



WILLIAM L. JENKINS  
FORENSIC CENTER

EAST TENNESSEE STATE UNIVERSITY

# ANNUAL REPORT

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# 2023



William L. Jenkins Forensic Center  
ETSU Division of Forensic Pathology  
Box 70425  
Johnson City, TN 37614  
(423) 439-8038

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# I. William L. Jenkins Regional Forensic Center Operations

## Mission Statement

The mission of the William L. Jenkins Forensic Center is to provide the highest level of service to the people of northeast Tennessee. The center investigates and documents deaths which fall under the Medical Examiner's jurisdiction with professionalism, compassion and efficiency.

The facility will investigate cooperatively with, but independently from, law enforcement and prosecutors in our region to provide impartial and professional quality death investigation and to document the circumstances, evidence, and contributing factors associated with cases that fall under the Medical Examiner jurisdiction.

We are further dedicated to the interest of public health and public safety of the citizens of upper east Tennessee, across the state, and nationally.

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## History

The Upper East Tennessee Forensic Center began operating in 1985 through the Department of Pathology with East Tennessee State University, Division of Forensic Pathology. The Forensic Center operated out of a small one-room morgue in the basement of the Pathology Department on the Quillen College of Medicine/Veterans Administration Campus in Johnson City and served the eight counties of the First Tennessee Development District (Carter, Greene, Hancock, Hawkins, Johnson, Sullivan, Unicoi and Washington Counties). Each county appointed a physician to serve as their County Medical Examiner. The purpose of the Forensic Center was to perform autopsies ordered by the County Medical Examiner and provide an opinion as to the cause and manner of death, based on their findings.

In 2007, the Upper East Tennessee Forensic Center began operating in its own facility in a historic building on the Veterans Administration Campus in Johnson City, renovated with funding provided by the State of Tennessee and the eight counties of the First Tennessee Development District, and officially named the William L. Jenkins Forensic Center (Regional Forensic Center) after the Hawkins County congressman who assisted in obtaining funding for the Forensic Center. In 2014, Karen Cline-Parhamovich, D.O., a forensic pathologist with the Forensic Center, was appointed to serve as Washington County Medical Examiner, and then the remainder of the counties in the First Judicial District (Carter, Unicoi and Johnson) appointed her their Medical Examiner as well. Currently, Emilie Cook, D.O., Director of the William L. Jenkins Forensic Center, serves as the Interim County Medical Examiner for Carter, Johnson, Unicoi and Washington Counties. The William L. Jenkins Forensic Center also provides autopsy and consultative services to Greene, Hancock, Hawkins and Sullivan Counties.

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## Accreditation



The William L. Jenkins Forensic Center received accreditation from the National Association of Medical Examiners (NAME) in October 2014. We have maintained full accreditation. The NAME Accreditation process consists of a rigorous inspection of the physical facility and review of the office practices, including that the application of the standards set forth by NAME. Maintenance of accreditation ensures that the Forensic Center maintains a high caliber medicolegal death investigation system for the communities in the jurisdiction for which we serve. A full on-site inspection will occur again in October 2024. Information regarding inspection and accreditation is available at <https://www.thename.org>

Table 1.1 below shows selected statistics generated by year for NAME accreditation from 2018 to 2022; the process is on-going for 2023.

**Table 1.1 Selected NAME Criteria for 2018-2022**

	2018	2019	2020	2021	2022
Deaths Reported to Office	2124	2251	2499	2868	2383
Cases Accepted by Office	661	683	699	880	945
Total Number of Complete Autopsies	547	495	475	665	636
Total Number of External Examinations	114	188	217	200	301
Total Number of Partial Autopsies	0	0	7	14	10
Records Review	4	5	18	32	51
Cases where Toxicology is Performed	541	541	531	778	718
Cases where Histology is Performed	285	264	275	338	292
Scene Visits	363	402	521	329	571
Bodies Transported by Office or Order of Office	661	683	699	880	945
Jurisdiction Declined but Accepted for Storage Only	38	38	53	50	44

## Service

The William L. Jenkins Forensic Center is the Forensic Pathology Division and under the purview of the Department of Pathology with East Tennessee State University's Quillen College of Medicine. It serves as the Office of the Chief Medical Examiner for Washington, Carter, Unicoi and Johnson Counties and provides autopsy and consultative services for four other counties (Greene, Hancock, Hawkins, Sullivan Counties) in northeast Tennessee. Services are provided 24 hours a day, seven days a week, with a Medical Examiner/Forensic Pathologist on-call and a Medicolegal Death Investigator available to respond to death scene investigations.

