



## TENNESSEE VIOLENT DEATH REPORTING SYSTEM

### Using TNVDRS to Understand Violent Death Among Women of Reproductive Age | 2020

The Tennessee Violent Death Reporting System (TNVDRS) is a data system that pools data on violent deaths and their circumstances from multiple sources, including the death certificate, medical examiner records, and law enforcement records, into a de-identified database maintained by the CDC, who funds our surveillance efforts. TNVDRS collects over 600 unique data elements to provide context on violent deaths occurring in our state including: homicide, suicide, unintentional firearm deaths, legal intervention, and deaths of undetermined intent. Due to the depth of data collected and collaboration with multiple sources, a data year is finalized 16 months of the end of the calendar year. Tennessee joined the National Violent Death Reporting System (NVDRS) in 2018, completing a pilot collection year of 2019 data and our first statewide collection of 2020 data.

Data is abstracted from the records into the NVDRS database by a team of trained abstractors using coding guidance and case definitions developed by the CDC. The full coding manual is available by emailing [TN.VDRS@tn.gov](mailto:TN.VDRS@tn.gov).

The goal of this report is to provide an overview of the data available regarding violent death in the specific population of females of reproductive age, aged 10-54, by request of the Tennessee Department of Health Division of Family Health & Wellness. We have identified 305 individuals meeting this criterion in the 2020 TNVDRS dataset, and we present information regarding incident classification, injury characteristics, decedent demographics, and circumstances specific to the manner of death for these decedents.

Rates and counts for groups less than 10 individuals have been suppressed. Rates are calculated using population information available at <https://www.tn.gov/health/health-program-areas/statistics/health-data/population.html>. Any questions regarding the information below or requests for additional detail should be emailed to [TN.VDRS@tn.gov](mailto:TN.VDRS@tn.gov).

#### I. TNVDRS Incident Classification

Cases are identified for inclusion in the TNVDRS dataset initially based on the manner of death stated on the death certificate (DC). As additional information about the incident is gathered, the abstractor generates a manner of death based on review of all of the reports. The abstractor manner of death must agree with at least *one* of the manners stated in other data sources: either the DC, the medical examiner (CME) reports, or the law enforcement (LE) reports. We use the abstractor manner of death to classify incidents since it represents as comprehensive a review of the data sources that we can produce.

Incidents are further categorized using a variable automatically generated by the NVDRS database using the manner of death information as well as the number of victims in an incident.

**Table 1.** TNVDRS Categorization of Violent Deaths Among Women Aged 10-54, 2020 (n = 305)

	<b>Count</b>	<b>Rate</b>
<b>Abstractor Manner of Death</b>		
Suicide or intentional self-harm	154	7.71
Homicide	110	5.51
Undetermined intent, Unintentional firearm, or Legal intervention	41	2.05
<b>Incident Type</b>		
Single suicide	151	7.56
Single homicide	75	3.75
Multiple homicide	17	0.85
Single homicide followed by suicide	13	0.65
Single death of undetermined intent	38	1.90
All other types*	11	0.55

\*Includes single unintentional firearm death, single legal intervention death, multiple deaths including multiple homicides followed by suicide, homicide followed by legal intervention, and unclassified

Table 1 shows the manners of death and incident types for the 305 decedents identified in our dataset. About fifty percent (50.5%) of the decedents had a manner of death of suicide, followed by 36.1% having a manner of death of homicide and 13.4% in the remaining categories of undetermined intent, unintentional firearm, or legal intervention. About forty-nine percent (49.5%) of the decedents were involved in an incident characterized as a single suicide, 24.6% involved in an incident characterized as a single homicide, 5.6% in a multiple homicide, 4.3% in a homicide followed by a suicide, 12.5% in a single death of undetermined intent, and the remaining 3.6% were involved in incidents of varying types detailed in the footnote at the bottom of Table 1.

## II. Characterizing the Scene of Injury

TNVDRS collects several variables regarding the scene of injury and surrounding environmental circumstances. In this section, we will discuss the injury scene in terms of time, geography, and environment.

There was no observable trend in the time of year during which the incident occurred – the incidents are distributed roughly evenly across the calendar year and there were an average of 24.8 incidents per month in 2020. The majority of decedents (65.9%) died the same day that injury occurred, and an additional 6.2% died the following day. For the 75 decedents with a recorded time of injury, 41 (54.7%) were injured between noon and midnight, and 34 (45.3%) were injured between midnight and noon. The time of injury was unknown for 230 decedents.

**Table 2.** Mortality Rate by County of Injury, 2020 (n = 305)

	<b>Count</b>	<b>Rate</b>
<b>County</b>		
Davidson	37	16.41
Knox	31	21.69
Madison	10	34.74
Montgomery	13	18.99
Rutherford	10	9.02
Shelby	60	20.85
Sumner	10	17.56
Washington	11	29.24
<b>Tennessee</b>	<b>305</b>	<b>15.27</b>

Table 2 shows county-level mortality rates for those counties with sufficient counts; it should be noted that fewer than ten decedents were missing the county of injury variable. Madison County had the highest mortality rate in our dataset at 34.74, although only 3.3% of decedents were injured in this county. Shelby County had the highest percentage of decedent injuries at 19.7%.

Table 3 on the following page shows the characteristics of the specific injury location associated with each incident. The majority of decedents were injured at a house or apartment (67.5%), and for 175 of these, that was their own residence. Twelve percent (12.1%) were injured in a motor vehicle, excluding school buses or public transportation. The remaining categories shown in the first part of Table 3 are aggregated due to small counts; TNVDRS collects detailed information about the type of location where injury occurred for each individual decedent.

A majority of injuries occurred at the decedent's home (58.0%), and most of the decedents were not at work or engaged in work when injury occurred.

The location of death is collected primarily from the death certificate, and consequently, the categories are not as detailed as those for injury location. However, by analyzing the text in the "Other (Specify)" field on the death certificate, we were able to determine some additional death location information. As in previous sections on this table, the largest percentage of decedents died at home (42.6%), and 24.6% died in either an inpatient or ER setting. Based on the text field accompanying death location on the certificate, we also note that 9.2% died either at a roadside location (street, highway, sidewalk, etc.) or in an unspecified motor vehicle, and 7.2% died at an outdoor location (park, woods, lake, etc.).

**Table 3.** Characteristics of the Location of Injury, 2020 (n = 305)

	<b>Count</b>	<b>Rate</b>
<b>Category of Location of Injury</b>		
House, apartment	206	10.31
Motor vehicle (excluding school bus and public transport)	37	1.85
Aggregated roadside*	19	0.95
Aggregated commercial location**	14	0.70
Aggregated outdoor location***	10	0.50
Aggregated other/unknown****	19	0.95
<b>Decedent Injured at Home</b>		
Yes	177	8.86
No	125	6.26
Unknown	*	*
<b>Decedent Injured at Work or While Working</b>		
Yes	*	*
No	298	14.92
Unknown	*	*
<b>Category of Location of Death</b>		
Home	130	6.51
Hospital inpatient	33	1.65
Emergency Department/outpatient	42	2.10
Other residence	14	0.70
Roadside location or in unspecified vehicle	28	1.40
Outdoor location	22	1.10
Other <sup>‡</sup>	36	1.80

\*Includes street, sidewalk, alley, highway, parking lot, and public garage

\*\*Includes hotel/motel, bar/nightclub, service station, and other commercial establishment

\*\*\*Includes farm, park/playground, natural area, and industrial/construction area

\*\*\*\*Includes railroad tracks, cemetery, religious facility, detention facility, supervised residential facility, other (not specified), and unknown

‡ Includes "dead on arrival"

**Table 4.** Injury Circumstances, 2020 (n = 305)

	<b>Count</b>	<b>Rate</b>
<b>Child(ren) Present and/or Witnessed Incident</b>		
Yes	34	1.70
No or Unknown	271	13.57
<b>Alcohol Use by Decedent Suspected*</b>		
Yes	35	1.75
No or Unknown	270	13.52
<b>EMS Present at Scene</b>		
Yes	293	14.67
No	12	0.60
<b>Decedent Seen at Hospital Following Incident</b>		
Seen in ER following incident	61	3.05
Seen in ER and then admitted as inpatient	33	1.65
No or Unknown	211	10.56

\*This variable is based on witness or investigator reports, or circumstantial evidence and does not use toxicology reports.

