

Violent Deaths in Kentucky 2005-2010: A Statewide Statistical Summary of Homicides, Suicides and Unintentional Firearm Fatalities

A Partnership between the Kentucky Department for Public Health and the University of Kentucky, College of Public Health, Kentucky Injury Prevention and Research Center

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Project Overview

Recognized by the Centers for Disease Control and Prevention (CDC), violence is a nationwide health problem that results in over 50,000 homicides and suicides each year. In order to better understand why violent deaths occur, the CDC has developed the National Violent Death Reporting System (NVDRS), a nationwide state-based surveillance system designed to track trends and characteristics of violent deaths with the goal of reducing these deaths.¹ The CDC has modeled the NVDRS after the Fatality Analysis Reporting System (FARS), which combines data from fatal traffic crash investigations and has the goal of reducing the rate of motor vehicle-related deaths.²

In anticipation of becoming part of the CDC's NVDRS, and with the financial support of the Kentucky Department for Public Health (KDPH), a statewide Violent Death Reporting System for Kentucky was initiated in January 2002. Kentucky joined the NVDRS September 1, 2005 as one of 17 funded states; 18 states are now funded. All participating states are required to collect information about violent deaths from the following investigating agencies: police departments, coroners, medical examiners, forensic crime laboratories and toxicology laboratories.

In Kentucky, information related to homicides, suicides and firearm-related deaths has, in the past, remained inaccessible, sketchy, scattered and unusable. The coroner system is not centralized, and while police and forensic laboratory data are centralized and available, they are not collected and combined with additional investigative information for violent death research purposes. By integrating multiple data sources in incidents of homicide, suicide and firearm-related fatalities to form the Kentucky Violent Death Reporting System (KVDRS), formerly disparate pieces of information can now be compiled and analyzed.

¹ Additional information on the NVDRS can be found at <http://www.cdc.gov/ncipc/profiles/nvdrs/facts.htm>

² http://www-nrd.nhtsa.dot.gov/departments/nrd-01/summaries/FARS_98.html

To improve coroner reporting *The Coroner Investigation Reporting System (CIRS)* has been designed, developed and distributed to almost 93% of county coroners. This system is the first step in centralizing coroner investigation reports in the Commonwealth and benefits not only the KVDRS, but many other research activities as well. More than half of Kentucky's 120 counties, currently participate in a web-based version of the CIRS.³

In addition to adult data, the KVDRS collects information on child deaths, through the CIRS, and provides data to the division of Adult and Child Health Improvement within the KDPH for the state Child Fatality Review Team process. The goal of the state CFR is to ensure that each potential case of violent death undergoes a full CFR by a multi-disciplinary, multi-agency local CFR team.

Combining previously fragmented investigative pieces into the KVDRS gives a more complete account of violent death in Kentucky. This is critical for surveillance and injury/death prevention efforts.

KVDRS Partners/Data Providers

Information is collected from death certificates, coroner/medical examiner reports, police reports, crime laboratory reports, and toxicology reports, and then combined into the KVDRS database. After all information is stripped of personal identifying information, it is sent to the national database to be combined with information from other funded states. Together, this information provides a more complete picture of violent death in the Commonwealth and our nation. Without these pieces, the problem of violent death cannot be accurately explained or ultimately prevented.

The **Office of Vital Statistics** provides a monthly electronic death certificate file of cases meeting the CDC's definition of a violent death. A case is identified using the International Statistical Classification of Diseases and Related Health Problems: Tenth Revision (ICD-10), and includes homicides, suicides and firearm-related fatalities. More information is then requested of the remaining data providers.⁴

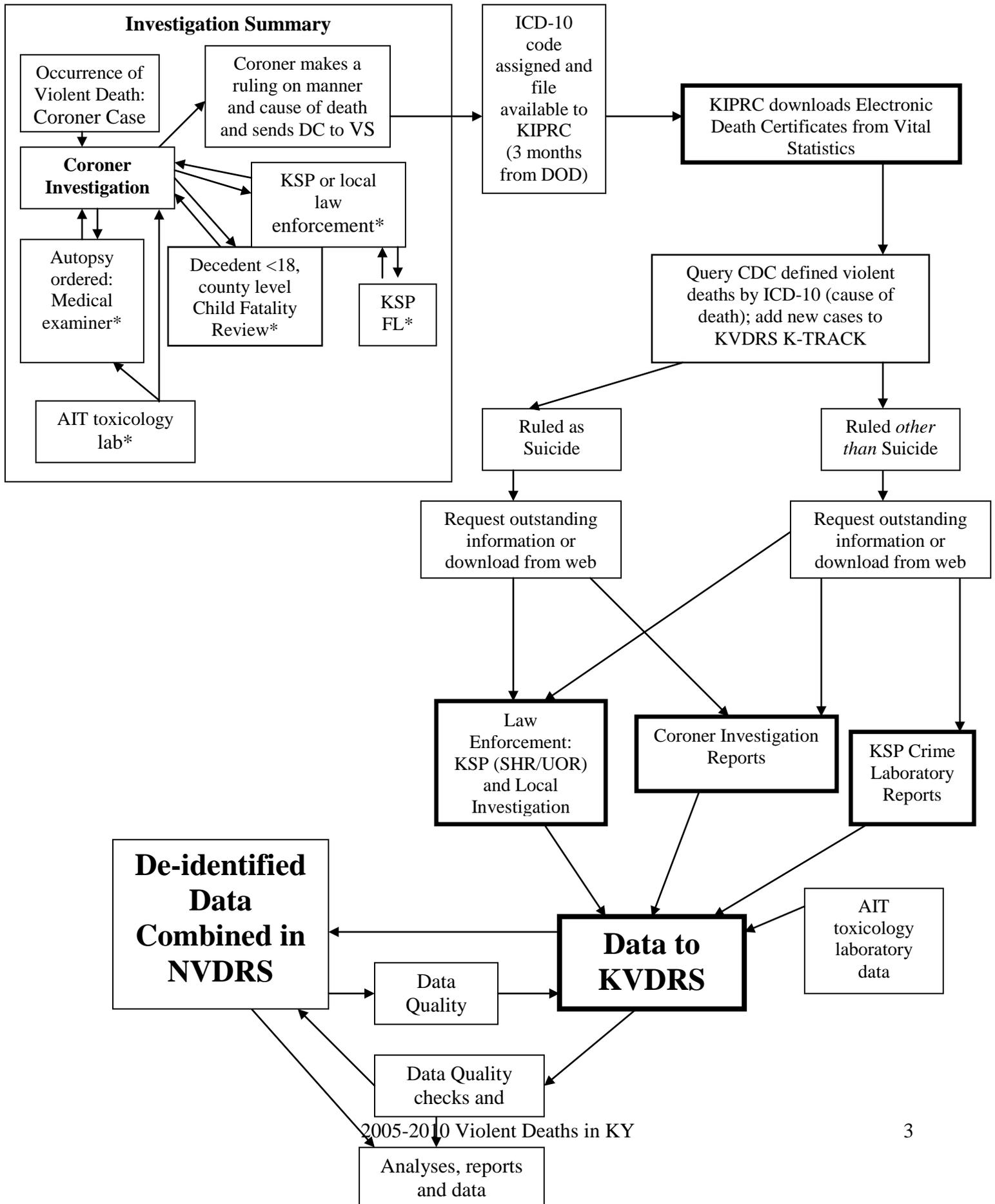
Coroners in Kentucky investigate the cause and manner of all deaths that are defined as coroner's cases by Kentucky Revised Statute 72.405. There are 120 county coroners' offices in the Commonwealth (one in each county).⁵

³ Walsh S, Dignan M, Caldwell G. The PAPM, Diffusion Theory, and Violent Death Surveillance. *Am J Health Behav.* 2007;31(5):451-461.