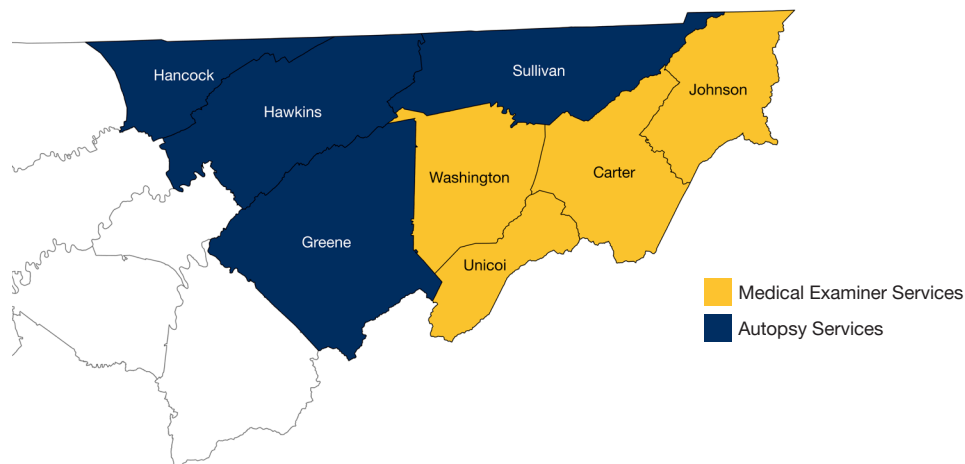
## Coverage

The Forensic Center Staff provide services to its four jurisdictional counties (Carter, Johnson, Unicoi, and Washington) and four non-jurisdictional counties (Greene, Hancock, Hawkins, and Sullivan).

Jurisdictional counties (yellow on map) are those where Dr. Emilie Cook is the Chief Medical Examiner. For Washington County the Regional Forensic Center (RFC) investigators serve as county Medicolegal Death Investigators (MDI). In Carter, Johnson and Unicoi each county has a Field Medicolegal Death Investigator (FMDI) appointed to serve as primary death investigator and report to the RFC. The RFC investigators will also respond to sudden unexplained infant deaths, homicides, multiple fatalities and deaths deemed suspicious alongside the FMDI in Carter, Johnson and Unicoi Counties.

Non-jurisdictional counties (blue on the map below) are those where there is an appointed county Medical Examiner (not Dr. Emilie Cook or one of the RFC Deputy Medical Examiners). The county Medical Examiner is a physician licensed in Tennessee and responsible for conducting medicolegal death investigative activities. These agencies may or may not also have Medicolegal Death Investigators working in their counties.

**Map 1.1 Regional Forensic Center Coverage Map**



## Legal Jurisdiction

*Tennessee Code Annotated §38-7-104 – County Medical Examiner*

A county Medical Examiner shall be appointed by the county mayor, subject to confirmation by the county legislative body, based on a recommendation from a convention of physicians residents in the county. A county Medical Examiner shall be a physician who is either a graduate of an accredited medical school authorized to confer upon graduates the degree of doctor of medicine (M.D.) and who is duly licensed in Tennessee, or is a graduate of a recognized osteopathic college authorized to confer the degree of doctor of osteopathy (D.O.) and who is licensed to practice osteopathic medicine in Tennessee, and shall be elected from a list of a maximum of two (2) doctors of medicine or osteopathy nominated by convention of the physicians, medical or osteopathic, residents in the county, the convention to be called for this purpose by the county mayor.

### *Tennessee Code Annotated §38-7-104 – Medicolegal death investigators*

A medical investigator shall be a licensed emergency medical technician (EMT), paramedic, registered nurse, physician's assistant or a person registered by or a diplomat of the American Board of Medicolegal death investigators and approved by the county Medical Examiner as qualified to serve as medical investigator. The county medical investigator may conduct investigations when a death is reported, as provided in §38-7-108, under the supervision of the county Medical Examiner. The county medical investigator may make pronouncements of death and may recommend to the county Medical Examiner that an autopsy be ordered. However, the county medical investigator shall not be empowered to sign a death certificate. The county Medical Examiner may delegate to the county medical investigator the authority to order an autopsy.