TNVDRS collects additional variables related to the scene of injury that are best presented in this section, shown in Table 4 above. In 11.1% of incidents, one or more children were present during the incident. This does not necessarily indicate that they observed the event; the variable seeks to identify children who were present, regardless of whether they are described in reports as witnesses.

In 11.5% of incidents, the decedent was suspected of using alcohol in the hours preceding the incident. This variable is collected based on witness or investigator reports, or scene evidence, and does not take toxicology information into account. If a witness stated that the decedent “had been drinking,” or if empty bottles are found near the decedent, this variable is endorsed. Because of the similarity in count between this variable and the previous one, we checked and found that these circumstances do not overlap – there is no statistical relationship between children being present and suspected alcohol use. It is simply coincidence that the counts are close in this particular dataset.

In 96.1% of incidents, emergency medical services (EMS) were at the scene of injury. This simply indicates that they were present and not necessarily that medical services were delivered. Thirty percent (30.8%) of decedents were seen at a hospital following the incident; about a third of these were admitted as an inpatient after being seen in an emergency room (ER).

We also collect information about whether the decedent was in public custody (under arrest, in foster care, or remanded by law to an institution such as a jail, prison, psychiatric ward, etc.) or whether they had been recently released from custody. In the requested population of women between the ages of 10 and 54, there were fewer than ten decedents with these variables endorsed, so the information is not presented in this particular report.

### III. Decedent Demographics

The majority of the standard demographic variables collected by TNVDRS (age, sex, race/ethnicity, pregnancy status, occupation, etc.) come directly from the death certificate and will therefore align with Vital Statistics data.

**Table 5.** Decedent Demographics, 2020 (n = 305)

	Count	Rate
<b>Age At Death</b>		
10 - 19 years	28	6.69
**10 - 17 years	18	
20 - 24 years	35	15.79
25 - 34 years	84	17.43
35 - 44 years	80	18.42
45 - 54 years	78	17.70
<b>Race</b>		
White	216	7.87
Black or African American	78	12.60
Other or Unspecified	11	6.71
<b>Ethnicity</b>		
Not Hispanic	294	*
Hispanic	11	5.70
<b>State of Residence At Death</b>		
Tennessee Resident	286	*
Out-of-State Resident	19	*
<b>Body Mass Index (kg/m<sup>2</sup>) At Autopsy*</b>		
< 18.5	22	1.10
18.5 - 25	114	5.71
25 - 30	63	3.15
> 30	65	3.25
Unknown	41	2.05
<b>Pregnancy Status At Death</b>		
Not pregnant within last year	58	2.90
Pregnant within last year or at time of death	10	0.50
Unknown if pregnant within last year	245	12.27

\*Calculated using height and weight collected at autopsy; may not be accurate representation of physical characteristics prior to death

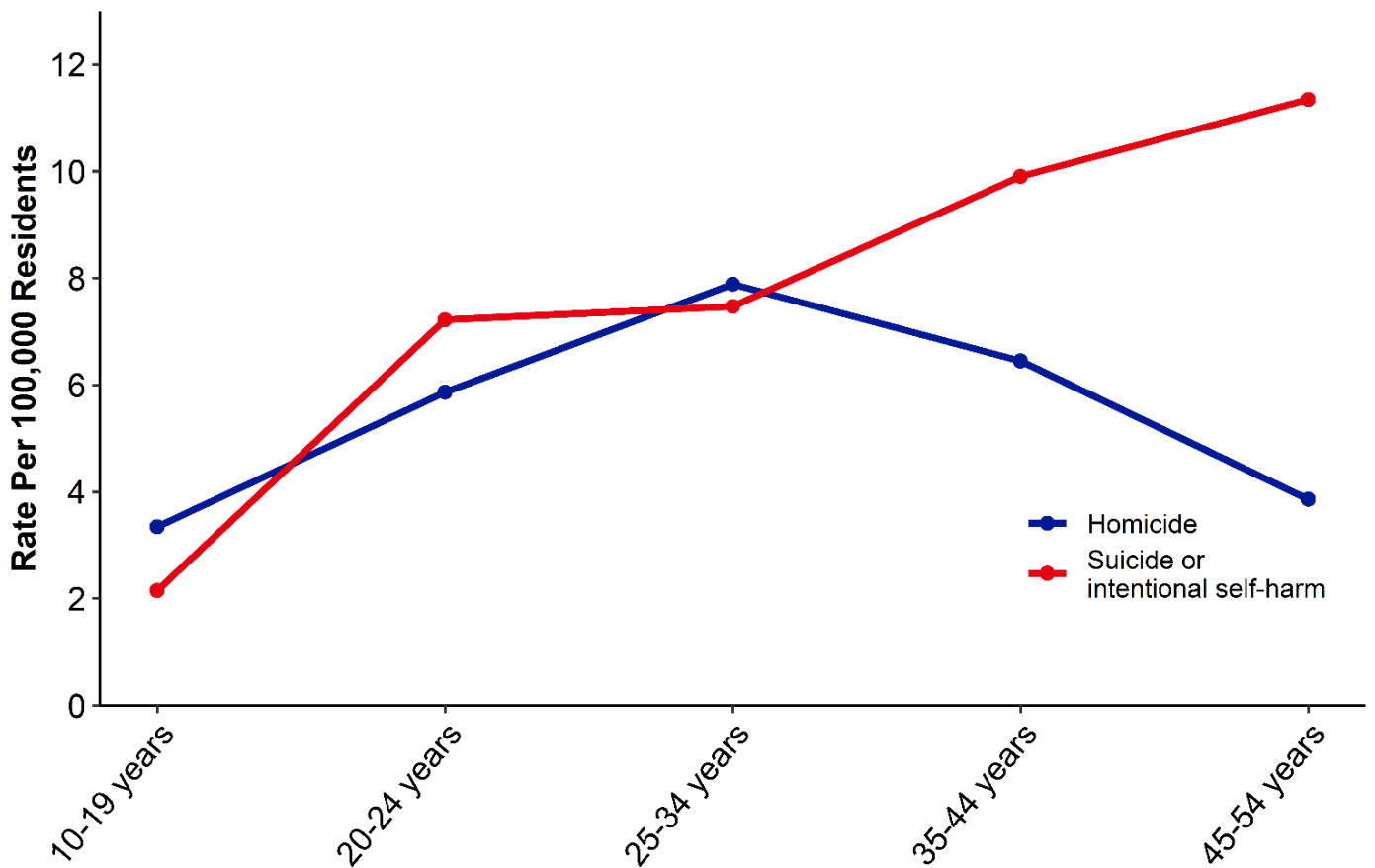
Table 5 shows variables related to age, race/ethnicity, residency, BMI and pregnancy status at death. We also note that TNVDRS collects information regarding the transgender identity of the decedent, but this variable is not well-populated in TN data as of 2020. Fewer than ten decedents in this population are identified as transgender, but this is information that is not generally included in the source documents, so it would be more accurate to state that the reports are not capturing transgender identity information.

In order to calculate rates using available 2020 population data, we break the age ranges as shown, but our usual preference is to group adolescents and young adults separately (ie, 10 to 17 years and 18 to 24 years) because those populations are actually very different environmentally. To this end, we show the count of decedents from 10 to 17 years as well.

Nine percent (9.2%) of the decedents are under the age of 20, with a mortality rate of 6.69. Eleven percent (11.5%) are between the ages of 20 and 24, with a rate of 15.79. Twenty-seven percent (27.5%) are between the ages of 25 and 34, with a rate of 17.43. Twenty-six percent (26.2%) are between the ages of 35 and 44, with a rate of 18.42, and 25.6% are between the ages of 45 and 54 years, with a rate of 17.70.

Because these counts represent multiple manners of death, Figure 1 below shows the age distribution when the data are stratified by abstractor manner of death. We see that the suicide mortality rate is higher than the homicide mortality rate for the majority of age groups (20-24 years, 35-44 years, and 45-54 years), with the gap appearing to increase at higher ages.