⁴ <http://chfs.ky.gov/dph/vital/deathcert.htm>

⁵ <http://coroners.ky.gov/>

Figure 1. KVDRS Flow Chart for Data Linkage



The Kentucky **Office of the State Medical Examiner** staff assists Kentucky coroners in all aspects of death investigations, when requested by the coroner, by determining the cause and manner of death and the identity of the deceased. The 13 forensic specialists, including 11 pathologists who perform autopsies, annually conduct nearly 2,500 autopsies at offices located in Louisville, Frankfort, Madisonville and Ft. Thomas.⁶

The American Institute of Toxicology (AIT) laboratories provide statewide toxicology analysis. Autopsy procedures include a blood/urine collection for analysis at AIT. If an autopsy has not been requested, but there is suspicion of drug/alcohol involvement, the coroner performs a blood/urine collection at the scene for analysis at AIT laboratories. AIT laboratories are located in Indianapolis Indiana.⁷

The Kentucky State Police Criminal Identification & Records Branch (KSP) is responsible for receiving, analyzing and maintaining records of traffic accidents, law enforcement activities, criminal cases and statistics, criminal history and identification. The KSP provides information on homicide investigations to the KVDRS. The KSP also provides information on suicides when they are involved in the investigation.⁸

The **Kentucky State Police Forensic Laboratory System (KSPFLS)** is the only forensic laboratory within the Commonwealth of Kentucky. The KSP laboratory system consists of a central laboratory in Frankfort, and five regional laboratories located throughout the state. Evidence collected by Kentucky's law enforcement agencies is submitted to the KSP Central Laboratory or to a regional laboratory located in their community. The KSPFLS provides the KVDRS with weapon information on homicides. Ballistic testing is performed in three labs: The Eastern Regional Laboratory in Ashland, The Jefferson Regional Lab in Louisville and The Central Laboratory in Frankfort.⁹

Kentucky Revised Statute 211.680 was passed by the Kentucky General Assembly in 1996 to create a **Child Fatality Review System** for the purpose of reducing the number of child deaths in Kentucky. This system is designed to learn from the child fatalities and develop strategies to prevent childhood deaths in the future. The local team composition, similar to that of the state team, includes multidisciplinary representation. Members are drawn from the medical, legal and consumer fields along with social and child protection services, law enforcement, mental health counseling and other key community organizations focusing on child safety issues. The KVDRS provides death investigation information on child deaths through the web-based Coroner Investigation Reporting System (CIRS).¹⁰

⁶ <http://www.justice.ky.gov/departments/me/>

⁷ <http://www.aitlabs.com/contact-us.aspx>

⁸ <http://kentuckystatepolice.org/>

⁹ http://www.firearmsid.com/A_labsys.htm

¹⁰ <http://chfs.ky.gov/dph/ach/>

Statistical Measures

The following statistical summary includes incidents in which an individual has died within Kentucky whether he/she is a Kentucky resident or a resident of another state. The incidents reported here represent all violent deaths in Kentucky between 2005 and 2010. The counts of suicides, homicides and unintentional firearm-fatalities in this report will differ from the Office of Vital Statistics and the National Center for Health Statistics who report on Kentucky residents regardless of where he/she died.

Violent deaths are summarized in this report using counts and percentages. Counts and percentages are also used to describe relationships between groups. Of particular interest are comparisons based on gender, race, age and education. Given the small number of deaths occurring in racial groups other than Caucasian or Black, race is divided into two categories: white and non-white. Additionally, age is classified into minor (less than 18 years old) and adult (18 years or older). Education status (high school diploma) is determined for all individuals who are at least 25 years old. Individuals who are less than 25 years old are not included in educational attainment comparisons. Finally, the county where the violent death occurred is labeled as urban or rural according to Beale codes (0-3: urban, 4-9: rural).

In addition to counts and percentages, violent deaths are also described using age-adjusted rates. In order to facilitate the comparison of Kentucky violent death rates to other states, the US 2000 Census is used in the calculation of the age-adjusted rates. SAS® software is used to analyze data for this report.¹¹

Definitions

Homicide: A death resulting from the intentional use of force or power, threatened or actual, against another person, group or community.

Suicide: A death resulting from the intentional use of force against oneself.

Legal Intervention: (in some analysis this category is combined with homicides and is noted in those cases): A death when the decedent was killed by a police officer or other peace officer (persons with specified legal authority to use deadly force), including military police, acting in the line of duty.

Unintentional Firearm: A death resulting from a penetrating injury or gunshot wound from a weapon that uses a powder charge to fire a projectile when there was a preponderance of evidence that the shooting was not intentionally directed at the victim. These cases are also referred to as “accidental deaths” in portions of this report to simplify labeling; accident is the recorded manner of death on Kentucky death certificates.

Undetermined: A death resulting from the use of force against oneself or another person for which the evidence indicating one manner of death is no more compelling than the evidence indicating another manner of death.¹²

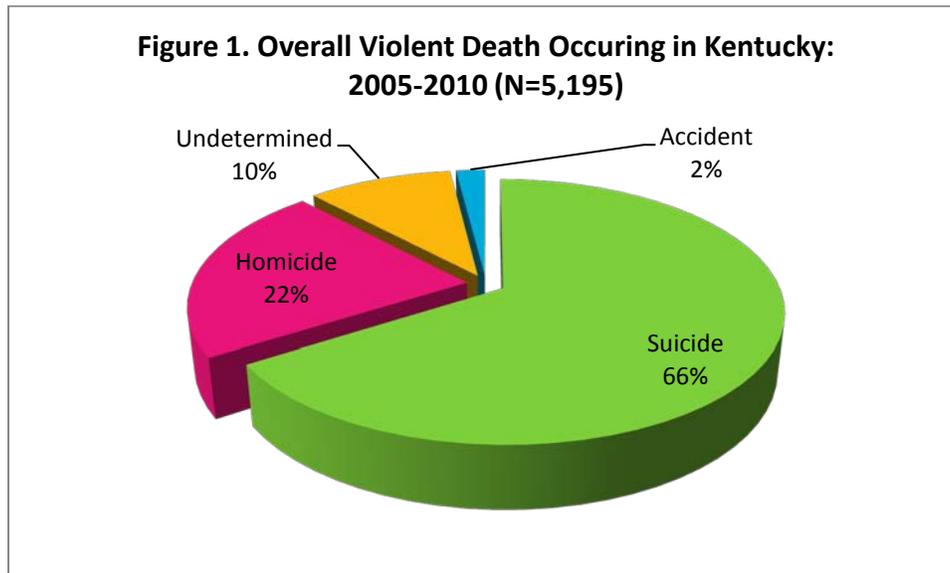
¹¹ SAS software, Version 9.1 of the SAS System. Copyright 2002-2003. SAS Institute Inc. SAS and all other SAS Institute Inc. product or service names are registered trademarks or trademarks of SAS Institute Inc., Cary, NC, USA.