### *Tennessee Code Annotated §38-7-108 – Death under suspicious, unusual or unnatural circumstances*

Any physician, undertaker, law enforcement officer, or other person having knowledge of the death of any person from violence or trauma of any type, suddenly when in apparent health, sudden unexpected death of infants and children, deaths of prisoners or persons in state custody, deaths on the job or related to employment, deaths believed to represent a threat to public health, deaths where neglect or abuse of extended care residents are suspected or confirmed, deaths where the identity of the person is unknown or unclear, deaths in any suspicious/unusual/unnatural manner, found dead, or where the body is to be cremated, shall immediately notify the county Medical Examiner or the district attorney general, the local police or the county sheriff, who in turn shall notify the county Medical Examiner.

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## **Function**

Each county in Tennessee is required to have a licensed physician appointed by the county commissioners to serve as the Medical Examiner. The Office of the Medical Examiner is responsible for investigating deaths reported based upon the Tennessee State Statute 38-7-108. William L. Jenkins Forensic Center (WLJFC) Board Certified Pathologists serve as Medical Examiner and deputy Medical Examiners for Washington County, Carter County, Unicoi County and Johnson County.

In general, the deaths investigated by our office include those that are sudden, unexpected, often times violent, and not readily explainable at the time of death.

Because deaths occur regardless of time or day, the Medical Examiner's office responds to deaths 24 hours per day, 365 days per year. These deaths are investigated by Medicolegal Death Investigators (MDIs) that arrive to death scenes to gather information from families and law enforcement, and exam/photograph the body and surroundings. This information will be relayed to Forensic Pathologists for case management.

### *Which deaths do we investigate?*

Any physician, undertaker, law enforcement officer, or other person having knowledge of the death of any person from the following reportable deaths shall immediately notify the county Medical Examiner or the district attorney general, the local police or the county sheriff, who in turn shall notify the county Medical Examiner in the county in which the death occurred.

### Reportable Deaths:

- violence or trauma of any type,
- suddenly when in apparent health,
- sudden unexpected death of infants and children,
- deaths of prisoners or persons in state custody,
- deaths on the job or related to employment,
- deaths believed to represent a threat to public health,
- deaths where neglect or abuse of extended care residents are suspected or confirmed,
- deaths where the identity of the person is unknown or unclear,
- deaths in any suspicious/unusual/unnatural manner, found dead, or where the body is to be cremated.

We also consider the NAME standards in deciding which deaths to investigate which include:

- Deaths due to violence
- Known or suspected non-natural deaths
- Unexpected or unexplained deaths when in apparent good health
- Unexpected or unexplained deaths of infants and children
- Deaths occurring under unusual or suspicious circumstances
- Deaths of persons in custody
- Deaths known or suspected to be caused by diseases constituting a threat to public health
- Deaths of persons not under the care of a physician.

### *Identification of Decedent*

Tennessee State Statute 38-7-108 requires a scientific identification in cases where visual identification of a decedent is impossible as a result of burns, decomposition, or other disfiguring injuries or the death is the result of an accident that involved two or more individuals who were approximately the same age, sex, height, weight, hair color, eye color, and race. In these cases, the county Medical Examiner is required to verify the identity of the decedent through fingerprints, dental records, DNA, or another definitive identification procedure.

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## **Indications for a Complete Autopsy**

The decision regarding whether a complete autopsy should be performed is based on the NAME Autopsy Performance Standards. Consequently, an autopsy is performed when the:

- The death is known or suspected to have been caused by apparent criminal violence.
- The death is unexpected and unexplained in an infant or child.
- The death is associated with police action.
- The death is apparently non-natural and in custody of a local, state, or federal institution.
- The death is due to acute workplace injury.<sup>\*\*\*</sup>
- The death is caused by apparent electrocution.<sup>\*\*\*</sup>
- The death is by apparent intoxication by alcohol, drugs, or poison, unless a significant interval has passed, and the medical findings and absence of trauma are well documented.
- The death is caused by unwitnessed or suspected drowning.<sup>\*\*\*</sup>
- The body is unidentified and the autopsy may aid in identification.
- The body is skeletonized.
- The body is charred.
- The forensic pathologist deems a forensic autopsy is necessary to determine cause or manner of death, or document injuries/disease, or collect evidence.

- The deceased is involved in a motor vehicle incident and an autopsy is necessary to document injuries and/or determine the cause of death.