**Figure 1.** Mortality Rate by Age by Abstractor Manner of Death, 2020



In general, TNVDRS presents race and ethnicity as a combined variable, but in order to be able to accurately calculate rates based on the available population tables, we show them as separate variables in Table 5. The majority of decedents were White (70.8%), 25.6% of decedents were Black/African American, and the remaining 3.6% of decedents were distributed across racial categories in counts too small to show separately. About three percent (3.6%) of decedents were Hispanic.

Figure 2 below shows the mortality rate age distribution of decedents by race; due to small counts in the other categories, only Black/African American and White decedents are shown in this figure. For all age groups except 45-54 years, the mortality rate among Black/African American decedents is higher than among White decedents.

**Figure 2. Mortality Rate by Age by Race, 2020**

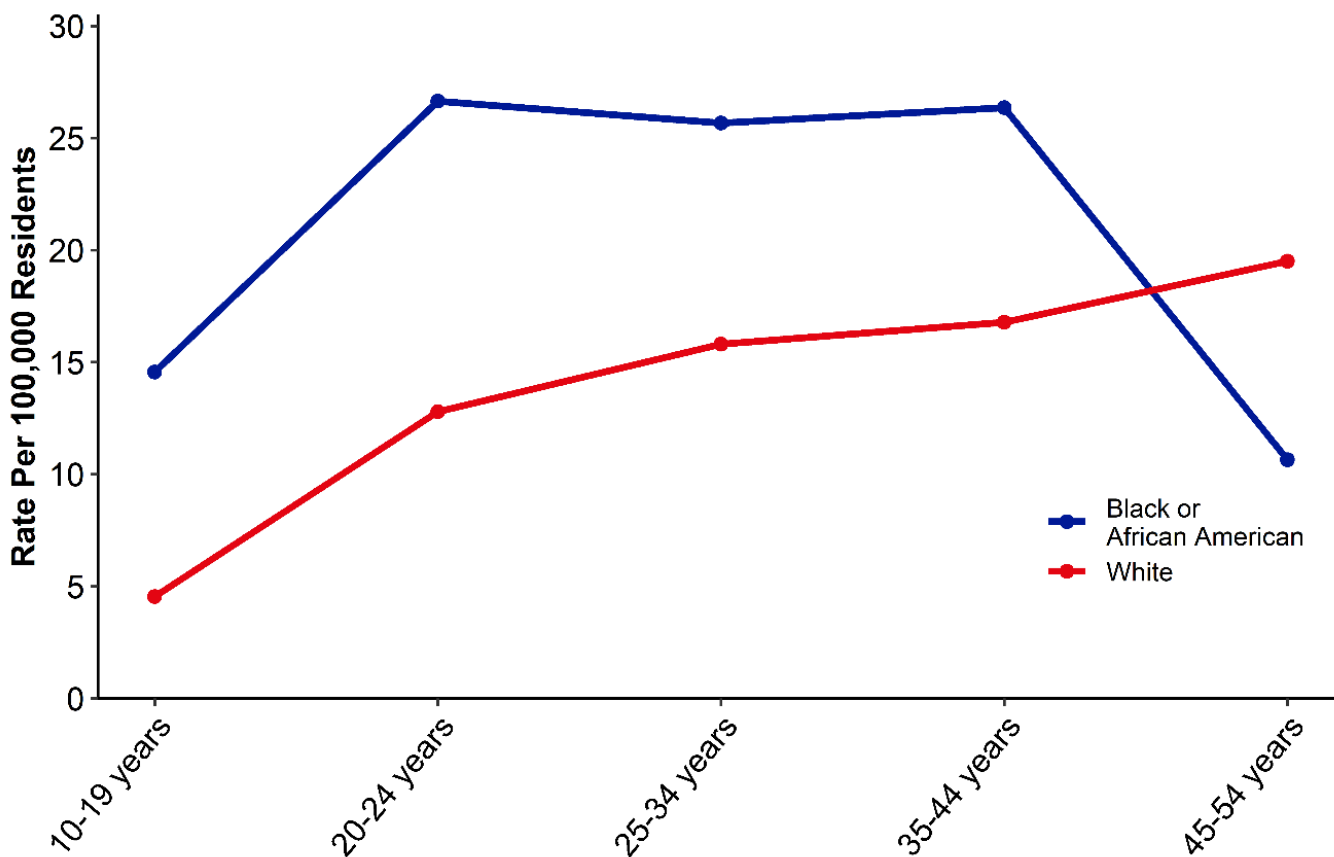
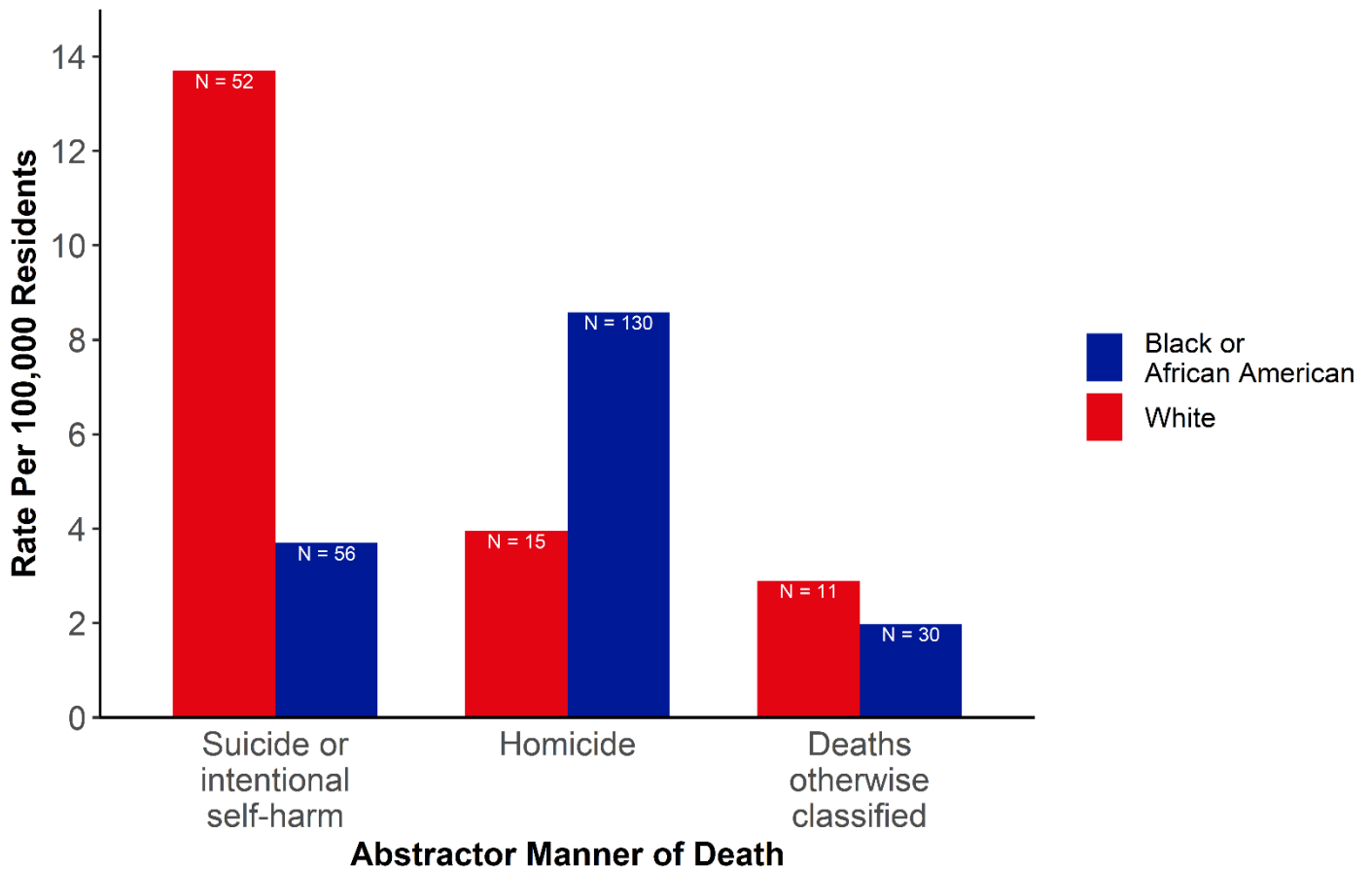




Figure 3 shows the racial distribution in the data by abstractor manner of death. The suicide mortality rate among White decedents is higher, but the homicide mortality rate among Black/African American decedents is higher. The mortality rate of deaths not classified as homicide or suicide (including deaths due to undetermined intent, unintentional firearm deaths, and deaths due to legal intervention) is slightly higher among White decedents.