¹² Centers for Disease Control and Prevention, Department of Health and Human Services, National Center for Injury Prevention and Control. NVDRS Coding Manual: Version 2- 2004.

2005-2010 Statistical Summary

KVDRS Population

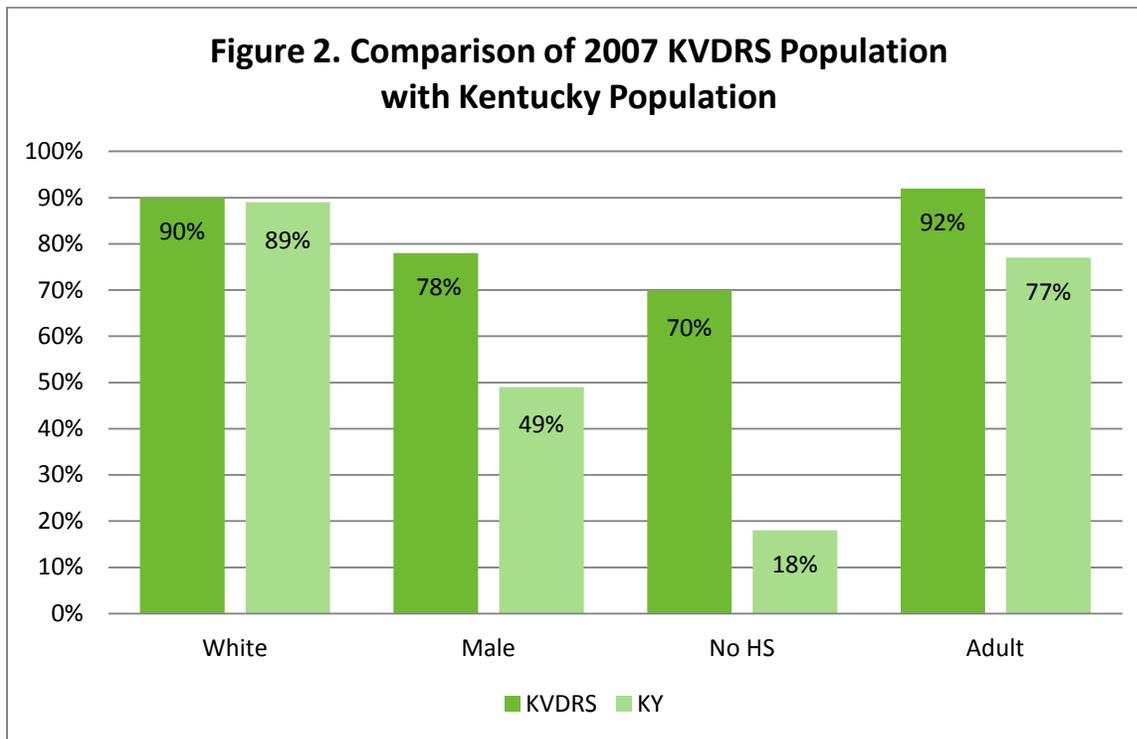
Nearly all (87%) violent death occurring in Kentucky between 2005 and 2010 are classified as suicide or homicide (Figure 2). Suicide is the most common manner (3,413, 66%) of violent death in Kentucky. Homicide* ranks second (1,161, 22%) as cause for violent death, but comprises less than a quarter of the total violent death. The remaining death is attributable to undetermined cause (only 502, 10%) and unintentional firearm death (119, 2%).



KVDRS Population Demographics

The composition of the 2005-2010 KVDRS population is predominantly white (90%), male (78%) and older than 25 years of age (92%). Almost a third of the individuals in the KVDRS population have not obtained a high school diploma. Figure 3 provides a comparison of the 2005-2010 KVDRS population with the results from the 2011 Census. The racial composition of the KVDRS population and the Kentucky population are similar. Gender, on the other hand, has a different distribution in Kentucky versus the KVDRS population (78% v 49% in the KY population). There is a much larger percentage of male fatalities than in Kentucky's population. This indicates that there are more male deaths in the KVDRS population than would be expected from the number of male persons residing in Kentucky. Likewise, there is a much higher percentage of individuals who did not obtain a high school diploma in the violent death population compared to what would be expected from individuals residing in Kentucky (70% v 18%). The overall violent death population is also older than the state population (92% 18 and older v 77%).

*Homicide includes cases of legal intervention (police involvement)



Manner of Death

Table 1 provides a summary of groups of interest in terms of manner of death. Suicide and homicide comprise the majority of violent death regardless of gender, age, race or education. Interestingly, however, nonwhite individuals have the highest homicide rate. In fact, whereas suicide comprises the largest proportion of violent death in all other groups, violent death due to homicide accounts for 67% of violent death in nonwhite persons.

As seen in Figure 2, there are significantly fewer females in the 2005-2010 KVDRS population than would be expected given the gender distribution in Kentucky. Like gender, the ratio of individuals without a high school diploma within the KVDRS population is much higher than expected given Kentucky's population. Over 70% of the individuals 25 years and older in the KVDRS population did not obtain a high school diploma/GED. Of those persons 25 years and older who did not have a high school diploma, there is slightly more homicide compared to those who obtained at least a high school diploma (21% versus 15%). Of the minors in the 2005-2010 KVDRS population, over half (55%) committed suicide. More than double the unintentional firearm deaths were minors. Surprisingly, the distribution of manner of death is similar for both urban and rural areas.

Table 1. 2005 - 2010 Manner of Death								
	Gender				Age			
	Male		Female		Minor		Adult	
	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent
Total	4052		1143		417		4735	
Accident	95	2.3%	24	2.1%	18	4.3%	100	2.1%
Suicide	2782	68.7%	631	55.2%	228	54.7%	3165	66.8%
Homicide	847	20.9%	285	24.9%	118	28.3%	1000	21.1%
Undetermined	300	7.4%	202	17.7%	51	12.2%	443	9.4%
Legal Intervention	28	0.7%	1	0.1%	2	0.5%	27	0.6%

Table 1. 2005 - 2010 Manner of Death											
Race				Education				Urban/Rural			
Non White		White		No HS		HS		Rural		Urban	
Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent
524		4671		2812		1179		1744		3104	
4	0.8%	114	2.4%	62	2.2%	18	1.5%	57	3.3%	43	1.4%
147	28.1%	3266	69.9%	1866	66.4%	873	74.0%	1210	69.4%	2004	64.6%
349	66.6%	784	16.8%	592	21.1%	179	15.2%	366	21.0%	696	22.4%
22	4.2%	480	10.3%	274	9.7%	104	8.8%	99	5.7%	344	11.1%
2	0.4%	27	0.6%	18	0.6%	5	0.4%	12	0.7%	17	0.5%

Suicide

Kentucky's Office of Vital Statistics provides a monthly electronic death certificate file to the KVDRS. A subset is then generated using ICD-10 Codes, meeting the CDC's definition of suicide.