\*\*\* Unless sufficient antemortem medical evaluation has adequately documented findings and issues of concern that would otherwise have required autopsy performance.

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## Death Certification

The main focus of our investigation is to determine the cause and manner of death, and to clarify or confirm circumstances surrounding the death. The cause of death is related to the underlying disease and/or injury that resulted in the individual's death. The manner of death, in the state of Tennessee, is limited to these possibilities: natural, accident, suicide, homicide, or undetermined.

*What is the difference between Cause of Death and Manner of Death?*

The Cause of Death is (a) the disease or injury that initiated the sequence of morbid events leading directly to death, or (b) the circumstances of the accident or violence that produced fatal injury.

Unlike the cause of death, with thousands of possibilities, in Tennessee, manner of death is limited to: Natural, Suicide, Accident, Homicide and Undetermined. The fundamental purpose for determining the manner of death is for public health surveillance and vital statistics.

- **Natural** — are due solely or nearly totally to disease and/or the aging process.
- **Accident** — applies when an injury or poisoning (such as a drug overdose) causes death and there is little or no evidence that the injury or poisoning occurred with intent to harm or cause death. In essence, the fatal outcome was unintentional.
- **Suicide** — results from an injury or poisoning as a result of an intentional, self-inflicted act.
- **Homicide** — occurs when the death results from a volitional act committed by another person to cause fear, harm, or death. Intent to cause death is a common element but is not required for classification as a homicide. It must be emphasized that the classification of homicide for the purpose of death certification is a “neutral” term and neither indicates nor implies criminal intent, which remains a determination within the province of legal processes.
- **Undetermined** — is a classification used when the information pointing to one manner of death is no more compelling than one or more other competing manners of death, in thorough consideration of all available information.

In general, when death involves a combination of natural processes and external factors, such as injury or poisoning, preference is given to the non-natural manner of death.

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## Case Management

A Medicolegal Death Investigator (MDI) responds to nearly all of the death scenes within the counties we serve as Medical Examiner. They gather information, apply office policies, and consult with the Medical Examiner.

- The MDI is trained to recognize the vast majority of the deaths requiring postmortem examinations and, in those cases, immediately arranges for transport to WLJFC for a postmortem examination. Homicides, infant deaths, suicides and drug overdoses are examples of the deaths that are immediately sent.



- The MDI writes a report documenting their findings and uploads images obtained at the investigation. These reports and photos are reviewed by the Medical Examiner or deputy Medical Examiner.

The Medical Examiner or a deputy Medical Examiner is assigned to each case and generally uses one of the following approaches in each of the deaths for which our office is responsible:

- **Jurisdiction Declined** – A reported death classified as an attended natural death should be documented as a Declined Jurisdiction case. The body is released directly from the scene or hospital to the funeral home. The MDI views the body and collects information including scene circumstances, medical history, and social history. This information is provided to the on-call Medical Examiner who may decide to release a body directly to the funeral home chosen by the family.
  - **Storage** – Jurisdiction has been declined, but the body will be taken to WLJFC for temporary storage until a funeral home has been chosen. If the family cannot be found or if the family does not assume responsibility for the disposition of the remains, an unclaimed remains process ensues.
  - **External Examination** – An external examination includes a careful evaluation of the circumstances of the death and an examination of the external surfaces of the body, with possible laboratory/toxicology testing. This includes the production of a written report.
  - **Record Review** – A record review is a case where the Medical Examiner accepts jurisdiction and will sign the death certificate, but the body is not viewed by the Medical Examiner; therefore, a report of examination is not completed. This type of case review is done when a decedent has been hospitalized for a period of time following an injury (typically falls in the elderly) and lethal injuries have been sufficiently documented.
  - **Complete Autopsy** – A complete autopsy includes external and internal examination, plus toxicology. This includes the production of a written report.
  - **Limited autopsy** – A partial autopsy includes external and limited internal examination, plus toxicology at the discretion of the pathologist. This includes the production of a written report.
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## Cremation Permit Authorization

Tennessee state law requires funeral directors and embalmers to obtain a signed permit from the Medical Examiner for the county in which the death occurred. Our office reviews hundreds of cremation permit requests each year. The request for authorization to cremate involves reviewing the death certificate provided by the funeral director to assure that deaths that should have been reported to the office were, in fact, reported. Deaths that were not properly reported are investigated before cremation is authorized.