**Figure 3.** Mortality Rate by Manner of Death by Race, 2020



TNVDRS collects multiple variables regarding the relationship status of the decedent, including marital status, relationship status, and sex of current partner. Table 6 presents information on the first two variables mentioned; fewer than ten decedents had a same-sex partner, and 137 (44.9%) of decedents had a partner of the opposite sex. For the remainder of decedents, current partner sex was unknown.

**Table 6.** Decedent Intimate Partner Status, 2020 (n = 305)

Marital Status	Relationship Status		
	Currently in relationship	Not in relationship	Unknown
Married/Civil Union/Domestic Partnership	80	*	*
Never Married or Unknown	40	11	97
Divorced, Separated, or Widowed	26	*	45

**Table 7.** Decedent Education and Occupation, 2020 (n = 287)\*

	Count	Percent
<b>Education Level</b>		
No high school diploma or unknown	47	16.4
HS graduate or GED completed	125	43.6
Some college	51	17.8
Associate's degree	21	7.3
Bachelor's degree	32	11.1
Graduate degree	11	3.8
<b>Occupation<sup>†</sup></b>		
Building and Grounds Cleaning and Maintenance	11	3.8
Food Preparation and Serving Related	24	8.4
Healthcare Practitioners and Technical	12	4.2
Healthcare Support	11	3.8
Management	11	3.8
Missing, unknown, inadequate response to code	17	5.9
Not in workforce <sup>‡</sup>	69	24.0
Office and Administrative Support	33	11.5
Other Categories (Aggregated)	27	9.4
Personal Care and Service	12	4.2
Production	15	5.2
Sales and Related	26	9.1
Transportation and Material Moving	19	6.6
<b>Military Status Per Death Certificate</b>		
Decedent has ever served in the US Armed Forces	12	4.2
No or unknown	275	95.8

\*Because these variables are not relevant for children and adolescent, values are tabulated for decedents aged 18 and older; rates cannot be determined due to population groupings, so percentages are shown instead

† 2018 SOC system used to categorize occupations. Documentation available at <https://www.bls.gov/soc/2018/home.htm>

‡ Includes student, homemaker, volunteers, those unable to work (eg, child, patient, inmate)

Table 7 shows information regarding the education and occupation of the decedent. Due to the nature of this information, we present counts for decedents aged 18 and above, and percentages are calculated in lieu of rates because of this. The majority of decedents had completed high school prior to death (43.6%), and 22.3% of decedents had a college degree of some level (associate's, bachelor's, or graduate-level).

Occupation data is collected on the death certificate, and prior to releasing the dataset to the state, the CDC uses this field to categorize occupations according to the 2018 SOC System<sup>1</sup>. These categories are presented in the table above. About twenty-four percent of decedents (24.0%) were not in the workforce at time of death. Eleven percent (11.5%) of decedents worked in positions categorized as "Office and Administrative Support." No other occupation category had a count higher than thirty in this population.

<sup>1</sup> The CDC generates multiple occupation variables based on the death certificate field. The 2018 SOC categories are presented in this table because they are the most straightforward to categorize and interpret in our opinion. More detailed occupation information is available if desired.

Information on military status in TNVDRS is collected again from the death certificate. This variable is representative of the decedent being in military service at any time prior to death; it does not distinguish between veterans or active-duty personnel. About four percent (4.2%) of decedents had a history of military service.

We also considered demographics regarding financial security and housing status, including the following:

- ❖ Job problem(s) appear to have contributed to the death
- ❖ Financial problem(s) appear to have contributed to the death
- ❖ Whether the decedent was homeless, defined as having no fixed address *and* living in a shelter, on the street, in a vehicle, or in makeshift quarters in an outdoor setting
- ❖ Acute or chronic instability in the decedent’s housing situation appears to have contributed to death
- ❖ A recent eviction or other loss of housing (or the threat of it) appears to have contributed to death

These variables were not included in any of the above tables because fewer than ten decedents experienced any of these circumstances. We note these variables because they may be of future interest once we have multiple years of TNVDRS data and can present aggregated data.

## IV. Deaths Due to Suicide

As stated in Table 1, 154 (50.5%) of decedents in this dataset had an abstractor manner of death of suicide or intentional self-harm. In this section, we will look at these incidents in closer detail by examining specifics about the method of death, including toxicology and firearm information when applicable, and circumstances in the decedent’s life prior to injury. We note again that while TNVDRS collects a wide variety of circumstance variables about each decedent, due to suppression of small counts, this information may not be available for this specific dataset.

**Table 8.** Method of Death Among Decedents Dying By Suicide, 2020 (n = 154)

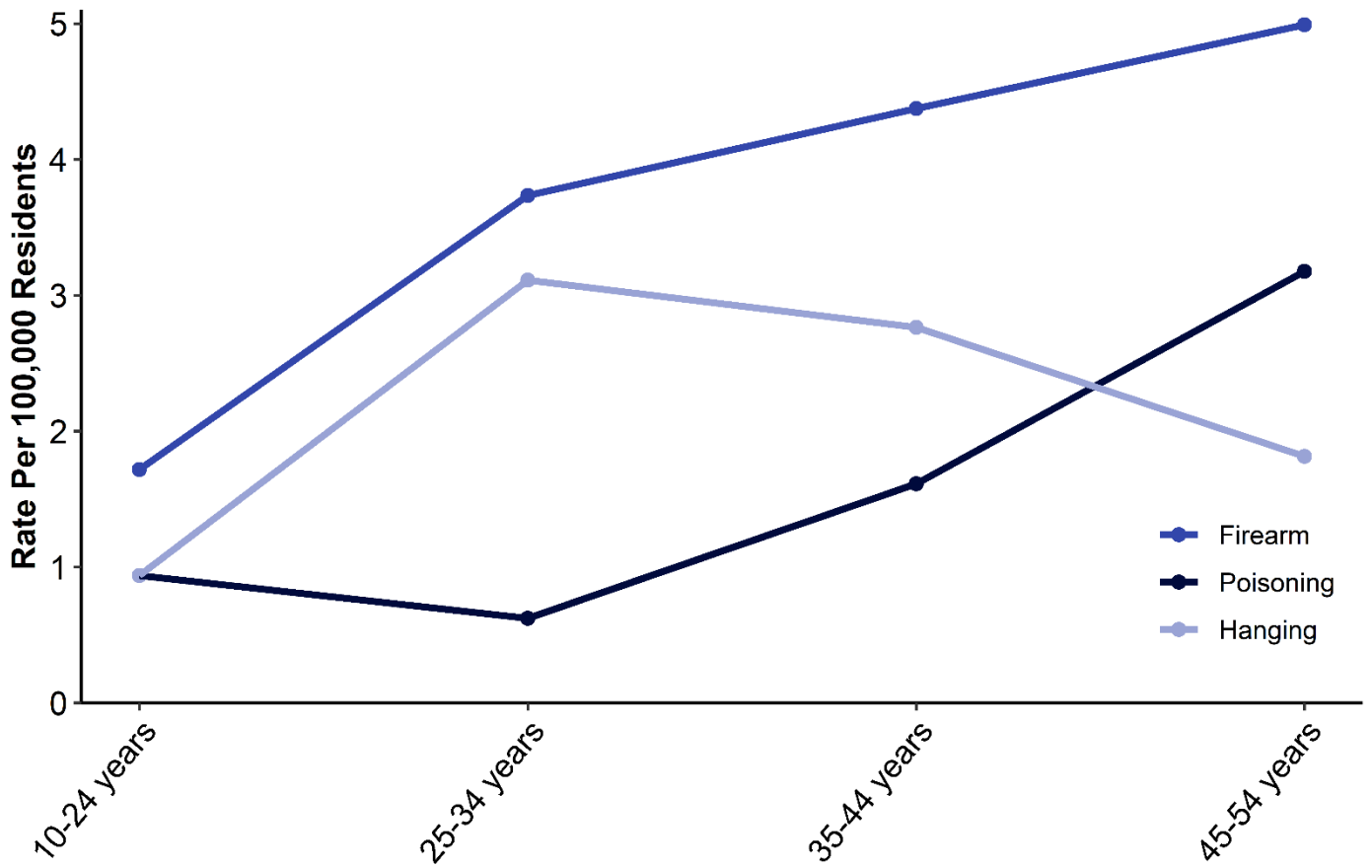
	Count	Rate
Firearm	70	3.50
Poisoning	30	1.50
Hanging	41	2.05
Other (aggregated)	13	0.65

\*TNVDRS is able to collect up to three weapons per decedent; no individual in this dataset had more than one weapon listed

Table 8 shows information about the method of death for each decedent in this subset. About forty-five percent (45.5%) of decedents who died by suicide used a firearm, followed by 26.6% dying due to hanging, 19.5% due to poisoning, and 8.4% due to methods including a sharp instrument, falling, drowning, motor vehicle, and methods not otherwise specified. The majority of decedents dying by

suicide were White (84.4%), 9.7% were Black or African American, and fewer than ten were in other racial categories.