The causes of death, as determined by ICD-10 Codes, are provided in Table 2. The cause of death in most suicides (65%) is attributed to a firearm. Table 2 provides a detailed description of the causes of death for those who committed suicide.

While the majority of suicides involve a firearm, poisoning is a more common cause of suicide in women than in men (34% versus 8%) and hanging is more common in minors versus adults (30% versus 17%) and in nonwhites versus whites (34% versus 18%). There is a higher ratio of

firearm-related suicide deaths in rural areas while hanging, poisoning and other causes of death are more common in urban areas.

Table 2. 2005 - 2010 Cause of Death for Suicide								
	Gender				Age			
	Male		Female		Minor		Adult	
	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent
Total	2797		631		227		3182	
Firearm	1931	69.0%	294	46.6%	124	54.6%	2094	65.8%
Hanging	535	19.1%	88	13.9%	67	29.5%	552	17.3%
Poisoning	221	7.9%	214	33.9%	26	11.5%	401	12.6%
Other	110	3.9%	35	5.5%	10	4.4%	135	4.2%

Table 2. 2005 - 2010 Cause of Death for Suicide											
Race				Education				Urban/Rural			
Non White		White		No HS		HS		Rural		Urban	
Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent
149		3279		1885		886		1225		2003	
70	47.0%	2155	65.7%	1269	67.3%	579	65.3%	942	76.9%	1181	59.0%
50	33.6%	573	17.5%	290	15.4%	150	16.9%	153	12.5%	431	21.5%
14	9.4%	421	12.8%	250	13.3%	113	12.8%	107	8.7%	289	14.4%
15	10.1%	130	4.0%	76	4.0%	44	5.0%	23	1.9%	102	5.1%

Each of Kentucky's 120 county coroner's use a standard set of procedures and adhere to the same protocol during a death investigation, although not all coroners record the investigation in the same manner. Almost all of the 120 counties use a standardized reporting form to document the investigation. The rollout of a statewide coroner web-based reporting system continues with plans to encourage counties to incorporate a web-based system into their death investigations.² Kentucky's Coroner Investigation Report (CIR, and Coroner Investigation Reporting System or CIRS, a web-based matching program) includes a suicide incident section and lists contributing suicide factors; the investigator can check all factors that apply to the incident. There is also a narrative component that allows the investigator to elaborate on the case history. Coroners' reports provide additional information not available through Electronic Death Certificates alone.

Of the 3,143 suicide incidents between 2005-2010, a case history was recorded and collected in 2,313, 68% of all suicide cases.

Women were more than twice as likely to have attempted suicide prior to the completed suicide than men. Women were more likely to be experiencing mental health issues and to be in treatment, though both were, about equally, depressed at the time of the suicide. Women more often left a suicide note, but men more often disclosed their intent to commit suicide to a friend or family member prior to taking their lives. Men more often suffered from a crisis within the two weeks prior to the suicide, were experiencing intimate partner problems and more often suffered from job, financial and criminal/legal problems. Summaries of the circumstances related to suicide between 2005 and 2010 are provided in Table 3.

Table 3. 2005 - 2010 Circumstances for Suicide						
Circumstances	All		Male		Female	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
Total	2313		1869		444	
Current depressed mood	1197	51.8%	941	50.3%	256	57.7%
Current mental health problem	902	39.0%	668	35.7%	234	52.7%
Current treatment for mental illness	798	34.5%	591	31.6%	207	46.6%
Ever treated for mental illness	789	34.1%	583	31.2%	206	46.4%
Intimate partner problem	610	26.4%	532	28.5%	78	17.6%
Physical health problem	505	21.8%	402	21.5%	103	23.2%
Disclosed intent to commit suicide	456	19.7%	373	20.0%	83	18.7%
Person left a suicide note	448	19.4%	333	17.8%	115	25.9%
Other substance problem	323	14.0%	253	13.5%	70	15.8%
Alcohol problem	316	13.7%	264	14.1%	52	11.7%
Crisis in past two wks	286	12.4%	242	12.9%	44	9.9%
History of suicide attempts	284	12.3%	182	9.7%	102	23.0%
Job problems	207	8.9%	184	9.8%	23	5.2%
Financial problem	207	8.9%	179	9.6%	28	6.3%
Recent criminal legal problem	193	8.3%	174	9.3%	19	4.3%
Other relationship problem	133	5.8%	107	5.7%	26	5.9%
Other death of friend or family	128	5.5%	106	5.7%	22	5.0%
Other legal problems	57	2.5%	52	2.8%	5	1.1%
Suicide of friend or family in past	54	2.3%	42	2.2%	12	2.7%
Other argument, abuse, conflict	47	2.0%	33	1.8%	14	3.2%

Table 3. 2005 - 2010 Circumstances for Suicide						
Circumstances	All		Male		Female	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
Perpetrator of interpersonal violence past month	42	1.8%	39	2.1%	3	0.7%
Precipitated by another crime	25	1.1%	22	1.2%	3	0.7%
Intimate partner violence related	22	1.0%	21	1.1%	1	0.2%
School problem	16	0.7%	13	0.7%	3	0.7%
First other crime in progress	4	0.2%	4	0.2%	0	0.0%
Argument over money/property/drugs	4	0.2%	3	0.2%	1	0.2%
Victim of interpersonal violence past month	4	0.2%	0	0.0%	4	0.9%
Drug involvement	3	0.1%	2	0.1%	1	0.2%
Victim used weapon	3	0.1%	3	0.2%	0	0.0%
Jealousy (lover's triangle)	2	0.1%	2	0.1%	0	0.0%
Victim was a bystander	1	0.0%	0	0.0%	1	0.2%
Justifiable self-defense/law enforcement	1	0.0%	1	0.1%	0	0.0%
Mercy killing	1	0.0%	0	0.0%	1	0.2%

Homicide

Kentucky's Office of Vital Statistics provides a monthly electronic death certificate file to the KVDRS. A subset is then generated using ICD-10 Codes, meeting the CDC's definition of homicide. The causes of death, as determined by ICD-10 Codes, are provided in Table 4. The mechanism of death in most homicides (68%) is attributed to a firearm.

Male and female victims have similar causes of death, although women tend to be victims of hanging/strangulation/suffocation more often than men (13% versus 3%). For white homicide victims, the most common mechanism of death is firearm (63%). The percentage of homicides due to a firearm is even higher for non-whites (79%). The manners of death are similar with respect to education, with more frequent sharp instrument uses in homicides of victims with no high school diploma and more than double the percentage of white versus non-white individuals were killed with a blunt instrument.