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## Public Health and Safety

The major purpose of the Medical Examiner's Office is to conduct death investigations. The information obtained from individual death investigations may also be studied collectively to gather information that may be used to address public health and safety issues. Our office participates with the Ballad Health M & M Review Board. We also participate in a child fatality review team, providing significant information regarding how children died with the goal of preventing future deaths.

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## Education

WLJFC is a division of East Tennessee State University, Quillen College of Medicine, Pathology Department. WLJFC pathologists hold faculty appointments with associated mentoring duties. Medical students, residents, and other students in advanced degree programs have the opportunity to complete elective rotations in the Medical Examiner's Office to gain experience and exposure to forensic pathology, forensic anthropology and medicolegal death investigation. The education of medical students and residents in the Medical Examiner's Office is provided with great attention to respect for the decedents and their families.

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## Medical Examiners/Forensic Pathologists

The William L. Jenkins Forensic Center physicians are Board Certified Forensic Pathologists who perform autopsies, compile reports of their findings and testify in criminal and civil court proceedings. They also educate medical students and residents and provide continuing education to death investigators and local law enforcement. They advance public health by providing information about emerging drug trends, infections and bioterrorism.

### **Emilie V. Cook, D.O.**

Forensic Pathologist, Director

Interim Chief Medical Examiner for Carter, Johnson, Unicoi and Washington Counties

### **Ami Murphy, D.O.**

Forensic Pathologist

Deputy County Medical Examiner for Carter, Johnson, Unicoi and Washington Counties

### **Andrea M. Orvik, M.D.**

Forensic Pathologist

Deputy County Medical Examiner for Carter, Johnson, Unicoi and Washington Counties

### **Ellen Wallen, M.D.**

Forensic Pathologist

Deputy County Medical Examiner for Carter, Johnson, Unicoi and Washington Counties

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## Medicolegal Death Investigators

The medicolegal death investigators are required to become certified by the American Board of Medicolegal Death Investigators (ABMDI). The Forensic Center employs five RFC Investigators, one is a Fellow and four are Diplomates with the ABMDI.

These staff members have an initial responsibility for accepting or declining jurisdiction for death cases reported to the RFC. If jurisdiction is accepted, MDIs are responsible for a variety of activities to assure the case is properly investigated.

### **Regional Forensic Center Medicolegal Death Investigators**

Kevin Brown, F-ABMDI  
Katrina Kokko, D-ABMDI  
Dean Petrone, D-ABMDI  
Laura Beth Scala, D-ABMDI  
Amber Zeigler, D-ABMDI

### **Field Medicolegal Death Investigators**

Carter County: Benny Colbaugh, Nathan Ward  
Johnson County: Willie Deboard  
Unicoi County: Jimmy Erwin

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## Autopsy Technicians

The Autopsy Technicians are responsible for assisting Forensic Pathologists in conducting autopsies and external examinations, including preparation of the body for autopsy, documenting personal property, forensic photography, performing radiologic imaging, evisceration; and working with funeral homes to transition the decedent for their final disposition.

Mark Dunn  
Savannah Collins  
Ariel Diaz  
Jasmyn Baumgardner

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## Administration

The Director of Operations is responsible to the Director of Forensic Pathology/Chief Medical Examiner for managing the operations of the William L. Jenkins Forensic Center, and supervises the investigative, technical, and administrative staff; ensuring the Forensic Center maintains accreditation. The Forensic Center Coordinator and Medical Program Facilitators are responsible for coordinating Forensic Pathologists' schedules for depositions and court testimony, medical billing, completing open records requests and assuring proper case closure, among other activities. They work with funeral homes, law enforcement, District Attorney's offices, attorneys, families, media, and others to ensure requested information is provided in a timely manner. The Forensic Center Coordinator and Medical Program Facilitators are also responsible for coordinating proper death certificate actions between the State of Tennessee Department of Vital Records, Funeral Homes, and the Regional Forensic Center.