**Figure 4.** Mortality Rate by Method of Death by Age, 2020



Sufficient count information was available to examine method of death by age in this cohort, as shown in Figure 4. The mortality rate of suicide deaths due to firearm and poisoning overall increased with age, while the mortality rate of suicide deaths due to hanging decreased for decedents aged 35 to 44 and 45 to 54 years.

**Table 9.** Firearm Information Among Decedents Dying By Suicide, 2020 (n = 70)\*

	Count	Percent
<b>Firearm Type</b>		
Handgun, semi-automatic pistol	30	42.9
Handgun, revolver	17	24.3
Unknown handgun or other firearm	14	20.0
<b>Firearm Storage</b>		
Stored unlocked	10	14.3
Unknown if stored locked or unlocked	57	81.4
Unknown if stored loaded or unloaded	61	87.1
<b>Firearm Owner</b>		
Decedent	12	17.1
Unknown	50	71.4

\*Categories with small counts not displayed; aggregation not possible

Table 9 shows information regarding the weapon used in the 70 deaths due to suicide by firearm. In 42.9% of these incidents, the firearm used was a semi-automatic pistol. In 24.3%, the firearm was a revolver. In the remaining 20%, the firearm was either an unknown type of handgun or another type of firearm. Information is also gathered on the storage and owner of the firearm. For 14.3% of incidents, the firearm was known to be stored unlocked; many other values on firearm storage had counts too small to display. For the majority of incidents (71.4%), the owner of the firearm was unknown, but the owner was known to be the decedent in 17.1% of incidents.

When examining the toxicology of decedents dying due to suicide, it is necessary to separate those dying by poisoning from other methods. This is because the circumstances around poisoning produce a very different pattern in toxicology than other methods of suicide. Because of this separation, we again have the issue of small counts suppressing the richness of the data TNVDRS collects.

Thirty decedents died by poisoning. Fewer than ten had no toxicology information available or substances listed on the death certificate. An average of exactly 5 substances was reported for each decedent in the dataset. This count represents every substance entered into the TNVDRS dataset, regardless of whether or not it is a potential metabolite.

The toxicology data were then de-duplicated by removing metabolites when substances were also detected. For example, if the toxicology shows fentanyl and norfentanyl, these are not two separate opioids. Rather, fentanyl was ingested and partially metabolized to norfentanyl prior to death. Thus, we can "remove" norfentanyl from the list because it is not a distinct substance. Some metabolites *are* also available in free form. For example, heroin metabolizes into a ratio of codeine and morphine, both of which are also substances that can be ingested separately. In the case that a potential metabolite is also a distinct substance, it is *not* "removed" from the list because we cannot know that the decedent did not take it as well. Finally, if a metabolite is present on the toxicology but the original substance is not (for example, if only norfentanyl is detected but fentanyl is absent), it is retained and counted as a proxy for the

original substance because it cannot be present if the original substance was not taken. This de-duplication process allows us to consider substances by individual in a more representative manner.

No individual substance appeared on the toxicology of ten or more decedents. We then aggregated substances into the following groupings:

- ❖ Acetaminophen: due to the liver toxicity of acetaminophen, it is often useful to consider distinctly
- ❖ Alcohol
- ❖ Antidepressants\*
- ❖ Antihistamines
- ❖ Antipsychotics
- ❖ Benzodiazepines
- ❖ Carbon monoxide
- ❖ Illicit substances, including marijuana\*
- ❖ Naloxone
- ❖ Prescription opioids, excluding fentanyl
- ❖ Other medications\*
- ❖ Other substances

Only the starred categories appeared on the toxicology report for ten or more decedents. The majority of decedents who died by poisoning (60%) had a substance classified as an “other medication” on their toxicology. This included substances such as blood pressure medication, digestive aids, NSAIDs, sedatives, etc. Fifty-three percent (53.3%) of decedents dying by poisoning had an antidepressant on their toxicology, and 30% had an illicit substance, including marijuana, on their toxicology report. Because the overwhelming majority of fentanyl is illicit, not prescribed, fentanyl is included in the “illicit substances” category.

The remaining 124 decedents who died by non-poisoning suicide can be considered together. Twenty-five of these (19.2%) had no toxicology information available. Table 10 on the following page shows toxicology information available on these decedents.

Among the 99 decedents with available toxicology, an average of 1.76 substances per decedent was reported. Twenty-eight decedents (28.3%) had no substances listed on their toxicology report, 23.3% had one substance listed, 19.2% had two substances listed, and 24.2% had three or more substances listed. It should be noted that as before, the number of substances reported does include potential metabolites.

Again, as before, known metabolites that are not distinct substances are removed from the data to tabulate individual substances. The results are shown in Table 10 as a combination of distinct substances when appropriate as well as aggregate drug classes. We decided to list all substances detected, suppressing counts less than ten, rather than not listing substances with small counts. This should give the reader insight into the breadth of toxicology data potentially available.

**Table 10.** Toxicology Information Among Decedents Dying By Non-Poisoning Suicide, 2020 (n = 99)

	Count	Percent
<b>Number of Substances on Toxicology</b>		
None	28	28.3
1	28	28.3
2	19	19.2
3 – 4	14	14.1
5 or more	10	10.1
<b>Substances and Classes</b>		
Acetaminophen	*	*
Amphetamine, excluding methamphetamine	*	*
Anticonvulsant	*	*
Antidepressant	10	10.1
Antipsychotic	*	*
Benzodiazepines	13	13.1
Cocaine	*	*
Decongestants	*	*
Ethanol	26	26.3
Fentanyl	*	*
Kratom/Mitragynine	*	*
Marijuana	19	19.2
Methamphetamine	13	13.1
Naloxone	*	*
No substances detected	28	28.3
Prescription opioid	*	*
Other medication	13	13.1
Volatile Alcohols*	*	*

Toxicology information not available for 25 (19.2%) of the 124 decedents dying by methods other than poisoning

\*Volatile alcohols include methanol, isopropanol, and acetone; ethanol is reported separately although it is chemically similar

We now turn our attention to the circumstances associated with each incident. Circumstances are collected from CME reports and LE reports separately, but we present the aggregation of circumstance variables here, meaning that if a circumstance is indicated on *either* CME or LE data or *both*, it is reported here as being endorsed. We have circumstance information for 152 decedents in this dataset who died by suicide, so the denominator for any percentages calculated here will be 152.

Circumstance variables in TNVDRS are endorsed primarily using a checkbox mechanic, meaning that if the variable is checked, it is “Yes,” but there is no distinction between whether a circumstance is unknown or confirmed not to have occurred. Thus, the counts indicate merely the decedents for which the circumstance is reported as having occurred in one or both data sources.

For some circumstances, abstractors have the option of indicating that the circumstance was “in crisis,” meaning that a crisis related to the circumstance occurred or was impending within two weeks of injury. For example, if the decedent had an alcohol problem and was known to have relapsed a week prior to death, both the “alcohol problem” and “alcohol problem in crisis” circumstance variables would be endorsed by the abstractor. Chronic circumstances are not coded as being “in crisis.” For example, a decedent in the process of a lengthy divorce would have the “civil legal problem” circumstance endorsed, but not the crisis variable, unless there had been a recent change such as an upcoming custody hearing that the decedent was concerned about. Not all circumstances have a crisis option. For example, “anniversary of a traumatic event” does not include a crisis variable.