Table 4. 2005 - 2010 Cause of Death for Homicide								
	Gender				Age			
	Male		Female		Minor		Adult	
	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent
Total	829		265		111		979	
Firearm	593	71.5%	149	56.2%	55	49.5%	684	69.9%
Sharp instrument	104	12.5%	37	14.0%	8	7.2%	132	13.5%
Blunt instrument	58	7.0%	19	7.2%	15	13.5%	62	6.3%
Hanging	22	2.7%	33	12.5%	10	9.0%	45	4.6%
poisoning	5	0.6%	2	0.8%	1	0.9%	6	0.6%
Personal weapons	15	1.8%	6	2.3%	3	2.7%	18	1.8%
other	32	3.9%	19	7.2%	19	17.1%	32	3.3%

Table 4. 2005 - 2010 Cause of Death for Homicide											
Race				Education				Urban/Rural			
Non White		White		No HS		HS		Rural		Urban	
Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent
343		752		585		172		353		677	
271	79.0%	472	62.8%	394	67.4%	116	67.4%	241	68.3%	465	68.7%
36	10.5%	105	14.0%	84	14.4%	21	12.2%	44	12.5%	87	12.9%
9	2.6%	68	9.0%	40	6.8%	11	6.4%	28	7.9%	45	6.6%
12	3.5%	43	5.7%	28	4.8%	11	6.4%	17	4.8%	37	5.5%
0	0.0%	7	0.9%	6	1.0%	0	0.0%	4	1.1%	3	0.4%
7	2.0%	14	1.9%	13	2.2%	4	2.3%	9	2.5%	12	1.8%
8	2.3%	43	5.7%	20	3.4%	9	5.2%	10	2.8%	28	4.1%

The CIR includes a homicide incident section and lists contributing/precipitating circumstances; the investigator can check all circumstances that apply to the incident. Descriptions of these circumstances are provided in Table 5. There is also a narrative component; the investigator can elaborate on the case history. A case history recorded and collected in 56% of cases. Most homicides resulted from arguments, abuse and conflicts or were precipitated by another crime. Of the female homicides 44% were intimate partner violence related compared to 6% of male homicides; intimate partner problems were noted in 25% of cases of female homicide and 6% males. Drug involvement was a circumstance in 23% of male homicides compared to 11% of female homicides. Males were more likely to be killed over an argument over money, property or drugs than females (10% verses 4%) and a mutual physical fight.

Table 5. 2005 - 2010 Homicide Circumstances

Circumstances	All		Male		Female	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
Total	652		485		167	
Other argument, abuse, conflict	202	31.0%	167	34.4%	35	21.0%
Precipitated by another crime	196	30.1%	155	32.0%	41	24.6%
First other crime in progress	135	20.7%	107	22.1%	28	16.8%
Intimate partner violence related	128	19.6%	55	11.3%	73	43.7%
Drug involvement	127	19.5%	109	22.5%	18	10.8%
Intimate partner problem	73	11.2%	31	6.4%	42	25.1%
Argument over money/property/drugs	57	8.7%	50	10.3%	7	4.2%
Victim used weapon	40	6.1%	39	8.0%	1	0.6%
Jealousy (lover's triangle)	29	4.4%	24	4.9%	5	3.0%
Justifiable self-defense/law enforcement	26	4.0%	25	5.2%	1	0.6%
Brawl (mutual physical fight)	13	2.0%	13	2.7%	0	0.0%
Current mental health problem	8	1.2%	4	0.8%	4	2.4%
Gang related	8	1.2%	7	1.4%	1	0.6%
Other relationship problem	7	1.1%	4	0.8%	3	1.8%
Victim was a bystander	7	1.1%	4	0.8%	3	1.8%
Random violence	7	1.1%	4	0.8%	3	1.8%
Current depressed mood	6	0.9%	3	0.6%	3	1.8%
Ever treated for mental illness	6	0.9%	3	0.6%	3	1.8%
Current treatment for mental illness	5	0.8%	4	0.8%	1	0.6%
Other substance problem	5	0.8%	4	0.8%	1	0.6%
Financial problem	5	0.8%	1	0.2%	4	2.4%

Table 5. 2005 - 2010 Homicide Circumstances						
Circumstances	All		Male		Female	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
Victim was a police officer on duty	5	0.8%	5	1.0%	0	0.0%
Alcohol problem	4	0.6%	3	0.6%	1	0.6%
Mercy killing	4	0.6%	1	0.2%	3	1.8%
Victim of interpersonal violence past month	3	0.5%	0	0.0%	3	1.8%
Recent criminal legal problem	3	0.5%	3	0.6%	0	0.0%
Person left a suicide note	2	0.3%	1	0.2%	1	0.6%
Physical health problem	2	0.3%	1	0.2%	1	0.6%
Other legal problems	2	0.3%	2	0.4%	0	0.0%
Victim was intervener assisting crime victim	2	0.3%	2	0.4%	0	0.0%
Perpetrator of interpersonal violence past month	1	0.2%	1	0.2%	0	0.0%
Disclosed intent to commit suicide	1	0.2%	0	0.0%	1	0.6%
History of suicide attempts	1	0.2%	1	0.2%	0	0.0%

Most homicides (62%) and suicides (78%) occur at a house or apartment, including driveway, porch and yard. In cases of suicide, 78% of the time that location is the decedent's place of residence and in cases of homicide, 62% occur in the decedent's place of residence.

Table 6. 2005 - 2010 Place of Death				
Place of Death	Suicide		Homicide	
	Frequency	Percent	Frequency	Percent
Total	2875		979	
Yes / House, apartment, including driveway, porch, yard	2251	78.3%	602	61.5%
No / other place	476	16.6%	325	33.2%
Unknown	148	5.1%	52	5.3%

Table 7. 2005 - 2010 Location of Injury				
	Suicide		Homicide	
	Frequency	Percent	Frequency	Percent
Total	2875		979	
House, apartment	2251	78.3%	602	61.5%
Street/road, sidewalk, alley	34	1.2%	118	12.1%
Highway, freeway	10	0.3%	9	0.9%
Motor vehicle	104	3.6%	51	5.2%
Bar, nightclub	0	0.0%	9	0.9%
Service station	5	0.2%	5	0.5%
Liquor store	1	0.0%	3	0.3%
Other commercial establishment	11	0.4%	15	1.5%
Industrial or construction areas	19	0.7%	13	1.3%
Office building	14	0.5%	5	0.5%
Parking lot/public parking garage	14	0.5%	22	2.2%
Abandoned house, building, or warehouse	2	0.1%	1	0.1%
Sports or athletic area	3	0.1%	1	0.1%
Elementary school, middle school	0	0.0%	1	0.1%
High school	1	0.0%	2	0.2%
College/University	2	0.1%	0	0.0%
Public transportation or station	3	0.1%	2	0.2%
Synagogue, church, temple	6	0.2%	2	0.2%
Hospital, medical facility or nursing home	16	0.6%	7	0.7%
Supervised residential facility	5	0.2%	3	0.3%
Farm	24	0.8%	4	0.4%
Jail, prison, detention facility	35	1.2%	3	0.3%
Park, playground, public use area	24	0.8%	6	0.6%
Natural area	72	2.5%	21	2.1%
Hotel/motel	38	1.3%	8	0.8%
Railroad tracks	9	0.3%	3	0.3%

Table 7. 2005 - 2010 Location of Injury				
	Suicide		Homicide	
	Frequency	Percent	Frequency	Percent
Other	21	0.7%	10	1.0%
Unknown	148	5.1%	52	5.3%

Firearm-related

The distribution of death related to firearms is provided in Tables 8 -10. Suicide is the most common manner of death where a firearm is involved regardless of gender, age and education. Non-white deaths related to a firearm are more often homicide than suicide. Most of the suicides and homicides involve short guns. Short guns or handguns include pistols (bolt action, derringer, single shot and semi-automatic) and revolvers. Long guns include rifles (automatic, bolt action, lever action, pump action, semi-automatic and single shot), shotguns (combination, automatic, bolt action, double barrel, pump action, semi-automatic and single shot).