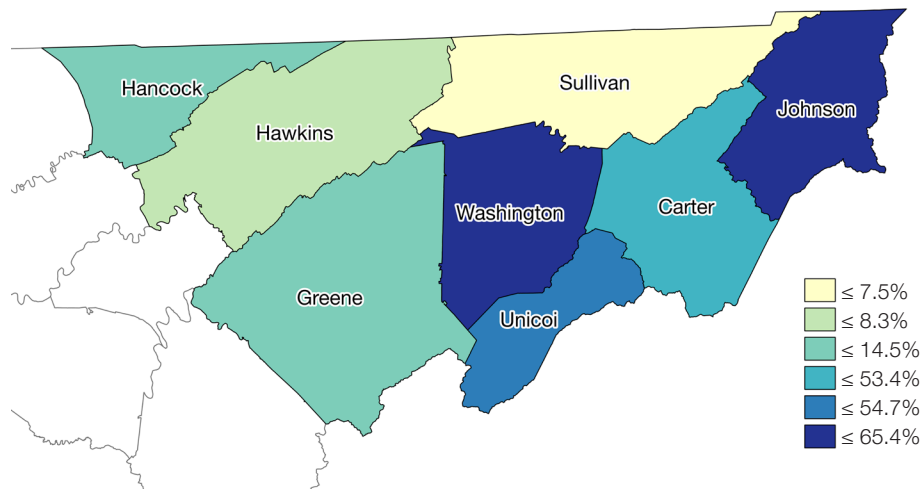
Laura Beth Parsons, F-ABMDI, Director of Operations  
Penny Rutledge, Forensic Center Coordinator  
Jennifer Poux, Medical Program Facilitator  
Miranda Roberts, Medical Program Facilitator

## II. Regional Forensic Center Case Counts

The estimated population of the eight counties served by WLJFC in 2023 was 531,841, according to the latest data provided by the US Census Bureau. As of May 6th, 2024, provisional statistical death data provided by the Tennessee Vital Statistics division at the TN Department of Health states that there have been 8,392 deaths in these same eight counties. Overall, therefore, the mortality rate in this region in 2023 was 1577.9 deaths per 100,000 residents.

There were 2,708 cases reported to WLJFC in 2023, suggesting that approximately 32.3% of deaths in the counties of service involved some interaction with the forensic center. This percentage varies widely by county; in particular, jurisdictional counties will have a higher reporting percentage than the non-jurisdictional counties. Recall from Section I that WLJFC performs multiple services for jurisdictional counties, including cremation permit authorization, investigations, as well as autopsy services; for non-jurisdictional counties, with some exceptions, WLJFC predominantly provides autopsy services only. As shown in Table 2.1, more than half of deaths in the jurisdictional counties were reported to the forensic center, but only around ten percent of deaths in non-jurisdictional counties were reported.

**Map 2.1 Percentage of Deaths Reported to RFC by County, 2023 (N = 2,708)**



**Table 2.1 Number of Cases Reported to RFC in 2023 (N = 2,708)**

	Total Population	Mortality Rate Per 100,000 Residents*	Total Provisional Death Count†	Deaths Reported to RFC
<b>Jurisdictional Counties</b>				
Carter	57,022	1113.6	635	339
Johnson	18,375	865.3	159	98
Unicoi	17,756	1368.6	243	133
Washington	138,420	1918.8	2656	1736
<b>Non-Jurisdictional Counties</b>				
Greene	72,577	1190.5	864	104
Hancock	6,956	891.3	62	9
Hawkins	58,600	965.9	566	47
Sullivan	162,135	1978.0	3207	242

\*Rates calculated by dividing death count by population and multiplying result by 100,000