Table 11 on the following page shows the decedent counts for a variety of circumstances collected in TNVDRS, focusing on those of interest for individuals who died by suicide. About sixty-six percent (66.4%) of decedents with available circumstances were identified as currently having a mental health problem at time of death. The majority of these were diagnosed with depression/dysthymia (67 of the 101 with a current diagnosis). About a third of these (29 out of 101) had multiple diagnoses.

Another variable TNVDRS collects relating to mental health is whether the decedent was perceived by themselves or others to be depressed at time of injury. It is important to note here that this variable is not related to clinical diagnosis, and there also does not need to be any indication that the depression directly contributed to injury. Twenty-six percent (26.3%) of decedents met the criteria for this variable to be endorsed.

Forty-two percent (42.1%) of decedents were in treatment for a mental health problem at time of death, and 52.0% of decedents had a history of treatment, either for a mental health or substance abuse (SA) problem. Thirteen percent (13.2%) had issues with alcohol, and 25.0% had a non-alcohol-related SA problem. For 6.6% of decedents, their physical health appeared to have contributed to injury, meaning that the decedent was experiencing physical health problems that were relevant to the event.

Twenty-seven percent (27.6%) of decedents had a history of attempting suicide prior to the incident resulting in death, and 34.2% of decedents had a history of suicidal ideation. Twenty-three percent (23.0%) of decedents disclosed suicidal thoughts or plans within the previous month. TNVDRS records persons disclosed to as separate variables so that if a decedent discloses to multiple individuals, this information can be adequately captured. The most common individuals disclosed to were intimate partners (current or former) and other family members. Other categories of persons disclosed to were aggregated due to small counts. Almost thirty-three percent (32.9%) of decedents left a suicide note or other recorded communication.

Among circumstances related to family and community problems, the most commonly endorsed variable was the one indicating that problems with an intimate partner (current or former) appear to have contributed to injury; this was indicated for 30.9% of decedents. For 66.0% of these (ie, 31 out of 47), this intimate problem was a crisis, meaning that it occurred at some point in the two weeks prior to injury. Other common circumstances were problems with other family members (9.9%), death of a family member or friend (7.9%), and contact with or otherwise known to local authorities in the past 12 months (16.4%). It should be noted that TNVDRS collects information separately on whether the prior death of a family member or friend was due to suicide or not, but due to small counts, these variables were aggregated in Table 11.



**Table 11.** Circumstances Related to the Incident for Deaths due to Suicide, 2020 (n = 152)

	Count	Percent
<b>Mental and Physical Health</b>		
Decedent identified as currently having a mental health problem	101	66.4
Has diagnosis of depression/dysthymia	67	44.1
Has diagnosis of an anxiety disorder	15	9.9
Has diagnosis of bipolar disorder	12	7.9
Has other diagnosis	18	11.8
Has unknown diagnosis	18	11.8
Has multiple diagnoses	29	19.1
Decedent is currently in treatment for a mental health problem	64	42.1
Decedent has a history of ever being treated for a mental health or substance abuse problem	79	52.0
Decedent perceived by self or others to be depressed at time of injury	40	26.3
Decedent had alcohol dependence or an alcohol problem	20	13.2
Decedent had a non-alcohol-related substance abuse problem	38	25.0
Decedent's physical health problem(s) appear to have contributed to injury	10	6.6
<b>Suicidal Ideation</b>		
Decedent had a history of attempting suicide before the fatal incident	42	27.6
Decedent had a history of suicidal thoughts or plans	52	34.2
Decedent disclosed to another person their suicidal thoughts/plans within the last month	35	23.0
Disclosed to previous or current intimate partner	12	7.9
Disclosed to other family member	12	7.9
Disclosed to other individuals, social media, or unknown	17	11.2
Decedent left a suicide note or other recorded communication	50	32.9
<b>Family and Community</b>		
Problems with a current or former intimate partner appear to have contributed to injury	47	30.9
Intimate partner problem was a crisis	31	20.4
Problems with a family member other than an intimate partner appear to have contributed	15	9.9
Death of a family member or friend appears to have contributed to injury <sup>†</sup>	12	7.9
An argument or conflict led to the death of the decedent	32	21.1
Injury occurred within 24 hours of the argument but not during	24	15.8
Decedent had contact with or was otherwise known to local authorities in the past 12 months	25	16.4

<sup>†</sup>Deaths due to suicide and non-suicide deaths are documented separately in TNVDRS but are aggregated here due to small counts

Another common circumstance endorsed was that an argument or conflict led to death; 21.1% of decedents indicated this circumstance. Of these, for 75% of decedents (ie, 24 out of 32), injury occurred within 24 hours of the argument but not during.

The following circumstances were considered but not included in Table 11 due to small counts:

- ❖ Decedent had a history of non-suicidal self-injury or self-harm
- ❖ Decedent had an addiction other than alcohol or other substance abuse that appears to have contributed to injury
- ❖ Decedent had a history of abuse or neglect as a child
- ❖ Stress or burden perceived by the decedent as a caregiver appears to have contributed to injury
- ❖ A family stressor(s) appears to have contributed to injury
- ❖ Problems with a friend or associate appear to have contributed to injury
- ❖ Incident occurred on or near the anniversary of a traumatic event in the decedent's life and was perceived as a contributing factor
- ❖ Decedent was a perpetrator of violence within the past month that was distinct from and occurred before the incident where injury occurred
- ❖ Decedent experienced violence in the past month that was distinct from and occurred before the incident where injury occurred
- ❖ Civil legal (non-criminal) problems appear to have contributed to injury
- ❖ Criminal legal problems appear to have contributed to injury
- ❖ Death was precipitated by another serious crime

We again note these circumstances because they may be of future interest once TNVDRS has multiple data years available.

## V. Deaths Due to Homicide

As stated in Table 1, 110 (36.1%) of decedents in this dataset had an abstractor manner of death of homicide. In this section, we will examine these incidents further by looking at method of death, firearm information when applicable, suspect information if available, toxicology information, and circumstances in the decedent's life prior to injury. We note as in the previous section that due to small counts, some of the information TNVDRS collects may not be available for this specific dataset.

It is often more useful in homicide deaths to consider the characteristics of the overall incident. TNVDRS is organized in a hierarchical structure to attempt to capture more complex scenarios – an incident consists of decedents who are potentially victims or suspects. One incident can contain details about multiple decedents, each abstracted as separate individuals. In the previous section, we did not utilize this structure because “victim/suspect” terminology is generally inappropriate when discussing decedents who die by suicide. However, in this section, we will first explore how the incidents in this dataset are structured.

The 110 decedents who died due to homicide were involved in **106** incidents. Table 12 on the following page describes relevant characteristics of these incidents.

**Table 12.** Characteristics of Homicide Incidents Involving Females Aged 10 to 54, 2020 (n = 106)

	Count	Percent
<b>Incident Type*</b>		
Single homicide	75	70.8
Multiple homicide	17	16.0
Single homicide followed by suicide	10	9.4
<b>Number of Deaths in Incident</b>		
One victim	86	81.1
More than one victim	24	22.6
Incidents in which suspect also died	17	16.0
<b>Number of Suspects in Incident</b>		
One suspect	91	85.8
More than one suspect or unspecified	19	17.9

\*Small-count categories not displayed

Almost seventy-one percent (71.8%) of homicides involving a victim in our dataset were single homicides. Additionally, 16.0% were multiple homicides and 9.4% were single homicides followed by suicide<sup>2</sup>. There were other incident types that are not detailed in Table 12 due to small counts.

In 81.1% of homicide incidents, there was one victim death. In 22.6% of homicide incidents, more than one victim died. In 16.0% of homicide incidents, the suspect also died. In 85.8% of homicide incidents, there was one suspect. In the remaining 17.9%, there were either multiple suspects or the number was not specified.