Table 8. 2005 - 2010 Firearm		
	Gun Related	
	Frequency	Percent
Total	3147	60.0%
Accident	98	82.4%
Suicide	2225	64.4%
Homicide	744	65.4%
Undetermined	54	10.8%
Legal Intervention	26	89.7%

Table 9. 2005 - 2010 Firearm Type										
	Accident		Suicide		Homicide		Undetermined		Legal Intervention	
	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent
Total	64		1745		564		37		25	
Submachine Gun	0	0.0%	0	0.0%	1	0.2%	0	0.0%	0	0.0%
Handgun, Unknown Type	7	10.9%	265	15.2%	125	22.2%	11	29.7%	2	8.0%
Handgun, Pistol- Derringer	0	0.0%	2	0.1%	0	0.0%	0	0.0%	0	0.0%
Handgun, Pistol- Semi-automatic	8	12.5%	272	15.6%	130	23.0%	6	16.2%	11	44.0%
Handgun, Revolver	8	12.5%	386	22.1%	58	10.3%	4	10.8%	1	4.0%
Rifle, Unknown Type	14	21.9%	136	7.8%	21	3.7%	2	5.4%	0	0.0%
Rifle, Automatic	0	0.0%	6	0.3%	0	0.0%	0	0.0%	0	0.0%
Rifle, Bolt Action	0	0.0%	3	0.2%	0	0.0%	0	0.0%	0	0.0%
Rifle, Lever Action	0	0.0%	2	0.1%	0	0.0%	0	0.0%	0	0.0%
Rifle, Semi-automatic	1	1.6%	3	0.2%	7	1.2%	0	0.0%	0	0.0%
Rifle, Single Shot	0	0.0%	1	0.1%	0	0.0%	0	0.0%	0	0.0%
Rifle-Shotgun Combination	0	0.0%	1	0.1%	0	0.0%	0	0.0%	0	0.0%
Shotgun, Unknown Type	10	15.6%	225	12.9%	45	8.0%	3	8.1%	1	4.0%
Shotgun, Automatic	0	0.0%	2	0.1%	1	0.2%	0	0.0%	0	0.0%
Shotgun, Bolt Action	0	0.0%	1	0.1%	0	0.0%	0	0.0%	0	0.0%
Shotgun, Pump Action	1	1.6%	4	0.2%	1	0.2%	0	0.0%	0	0.0%
Shotgun, Semi-automatic	0	0.0%	2	0.1%	0	0.0%	0	0.0%	0	0.0%
Shotgun, Single Shot	0	0.0%	11	0.6%	3	0.5%	0	0.0%	0	0.0%
Long gun, Unknown type	2	3.1%	13	0.7%	2	0.4%	0	0.0%	0	0.0%
Other	1	1.6%	1	0.1%	1	0.2%	0	0.0%	0	0.0%
Unknown	12	18.8%	409	23.4%	169	30.0%	11	29.7%	10	40.0%

Table 10. 2005 - 2010 Manner of Death for Firearm Victims								
	Gender				Age			
	Male		Female		Minor		Adult	
	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent
Total	2669		476		199		2936	
Accident	83	3.1%	15	3.2%	14	7.0%	84	2.9%
Suicide	1931	72.3%	294	61.8%	124	62.3%	2094	71.3%
Homicide	593	22.2%	149	31.3%	55	27.6%	684	23.3%
Undetermined	37	1.4%	17	3.6%	5	2.5%	49	1.7%
Legal Intervention	25	0.9%	1	0.2%	1	0.5%	25	0.9%

Table 10. 2005 - 2010 Manner of Death for Firearm Victims											
Race				Education				Urban/Rural			
Non White		White		No HS		HS		Rural		Urban	
Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent
349		2796		1758		725		1265		1714	
4	1.1%	93	3.3%	54	3.1%	14	1.9%	53	4.2%	31	1.8%
70	20.1%	2155	77.1%	1269	72.2%	579	79.9%	942	74.5%	1181	68.9%
271	77.7%	472	16.9%	394	22.4%	116	16.0%	241	19.1%	465	27.1%
3	0.9%	51	1.8%	25	1.4%	11	1.5%	18	1.4%	22	1.3%
1	0.3%	25	0.9%	16	0.9%	5	0.7%	11	0.9%	15	0.9%

Child, Youth and Young Adult Fatality

Table 12. 2005 - 2010 Manner of Death by Age Group												
Manner of Death	<1		1-4		5-9		10-14		15-18		19-24	
	Frequency	Percent										
Total	25		24		13		31		162		465	
Accident	1	4.0%	1	4.2%	3	23.1%	5	16.1%	4	2.5%	11	2.4%
Suicide	0	0.0%	0	0.0%	0	0.0%	12	38.7%	97	59.9%	245	52.7%
Homicide	16	64.0%	18	75.0%	8	61.5%	9	29.0%	52	32.1%	173	37.2%
Undetermined	8	32.0%	5	20.8%	2	15.4%	5	16.1%	8	4.9%	35	7.5%
Legal Intervention	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	0.6%	1	0.2%

Table 12. 2005 - 2010 Manner of Death by Age Group											
25-34		35-44		45-54		55-59		60+		Total	
Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent
895		1055		1021		335		961		4987	
12	1.3%	14	1.3%	20	2.0%	3	0.9%	39	4.1%	113	2.3%
544	60.8%	704	66.7%	706	69.1%	249	74.3%	735	76.5%	3292	66.0%
255	28.5%	207	19.6%	169	16.6%	49	14.6%	129	13.4%	1085	21.8%
77	8.6%	118	11.2%	121	11.9%	33	9.9%	57	5.9%	469	9.4%
7	0.8%	12	1.1%	5	0.5%	1	0.3%	1	0.1%	28	0.6%

Suicides

Between 2005 and 2010 there were 62 KVDRS suicide cases (9-17 age group) where precipitating circumstances were known. Table 13 is a list of precipitating suicide circumstances and the frequency distribution by sex. As with adults, males most often disclosed their intent and females more often left suicide notes. For both sexes, mental illnesses stood out as the most frequent circumstance for death by suicide, followed by relationship and school problems. There was a difference of 25% between males and females in regard to previous attempts.