† 2023 deaths calculated using provisional death file generated 6 May 2024

**Figure 2.1 Yearly RFC Case Percentage, 2018-2023**

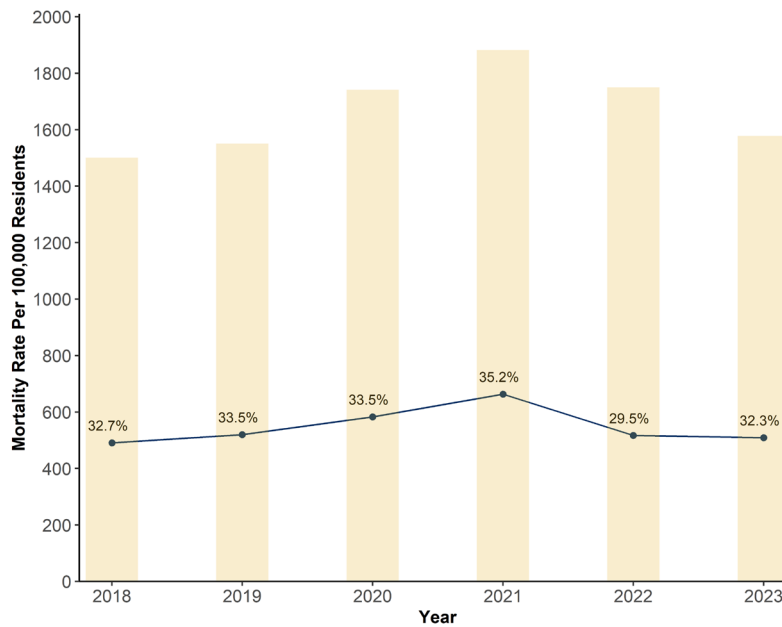


Figure 2.1 above shows how the percentage of deaths in the counties of service has fluctuated over time in comparison to the annual mortality rate in the region. From 2018 to 2021, the percentage of reported cases increased even in comparison to the mortality rate. From 2021 to 2022, the mortality rate decreased, as did the percentage of reported cases, but in our most recent year, we see that even though the overall rate dropped from 2022 to 2023, the percentage of cases reported to WLJFC increased.

Table 2.2 focuses on the 2,708 cases reported to the RFC by activity type (e.g., record review, complete autopsy) as described in the Case Management section above. For jurisdictional counties, 25.3% of reported cases are accepted for either autopsy or record review, 36.6% are cremation permit cases, and 38.1% are declined. For non-jurisdictional counties, only cases accepted for autopsy are included in the table, with the exception of cremation permits for one county, where WLJFC will sign the authorization if the Hancock County ME is unavailable<sup>1</sup>. Excluded counts are indicated with asterisks.

**Table 2.2 Activities Completed by WLJFC by County, 2023 (N = 2,708)**

	Cremation Permit*	Jurisdiction Declined	Jurisdiction Accepted				Total Number Reported to RFC
			Full Autopsy	External Exam	Limited Exam	Record Review	
<b>Jurisdictional Counties</b>							
Carter	136	108	59	26	3	7	339
Johnson	24	33	28	9	2	2	98
Unicoi	61	42	22	7	0	1	133
Washington	623	695	163	128	9	118	1736
<b>Non-Jurisdictional Counties</b>							
Greene	*	*	91	12	1	*	104
Hancock	1	*	8	0	0	*	9
Hawkins	*	*	33	12	2	*	47
Sullivan	*	*	212	30	0	*	242

\*Cremation permit counts are based on date of death of the decedent, not date permit was issued. This count therefore represents the number of 2023 deaths in each jurisdictional county that required a cremation permit.

<sup>1</sup> WLJFC staff does not complete all cases for non-jurisdictional counties in MDILog, the case management software; only cases accepted for autopsy or exam are filled out by RFC staff. Because of this, there are profound differences in how these cases are completed in the software, and to ensure proper classification of cases, this report excludes all non-jurisdictional county cases that are indicated as “jurisdiction declined,” “record review,” and all cremation permit authorizations that WLJFC staff did not directly complete.