**Table 13.** Primary Weapon for Decedents Dying By Homicide, 2020 (n = 110)

	Count	Rate
Firearm	83	4.16
Sharp instrument	10	0.50
Other (aggregated)	17	0.85
Multiple weapons indicated	12	0.60

Table 13 shows information about the method of death/weapon used. A firearm was used as the method of death for 75.5% of the decedents, and a sharp instrument was used for 9.1% of decedents. The other weapon categories were aggregated due to small counts in each section.

TNVDRS allows the abstractor to enter up to three weapons per decedent. Almost eleven percent (10.9%) of decedents had more than one weapon indicated. For fewer than ten decedents, the multiple weapons were of the same type (eg, multiple different firearms used).

<sup>2</sup> Note here that the subset we are discussing here is defined as all individuals in our dataset with an abstractor manner of death of homicide. Individuals involved in a homicide-suicide that would be characterized as the suspect, meaning that they perpetrated a homicide before dying by suicide in the same incident, would be presented in the subset in section IV instead of here.

**Table 14.** Wound Information for Homicide Decedents Dying by Firearm or Sharp Instrument, 2020 (n = 96)

	Count	Percent
<b>Number of Bullets that Hit the Victim (n=83)*</b>		
1	39	47.0
2	11	13.3
More than two or multiple, unspecified	28	33.7
<b>Number of Wounds to the Victim</b>		
1	26	27.1
2	21	21.9
3 – 4	13	13.5
5 – 10	15	15.6
More than ten or multiple, unspecified	20	20.8
<b>Location of Wound(s) on the Body</b>		
Head	35	36.5
Face	24	25.0
Neck	25	26.0
Upper extremity	33	34.4
Thorax or upper back	46	47.9
Abdomen or lower back	25	26.0
Lower extremity	21	21.9

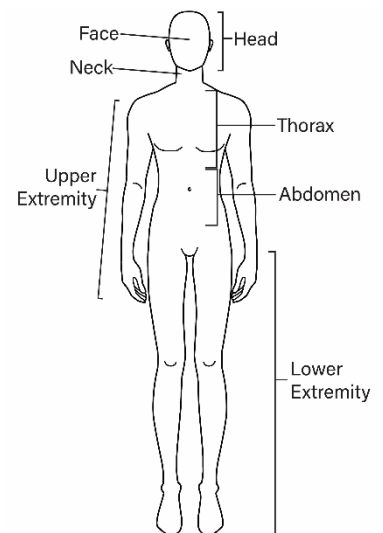
\*Only collected in incidents where a firearm was used

TNVDRS collects information about the number of wounds, number of bullets, and wound location in incidents involving firearms or sharp instruments. At least one of these weapons was used in incidents involving 96 decedents; note that this count includes decedents where multiple weapons were used (eg, strangulation and sharp instrument), meaning that some of these counts may be included in the "Other (aggregated)" section of Table 13. Table 14 summarizes the wound information for the 96 decedents where this information was collected, and Figure 5 shows a diagram of wound locations for reference.

For 47.0% of the 83 decedents who died by homicide involving a firearm, one bullet hit the victim. For 13.3% of decedents, two bullets hit the victim, and for 33.7% of decedents either more than two bullets hit the victim or the number of bullets was unspecified.

For decedents who died by homicide involving a firearm or sharp instrument, 27.1% had one wound, 21.9% had two wounds, 13.5% had three to four wounds, 15.6% had between five and ten wounds, and 20.8% had either more than ten wounds or a number of multiple wounds that was unspecified. For 36.5% of these decedents, at least one wound was located on the head. For 25.0%, at least one wound was located on the face. For 26.0% of decedents, at least one wound was located on the neck. For 34.4% of decedents, at least one wound was located on an upper extremity, ie, a shoulder, arm or hand. For 47.9%, at least one wound was located on the thorax, which is the region between the

**Figure 5.** Wound Location



neck and diaphragm, or upper back. For 26.0%, at least one wound was located on the abdomen or lower back. For 21.9% of decedents, at least one wound was located on a lower extremity, ie, a foot, hip, or leg.

**Table 15.** Firearm Information Among Decedents Dying By Homicide, 2020 (n = 87\*)

	Count	Percent
<b>Firearm Type</b>		
Handgun, semi-automatic pistol	33	37.9
Handgun, revolver or unknown	16	18.4
Rifle or shotgun, all types	11	12.6
Unknown type	27	31.0
<b>Firearm Storage</b>		
Stored loaded	12	13.8
Stored unlocked	13	14.9
<b>Firearm Owner</b>		
Unknown	79	90.8

\*87 weapons were involved in the deaths of 83 decedents. Percentages are calculated using the total number of firearms.

As in the previous section, TNVDRS collects information about the firearms used in an incident, when known. Among the 83 decedents, 87 firearms were used. Almost thirty-eight (37.9%) of these firearms were semi-automatic pistols. Eighteen percent (18.4%) were other handgun types. Twelve percent (12.6%) were rifles or shotguns, and 31.0% of firearms were of unknown type. For 13.8% of firearms, they were stored loaded, and 14.9% were stored unlocked. For 90.8% of firearms, the owner was unknown. TNVDRS offers the option to collect information on whether or not the firearm was stolen, but that variable is not populated in this particular dataset.

In homicides, TNVDRS collects suspect information as well as victim information, when available. Recall from the beginning of the section that we are discussing 106 incidents. There are 110 victims and 114 suspects across these incidents. For 10 incidents, the number of suspects is unknown, so for the suspect information presented in Table 16, there are multiple suspects in some of these incidents.

Table 16 presents information gathered on suspects, when known. Twenty-six percent (26.3%) of suspects were below 25 years of age, 19.3% were between 25 and 34 years old, 11.4% were between 35 and 44 years old, 14.9% were 45 years and older, and age was unknown for 28.1% of suspects. Most suspects (86.0%) were male. Thirty percent (30.7%) of suspects were White, 51.8% were Black or African American, and 17.5% were either a different racial category or unknown.

For 33.3% of suspects, their relationship to the victim is unknown, but 20.2% of suspects were a girlfriend or boyfriend (either current or former) of the victim, and 12.3% of suspects were the spouse of the victim. The remaining relationship categories on Table 16 are aggregates of a variety of relationships, none of which had a count of ten.

**Table 16.** Suspect Demographics and Relationships, 2020 (n = 114)

	Count	Percent
<b>Age of Suspect</b>		
Below 25 years	30	26.3
25 – 34 years	22	19.3
35 – 44 years	13	11.4
Above 45 years	17	14.9
Unknown	32	28.1
<b>Sex of Suspect</b>		
Male	98	86.0
Female or unknown	16	14.0
<b>Race of Suspect</b>		
White	35	30.7
Black or African American	59	51.8
Other, unspecified, or unknown	20	17.5
<b>Primary Relationship of Suspect to Victim</b>		
Spouse	14	12.3
Girlfriend or boyfriend (current or former)	23	20.2
Family relationship*	10	8.8
Other relationship or stranger**	29	25.4
Relationship unknown	38	33.3
<b>Circumstances Related to Suspect</b>		
There is a history (or suspected history) of abuse of victim by suspect	12	10.5
Suspect attempted suicide (fatally or non-fatally) after the death of the victim	15	13.2

\*Includes parent, sibling, in-law, stepchild, and foster child

\*\*Includes acquaintance, friend, current or former work relationship, victim was new partner of suspect's ex-partner, victim was ex-partner of suspect's current partner, and stranger

The suspect circumstances shown in Table 16 were the only variables with counts ten or higher. Ten percent (10.5%) of suspects had a history (or suspected history) of abuse of the victim. In these cases, the suspect may either be a caregiver of the victim (including children taking care of their parents) or a current or former intimate partner. Thirteen percent (13.2%) of suspects attempted suicide, either fatally or non-fatally, after the death of the victim. Other circumstances examined that did not have sufficient counts for display include:

- ❖ Suspect was a caregiver for this victim
- ❖ Suspect's attack on the victim is believed to be the direct result of a mental illness
- ❖ Suspected alcohol use by the suspect in the hours preceding the incident
- ❖ Suspected substance abuse by the suspect in the hours preceding the incident
- ❖ Suspect injured victim within a month of being released from or admitted to an institutional setting
- ❖ Suspect had contact with law enforcement in the past 12 months

**Table 17. Toxicology Information Among Decedents Dying By Homicide, 2020 (n = 103)**

	Count	Percent
<b>Number of Substances on Toxicology</b>		
None	29	28.2
1	29	28.2
2	13	12.6
3 – 4	20	19.4
5 or more	12	11.7
<b>Substances and Classes</b>		
Alcohol	23	22.3
Fentanyl or fentanyl analog	14	13.6
Marijuana	35	34.0
Methamphetamine	23	22.3
No substances detected	29	28.2
Other illicit substances	12	11.7
Other medication	15	14.6
Prescription opioid	13	12.6

Toxicology information available for 93.6% of the 110 decedents dying by homicide

Toxicology information was available for 93.6% of decedents dying by homicide. This information is shown in Table 17. The distribution of the number of substances of decedents dying by homicide is similar to the distribution in Table 10 of decedents dying by non-poisoning suicide. The average number of substances listed in TNVDRS for these decedents is 1.89. Twenty-eight percent (28.2%) of decedents had no substances detected in their toxicology report.

