Beach	Hampton Roads
Warren County	Northwest	Lord Fairfax	Northern Shenandoah Valley Regional
Washington County	Southwest	Mount Rogers	Mount Rogers
Waynesboro City	Northwest	Central Shenandoah	Central Shenandoah
Westmoreland County	Eastern	Three Rivers	Northern Neck
Williamsburg City	Eastern	Peninsula	Hampton Roads
Winchester City	Northwest	Lord Fairfax	Northern Shenandoah Valley Regional
Wise County	Southwest	LENOWISCO	LENOWISCO
Wythe County	Southwest	Mount Rogers	Mount Rogers
York County	Eastern	Peninsula	Hampton Roads

[1] Chesterfield County, Gloucester County, Surry County, and Franklin County are members of two Planning Districts. Nottoway County is not a member of any Planning District.

Appendix B: Methods and Limitations

Methods

Completed Suicide Data

Information about completed suicides for this report was provided by the Virginia Violent Death Reporting System (VVDRS). The VVDRS documents certain types of violent death, including suicide, that originate within Virginia.[13] It compiles information sources from violent death investigations and correlates victims with the circumstances such as financial problems, alcohol abuse, and mental illness, that precipitate, co-occur with, or contribute to the suicide. The VVDRS is the operation and reporting system of the National Violent Death Reporting System (NVDRS) within Virginia, and uses the same methodology, definitions, coding schema, and software application. The NVDRS is a project of the Centers for Disease Control and Prevention.

VVDRS cases are identified through the Office of the Chief Medical Examiner (OCME). The OCME has jurisdiction over all suicides when the death occurred in Virginia. The OCME investigates relevant deaths and assigns cause (disease or injury pattern that led to death, e.g., gunshot wound to head) and manner (circumstances of death related to intentionality, e.g., suicide). It is the OCME that labels a death a suicide, determines that the cause was poison-related, and decides which specific poisons were responsible for the death. All poisons presented in this paper as being used in completed suicides were ruled by the OCME to have caused or contributed to death.

Each Surveillance Coordinator - an individual intensively trained in the concepts, definitions, and coding schema of the NVDRS - reviews deaths reported to the OCME and determines which cases to include. Each relevant death record is reviewed by a Coordinator. The Coordinator ensures that all information sources required by the NVDRS are in the record, requests reports that are not already in the file, and abstracts and manually enters the relevant information into the database.

Core information sources include the Medical Examiner's investigation, the Death Certificate, a law enforcement investigation, and toxicological testing from the Department of Forensic Science. Continuous quality assurance activities maintain data accuracy and consistency among Coordinators. Deaths recorded in the VVDRS are reconciled with deaths reported by the Virginia Division of Health Statistics and the OCME for the purpose of comprehensive case identification.

Suicide Attempt Data

Information on suicide attempts for this report was provided by Virginia Health Information Inc. (VHI).[14] VHI collects patient-level discharge data from non-Federal acute and specialty hospitals in Virginia. Patient-level data include information on a patient's diagnoses; surgeries; number of days in the hospital; charges; and if they went home, were transferred to another hospital, or died. When a hospital admission occurs due to injury in Virginia, External Cause of

[13] Persons who die in Virginia, but were residents of and were injured in another state, are excluded. Virginia residents who were injured and died in another state are excluded.

[14] Virginia Health Information data extracted from Office of Family Health Services Data Mart, 2003-2006.

Injury Codes (e-codes) are recorded to reflect the mechanism (cause) and intent (e.g., accidental, intentional) of injury. Other demographic and hospital information such as race, gender, age, diagnosis, payer status, length of stay, and related charges are also included at the patient-level.

Cause and intent of hospitalizations were identified using ICD-9-CM[15] injury codes and e-codes. ICD-9-CM is the official system of assigning codes to diagnoses and procedures associated with hospital utilization in the United States. When an injury is the result of an external cause (versus an illness or disease) an e-code is used in addition to the ICD-9-CM codes. E-codes explain both the intent and mechanism of injury and are grouped into twenty-four mechanisms (e.g., poisoning) and intents (e.g., self-inflicted). The STIPDA[16] (2005) recommended framework for e-code groupings for presenting morbidity data can be found at http://www.cdc.gov/ncipc/osp/matrix2.htm.

For this report, a poisoning suicide attempt was defined as any hospital discharge with an injury-related ICD-9-CM code in either the primary or secondary diagnosis fields and a self-inflicted poisoning-related e-code. Self-inflicted poisoning e-codes are E950.0 – E952.9.

Throughout the report, injuries defined by the STIPDA e-code framework as "self-inflicted" will be referred to as suicide attempts. While some self-inflicted injuries can occur without the intent of suicide (e.g., self-cutting), all poisoning, self-inflicted e-codes included in this report are considered to be suicide attempts.