Table 13. 2005 - 2010 Top Ten Suicide Circumstances (9-17 years old)						
Circumstances	All		Male		Female	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
Total	62		42		20	
Current depressed mood	21	33.9%	16	38.1%	5	25.0%
Current mental health problem	20	32.3%	16	38.1%	4	20.0%
Current treatment for mental illness	20	32.3%	16	38.1%	4	20.0%
Ever treated for mental illness	20	32.3%	16	38.1%	4	20.0%
Person left a suicide note	17	27.4%	11	26.2%	6	30.0%
Other relationship problem	16	25.8%	13	31.0%	3	15.0%
School problem	13	21.0%	10	23.8%	3	15.0%
Disclosed intent to commit suicide	12	19.4%	10	23.8%	2	10.0%
Intimate partner problem	11	17.7%	8	19.0%	3	15.0%
Crisis in past two wks	10	16.1%	8	19.0%	2	10.0%
History of suicide attempts	8	12.9%	2	4.8%	6	30.0%
Other substance problem	5	8.1%	2	4.8%	3	15.0%
Other death of friend or family	4	6.5%	1	2.4%	3	15.0%
Other argument, abuse, conflict	4	6.5%	2	4.8%	2	10.0%
Suicide of friend or family in past	3	4.8%	2	4.8%	1	5.0%
Recent criminal legal problem	2	3.2%	1	2.4%	1	5.0%
Precipitated by another crime	1	1.6%	0	0.0%	1	5.0%
Argument over money/property/drugs	1	1.6%	1	2.4%	0	0.0%
Perpetrator of interpersonal violence past month	1	1.6%	1	2.4%	0	0.0%
Victim of interpersonal violence past month	1	1.6%	0	0.0%	1	5.0%

Table 13. 2005 - 2010 Top Ten Suicide Circumstances (9-17 years old)						
Circumstances	All		Male		Female	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
Physical health problem	1	1.6%	1	2.4%	0	0.0%
Financial problem	1	1.6%	1	2.4%	0	0.0%

*More than one circumstance can apply

In youth who died by suicide most were white and the most commonly used mechanism was firearm. Surprisingly, females used a firearm 36% of the time and poisoning 9%. (Table14).

Table 14. 2005 - 2010 Mechanism of Suicide Death (9-17 years old)						
weapon	All		Male		Female	
	Frequency	Percent	White	Non-White	White	Non-White
Total	83		56	5	19	3
Firearm	41	49.4%	32	1	8	0
Hanging	35	42.2%	21	3	8	3
Poisoning	5	6.0%	2	1	2	0
Other	2	2.4%	1	0	1	0

Mental health issues were the leading causes of death in youth aged 18 to 24 (53%). In the young adult age group the second areas of concern for males was intimate partner problems and females previous attempts. The third area that emerged was substance and alcohol problems. AS with adults and youth, females more often left suicide notes while males more often disclosed their intent to commit suicide. Table 15 is a list of precipitating suicide circumstances and the frequency distribution by sex. Firearms were the most common method of suicide in the young adult group.

Table 15. 2005 - 2010 Suicide Circumstances (18-24 years old)						
Circumstances	All		Male		Female	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
Total	177		150		27	
Current depressed mood	94	53.1%	78	52.0%	16	59.3%
Current mental health problem	74	41.8%	60	40.0%	14	51.9%
Current treatment for mental illness	68	38.4%	55	36.7%	13	48.1%
Ever treated for mental illness	68	38.4%	54	36.0%	14	51.9%

Table 15. 2005 - 2010 Suicide Circumstances (18-24 years old)						
Circumstances	All		Male		Female	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
Intimate partner problem	53	29.9%	48	32.0%	5	18.5%
Disclosed intent to commit suicide	38	21.5%	35	23.3%	3	11.1%
Other substance problem	33	18.6%	28	18.7%	5	18.5%
Person left a suicide note	31	17.5%	22	14.7%	9	33.3%
History of suicide attempts	25	14.1%	18	12.0%	7	25.9%
Crisis in past two wks	25	14.1%	24	16.0%	1	3.7%
Alcohol problem	18	10.2%	15	10.0%	3	11.1%
Other relationship problem	18	10.2%	17	11.3%	1	3.7%
Recent criminal legal problem	18	10.2%	17	11.3%	1	3.7%
Job problems	14	7.9%	14	9.3%	0	0.0%
Financial problem	9	5.1%	9	6.0%	0	0.0%
Physical health problem	8	4.5%	5	3.3%	3	11.1%
Suicide of friend or family in past	7	4.0%	7	4.7%	0	0.0%
Other death of friend or family	7	4.0%	6	4.0%	1	3.7%
Other legal problems	4	2.3%	4	2.7%	0	0.0%
Intimate partner violence related	3	1.7%	3	2.0%	0	0.0%
Intimate partner violence related	3	1.7%	3	2.0%	0	0.0%
Drug involvement	2	1.1%	1	0.7%	1	3.7%
Other argument, abuse, conflict	2	1.1%	2	1.3%	0	0.0%
Victim was a bystander	1	0.6%	0	0.0%	1	3.7%
Perpetrator of interpersonal violence past month	1	0.6%	1	0.7%	0	0.0%
School problem	1	0.6%	1	0.7%	0	0.0%

Table 16. 2005 - 2010 Mechanism of Suicide Death (18-24 years old)						
			Male		Female	
	All		White	Non-White	White	Non-White
weapon	Frequency	Percent	Frequency	Frequency	Frequency	Frequency
Total	268		207	23	37	1

Table 16. 2005 - 2010 Mechanism of Suicide Death (18-24 years old)						
			Male		Female	
	All		White	Non-White	White	Non-White
weapon	Frequency	Percent	Frequency	Frequency	Frequency	Frequency
Firearm	150	56.0%	126	10	14	0
Hanging	86	32.1%	64	10	12	0
Poisoning	21	7.8%	8	2	10	1
Other	11	4.1%	9	1	1	0

Homicides

Between 2005 and 2010 9% of homicides, 4% where the circumstances were known were children and youth 0-17. Circumstances were similar between males and females. These results should be interpreted with caution, numbers less than 5 are viewed as unstable epidemiologically.

Table 17: 2005 - 2010 Top Ten Homicide Circumstances (0-17 years old)						
Circumstances	All		Male		Female	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
Total	28		19		9	
Other argument, abuse, conflict	9	32.1%	5	26.3%	4	44.4%
Precipitated by another crime	8	28.6%	5	26.3%	3	33.3%
Intimate partner violence related	5	17.9%	3	15.8%	2	22.2%
Intimate partner violence related	5	17.9%	3	15.8%	2	22.2%
Financial problem	2	7.1%	1	5.3%	1	11.1%
Current mental health problem	1	3.6%	1	5.3%	0	0.0%
Intimate partner problem	1	3.6%	1	5.3%	0	0.0%
Drug involvement	1	3.6%	0	0.0%	1	11.1%
Gang related	1	3.6%	1	5.3%	0	0.0%
Jealousy (lover's triangle)	1	3.6%	0	0.0%	1	11.1%
Justifiable self defense/law enforcement	1	3.6%	1	5.3%	0	0.0%
Victim used weapon	1	3.6%	1	5.3%	0	0.0%

Table 18. 2006 - 2010 Homicide Suspect Information (Age 0-17)						
Suspect	All		Male		Female	
	All	White	Non-White	White	Non-White	
	Frequency	Frequency	Frequency	Frequency	Frequency	
Total	51	22	9	18	2	
Girlfriend or boyfriend	2	0	0	2	0	
Parent	3	1	0	2	0	
Child	16	6	1	8	1	
Sibling	2	0	1	1	0	
Stepparent	1	1	0	0	0	
Stepchild	1	0	0	0	1	
Child of suspect boyfriend/girlfriend	6	2	2	2	0	
Other family member	5	3	1	1	0	
Acquaintance	2	0	2	0	0	
Other person, known to victim	2	2	0	0	0	
Information already provided in Relation 1	1	1	0	0	0	
Relationship unknown	10	6	2	2	0	

Circumstances for young adults resemble youth homicides more than adult homicides. Whereas mental illness represents the top circumstances, for young adults and youth the most common precipitating circumstances are crime, arguments, abuse and conflict. Drug related homicide and intimate partner violence also emerge as important circumstantial information for this age group.