Marijuana was the most common substance among homicide victims; 34.0% of decedents were positive for marijuana. Methamphetamine (22.3%) and alcohol (22.3%) were the second-highest percentage. The types of substances detected for homicide victims create a very different profile than the types detected for individuals who died by suicide.

Finally, we turn our attention to the circumstance variables collected in TNVDRS for these decedents, shown in Table 18. Circumstance information is available for 109 decedents. For 40.4% of decedents, death was related to immediate or ongoing intimate partner violence. Twenty-one percent (21.1%) of decedents had contact with or were otherwise known to local authorities in the past 12 months. For 38.5% of decedents, an argument or conflict led to death, and for 69.0% of these (ie, 29 out of the 42 decedents where this circumstance was endorsed), injury occurred during the argument itself. For an additional 26.2% (ie, 11 out of the 42 decedents), injury occurred not during the argument but within the subsequent 24 hours.

**Table 18.** Circumstances Related to the Incident for Deaths due to Homicide, 2020 (n = 109)

	Count	Percent
<b>Family and Community</b>		
Death was related to immediate or ongoing conflict or violence between intimate partners (current or former)	44	40.4
Decedent had contact with or was otherwise known to local authorities in the past 12 months	23	21.1
<b>Arguments Related to Incident</b>		
An argument or conflict led to the death of the decedent	42	38.5
Injury occurred during the argument	29	26.6
Injury occurred within 24 hours of the argument but not during	11	10.1
<b>Legal Circumstances</b>		
Death was precipitated by another serious crime	24	22.0
Precipitating crime was in progress at the time of the incident	15	13.8
<b>Additional Circumstances</b>		
Victim was killed in a shooting where a vehicle is used <sup>†</sup>	18	16.5
Drug dealing, trade, or use is suspected to have played a role in precipitating the incident	18	16.5

<sup>†</sup>Potential scenarios include the suspect driving near the victim and shooting while driving, or using a vehicle to approach and flee the scene, but stepping out of the vehicle just long enough to use a weapon

For 22.0% of decedents, death was precipitated by another serious crime. In cases where information about the nature of the precipitating crime was known, these include drug trade, robbery, burglary, rape/sexual assault, and assault/homicide. All of these counts were fewer than ten. For 62.5% of these (ie, 15 out of the 24 decedents where this circumstance was endorsed), the precipitating crime was in progress at the time of the incident.

Sixteen percent (16.5%) of decedents were killed in a shooting where the suspect either drove by the victim, shooting while driving, or the suspect used a vehicle to approach and flee the scene, but stepped out of the vehicle just long enough to use a weapon. Additionally, for 16.5% of decedents, drug dealing, trade, or use is suspected to have played a role in precipitating the incident.

The following circumstances were considered but not included in Table 18 due to small counts:

- ❖ Jealousy or distress over an intimate partner's relationship (current or former) or suspected relationship with another person led to the incident
- ❖ Decedent was a perpetrator of violence within the past month that was distinct from and occurred before the incident where injury occurred
- ❖ Decedent experienced violence in the past month that was distinct from and occurred before the incident where injury occurred
- ❖ Victim had relationship problems with a family member other than an intimate partner than appear to have contributed to injury
- ❖ A family stressor(s) appears to have contributed to injury
- ❖ Problems with a friend or associate appear to have contributed to injury
- ❖ Injury was directly related or precipitated by abuse by a caretaker
- ❖ Victim had a history of abuse or neglect as a child



- ❖ Victim’s household had contact with or was otherwise known to authorities in the past 12 months
- ❖ Immediately before death, a physical fight between two individuals resulted in the death of individuals involved in the fight, bystanders, or individuals trying to stop the argument
- ❖ Sex work or sex-work-related activities played a precipitating role in the incident
- ❖ Death was classified as gang motivated or had suspected involvement of a gang member
- ❖ Victim was a bystander, not the intended target
- ❖ Victim was killed by a “random act of violence,” defined as one in which the suspect is not concerned with who is being harmed, just that someone is being harmed
- ❖ Victim was an intervener other than a law enforcement officer who was killed while assisting a crime victim
- ❖ Victim used a weapon during the course of the incident
- ❖ Incident was a targeted attack where the suspect(s) approached and fled on foot

As in previous sections, we note these circumstances because they may be of future interest once TNVDRS has multiple data years available.

## VI. Deaths Otherwise Classified

In addition to deaths due to homicide and suicide, TNVDRS collects data on unintentional firearm deaths, deaths due to legal intervention, and deaths of undetermined intent. There are 41 decedents in this dataset that fall into one of these categories. The number of unintentional firearm deaths and deaths due to legal intervention is too small to present any further details, but we would like to provide a brief overview of the deaths due to undetermined intent in this dataset.

A death is characterized as “due to undetermined intent” if it is a death resulting from the use of force or power 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, according to the judgement of death investigators. For these incidents, the cause of death is known and it resulted from the use of force or power against oneself (suicide) or another person (homicide) or that mechanism of death is an unspecified trauma<sup>3</sup>.

The death certificate for these cases typically has a manner of “could not be determined,” but it is important to note that this death certificate manner is broader than the cases included in our dataset. For example, a decedent who potentially died due to either an accidental overdose or natural disease (eg, someone who had progressive heart disease but potentially took too much blood thinner) would have a manner of “could not be determined” on their death certificate, but this case would not be included in TNVDRS because of the lack of indication of use of force or power.

It should not be surprising that these are complex cases, difficult to characterize not only due to the low number of them, but also because they are included in this umbrella of “undetermined intent” due to a *lack* of information rather than a presence of it. This lack of information means that potential patterns are obscured. Additionally, the complexities make it challenging to present the data that is present due to

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<sup>3</sup> Definition taken directly from NVDRS coding manual, p. 10-11

efforts to maintain the de-identified nature of the data. The narratives attached to these cases are so unique that they become identifiable in manual review.

Because of this, the information we can provide on these decedents at this time is limited to the following:

- ❖ 27 decedents (65.9%) are characterized as dying due to an overdose of undetermined intent
- ❖ 24 (58.5%) are cases where death was possibly accidental, but an intentional act cannot be ruled out
- ❖ The average age at death is 34.2 years, as opposed to 37.0 years for decedents dying by suicide and 32.3 years for decedents dying by homicide
- ❖ 73.2% of decedents were White and 26.8% of decedents were Black or African American

## VII. Next Steps

The objective of TNVDRS is to help state and local officials understand why violent deaths occur to aid prevention and support efforts. This report communicates not just the information available on violent deaths among women aged 10 to 54 in 2020 but also attempts to convey the future additional variables that may be of interest as TNVDRS data collection continues. Our focus is currently on descriptive reporting because we only have a single year of data available, but we are eager to partner on analyses and studies in the future once we have the data to support robust linkages and counts.

All tables and figures in this report are available as individual files by request, and if any alternative presentations are of interest, our team is happy to generate those as well. If portions of this report are used in other data products, we would ask that our team is given a chance to review them prior to dissemination.

For all requests, questions, or comments, you can reach our team at [TN.VDRS@tn.gov](mailto:TN.VDRS@tn.gov).

Report prepared by:

Molly Golladay | Epidemiologist II

TNVDRS

Tennessee Department of Health

Office of the State Chief Medical Examiner

[molly.golladay@tn.gov](mailto:molly.golladay@tn.gov)

615-339-3163