Database Comparison

The following decisions were made to make the data sets (VVDRS and VHI) comparable:

- Only Virginia residents were included in the analysis.
- Races were grouped into the categories of White, Black, Other (includes Asian/Pacific Islander, Native American, and those noted as being "Other"), and Unknown.
- Persons age four and under were excluded from analysis. There were two self-inflicted poisonings and zero poison-related suicides among those four and under during the study period. We suspect that the two self-inflicted poisonings may have been misclassified and so they were excluded from analysis.
- The remaining ages were categorized into ten age groups: 5-9, 10-14, 15-19, 20-24, 25-34, 35-44, 45-54, 55-64, 65-74, and 75 and older.
- Method of poisoning categorization differed between VHI and VVDRS. The VHI data system includes information on broad categories of poisons used (e.g., Barbiturates), while VVDRS includes information on the specific poison used (e.g., Acetaminophen) and type of poison (e.g., prescription medication). Poison data from VVDRS was therefore grouped into the same broad categories as VHI data. The exact poison method data from VVDRS are analyzed in the fourth part of this report.
- The VVDRS allows more than one poison to be identified per victim while the VHI hospital database assigns only one type of poison per victim. As a result, VVDRS poison methods may not total 100%, but VHI methods will always total to 100%.

[15] International Classification of Disease, 9th edition, Clinical Modification.
[16] State and Territorial Injury Prevention Directors Association.

Calculations
Data are presented using frequencies, percentages, and crude rates. Throughout this report, rates are calculated per 100,000 persons. For example, the number of completed poison-related suicides in Virginia from 2003-2006 (583) is divided by the cumulative population of Virginia from this time period (30,056,506) and then multiplied by 100,000 to create a rate of 1.9. Stating that the completed poison-suicide rate for Virginia is 1.9 is the equivalent of saying that 1.9 of every 100,000 Virginian's died from a poison-related suicide.

All crude rates were calculated using Virginia population estimates from the National Center for Health Statistics. Percentages and rates based on 20 or fewer cases - presented in the interest of complete reporting - are considered statistically unstable and should be interpreted and used with caution. When rates are based on events of 20 or less, apparent changes may be attributed to the small numerator rather than actual change in injury occurrence.

Limitations
There are limitations to the hospital discharge data used in this report. The VHI hospital database is maintained using data generated from uniform hospital billing forms, which are used to bill payers such as Medicare for hospital services. The Medicare uniform hospital billing form (UB-92 for 2006 and prior) has a dedicated field for recording an external cause of injury code (e-code), but completing this field is not mandatory for hospitals. On average, 85% of injury discharges in Virginia have a valid e-code. As a result, injury hospitalization data are most likely under-reported in Virginia.

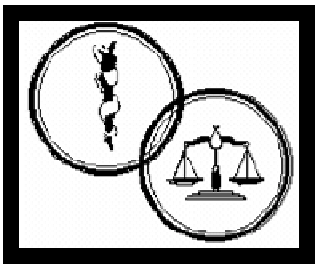
Also, current STIPDA and CDC[17] recommendations call for readmissions, transfers, and deaths in the hospital to be included in final databases. The data do not include Virginia residents who were hospitalized out-of-state, or hospitalizations of non-residents. The data are also not de-duplicated; numbers of hospitalizations represent number of events, not number of individuals hospitalized. Therefore, one person will be counted as a "discharge" for each stay in the hospital, which may result in one person (and their demographic characteristics) being represented multiple times in the database.

For this report, there were a total of 17, 897 hospital discharges from attempted suicide using a poison. Of these, 73 discharges (less than 1.0% of all poison-related suicide attempts) resulted in death. Because the number was so small, and because the VHI data could not be linked to the VVDRS data to exclude these cases, discharges resulting from death were included in the analysis. This means that a small number of persons are represented under both the completed and attempted suicide sections.

Lastly, the VHI hospital database does not contain information on injuries seen only in an outpatient, urgent care, or emergency department setting. Suicide attempts that did not require medical attention were also not included in this report. Therefore, the data presented are not a complete picture of poisoning suicide attempts in Virginia. The number of suicide attempts captured by the VHI hospital database and presented here should be taken as a low estimate of the actual number of suicide attempts.

[17] Centers for Disease Control and Prevention.

Because VVDRS data do not include Virginia residents who died in another state, the calculated rates are also a low estimate of risk among Virginians. It is unclear how many persons fall into this category each year. For example, in 2007 there were at least 65 Virginia residents who died out of state and whose deaths, therefore, were not under the jurisdiction of Virginia's OCME. Of these 65, three were poison-related suicides.



Additional copies of this report are available at the following websites:

http://www.vdh.virginia.gov/medExam/NVDRS.htm

http://www.vahealth.org/Injury/data/index.htm

Commonwealth of Virginia
Virginia Department of Health

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Fatality Review and Surveillance Unit
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Richmond, VA 23219
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Office of Family Health Services
Division of Injury and Violence Prevention
109 Governor Street
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