Table 19. 2005 - 2010 Top Ten Homicide Circumstances (18-24 years old)						
Circumstances	All		Male		Female	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
Total	107		92		15	
Precipitated by another crime	34	31.8%	24	26.1%	10	66.7%
Other argument, abuse, conflict	34	31.8%	29	31.5%	5	33.3%
Drug involvement	28	26.2%	24	26.1%	4	26.7%
Argument over money/property/drugs	14	13.1%	13	14.1%	1	6.7%
Intimate partner violence related	9	8.4%	4	4.3%	5	33.3%
Intimate partner violence related	9	8.4%	4	4.3%	5	33.3%

Table 19. 2005 - 2010 Top Ten Homicide Circumstances (18-24 years old)						
Circumstances	All		Male		Female	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
Jealousy (lover's triangle)	8	7.5%	7	7.6%	1	6.7%
Victim used weapon	7	6.5%	6	6.5%	1	6.7%
Intimate partner problem	5	4.7%	3	3.3%	2	13.3%
Justifiable self defense/law enforcement	4	3.7%	3	3.3%	1	6.7%
Gang related	3	2.8%	2	2.2%	1	6.7%
Other relationship problem	2	1.9%	1	1.1%	1	6.7%
Random violence	2	1.9%	1	1.1%	1	6.7%
Current depressed mood	1	0.9%	1	1.1%	0	0.0%
Current mental health problem	1	0.9%	1	1.1%	0	0.0%
Current treatment for mental illness	1	0.9%	1	1.1%	0	0.0%
Ever treated for mental illness	1	0.9%	1	1.1%	0	0.0%
Other substance problem	1	0.9%	0	0.0%	1	6.7%
Victim was a bystander	1	0.9%	0	0.0%	1	6.7%
Financial problem	1	0.9%	0	0.0%	1	6.7%
Other legal problems	1	0.9%	1	1.1%	0	0.0%
Victim was intervener assisting crime victim	1	0.9%	1	1.1%	0	0.0%

Table 16. 2006 - 2010 Homicide Suspect Information (Age 18 - 24)					
Suspect	All	Male		Female	
	All	White	Non-White	White	Non-White
	Frequency	Frequency	Frequency	Frequency	Frequency
Total	78	32	38	5	3
Girlfriend or boyfriend	2	0	0	1	1
Parent	1	1	0	0	0
Child	1	0	0	1	0
Sibling	1	1	0	0	0
Grandparent	1	1	0	0	0
Stepchild	1	0	0	1	0

Table 16. 2006 - 2010 Homicide Suspect Information (Age 18 - 24)

Suspect	All	Male		Female	
	All	White	Non-White	White	Non-White
	Frequency	Frequency	Frequency	Frequency	Frequency
Other family member	3	1	2	0	0
Acquaintance	9	5	2	1	1
Friend	2	1	1	0	0
Roommate	1	1	0	0	0
Current/former work relationship	2	1	1	0	0
Other person, known to victim	3	2	1	0	0
Stranger	9	2	7	0	0
Victim was injured by law enforcement officer	1	1	0	0	0
Information already provided in Relation 1	3	1	2	0	0
Relationship unknown	38	14	22	1	1

Toxicology

Specimens are collected for toxicologic analysis by the medical examiner during autopsy or by the coroner during postmortem examination. Samples are then sent for analysis at American Institute of Toxicology (AIT) laboratories. If an autopsy has not been requested, but there is suspicion of drug/alcohol involvement, the coroner performs a blood/urine collection at the scene for analysis at AIT laboratories. The KVDRS has access to AIT laboratory reports through the Chief Medical Examiner. If no toxicology report is available, no specimen was drawn or analyzed. Toxicology screening includes alcohol and other volatiles, a large number of prescription medications, over-the-counter medications and illicit drugs.

Toxicology results are based on substances found in the victims; suspect toxicology results are not included in this report. If toxicology analysis reveals that there is more than one substance found, there is overlap between substance categories. For instance, if alcohol and cocaine both test positive then those results are added to both categories though reporting on only one decedent.

Tables 17-19 provide the toxicology results with respect to gender, age and manner of death (homicide/suicide). Minors and adults, interestingly, had the same percentage of marijuana and amphetamines present. Women are almost two times more likely to test positive for antidepressants when dying violently than men. While men more often had alcohol in their system at the time of their death, women had opiates. Antidepressants are found more often in suicides than homicides, where cocaine is found 3 times more often in homicides and marijuana

double that in suicides. Homicide and suicide victims had similar ratios of alcohol, opiates and amphetamines.

Table 17. 2005-2010 Toxicology Results: Adult VS Minor		
TOXICOLOGY	Minor Total=199	Adult Total=2,936
	Frequency	Frequency
Alcohol	12 (6%)	980 (33%)
Amphetamine	7 (4%)	116 (4%)
Antidepressant	12 (6%)	581 (20%)
Cocaine	1 (0.5%)	320 (11%)
Marijuana	21 (11%)	336 (11%)
Opiate	10 (5%)	876 (30%)

Table 18. 2005-2010 Toxicology Results: Male VS Female		
TOXICOLOGY	Male Total=4,052	Female Total=1,143
	Frequency	Frequency
Alcohol	827 (20%)	162 (14%)
Amphetamine	99 (2%)	24 (2%)
Antidepressant	378 (9%)	216 (19%)
Cocaine	264 (0.02%)	56 (5%)
Marijuana	305 (8%)	52 (5%)
Opiate	628 (15%)	258 (23%)

Table 19. 2005-2010 Toxicology Results: Suicide VS Homicide		
TOXICOLOGY	Suicide Total=3,413	Homicide Total=1,132
	Frequency	Frequency
Alcohol	649 (19%)	237 (21%)

Table 19. 2005-2010 Toxicology Results: Suicide VS Homicide		
TOXICOLOGY	Suicide Total=3,413	Homicide Total=1,132
	Frequency	Frequency
Amphetamine	68 (2%)	33 (3%)
Antidepressant	438 (13%)	52 (5%)
Cocaine	136 (4%)	137 (12%)
Marijuana	165 (5%)	151 (13%)
Opiate	484 (14%)	180 (16%)