**Figure 2.2 Activities Completed by WLJFC for Jurisdictional Counties, 2023 (N = 2,306)**

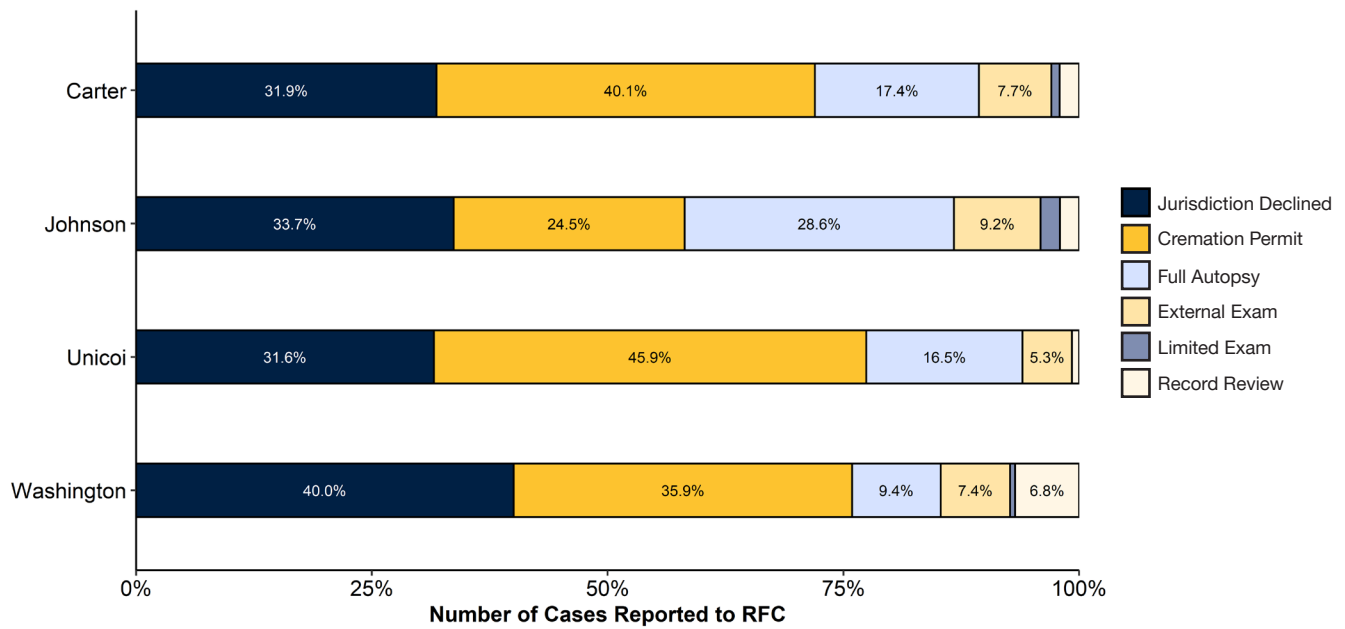
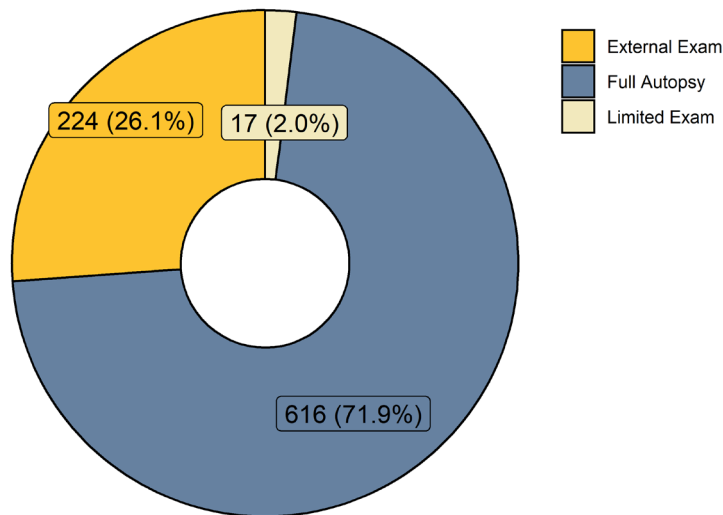


Figure 2.2 compares the distribution of activities performed for each jurisdictional county. It should be noted that these percentages must be considered in combination with Table 2.2 for full context. For example, a higher percentage of Johnson County RFC cases (33.7%) were declined compared to Carter County (31.9%), but the overall number of Carter County cases is more than three times higher than the total number of Johnson County cases, so there were many more cases in Carter where jurisdiction was declined compared to Johnson. We present the table beside the figure so that the reader may examine the data from multiple viewpoints.

Figure 2.3 shows the percentages of the full autopsies, limited exams, and external exams conducted in 2023. Overall, there were 857 autopsies or exams performed, 71.9% of which were full autopsies, 26.1% were external exams, and 2.0% were limited exams.

**Figure 2.3 Autopsies and Exams Performed at WLJFC, 2023 (N = 857)**



To conclude this section, we turn our attention to the manners of death for the 985 cases where jurisdiction was accepted (JA). Table 2.3 shows the manners of death by county for these cases. While different counties have slightly different distributions, they are similar enough that it makes sense to consider the manners of death in aggregate. Figure 2.4 on the next page compares this overall distribution (shown in 4a) with the various counties by jurisdiction (jurisdictional counties shown in 4b and non-jurisdictional counties shown in 2.4c). Due to the interest in drug-related deaths, as well as deaths due to motor vehicle accidents (MVA), these cases are shown separately from all other accidental deaths. Note in Figure 2.4b and 2.4c that the shaded bars follow the same order as the columns in Table 2.3 to make interpreting the percentages more straightforward.

**Table 2.3 Manners of Death for Jurisdiction-Accepted Cases by County, 2023 (N = 985)**

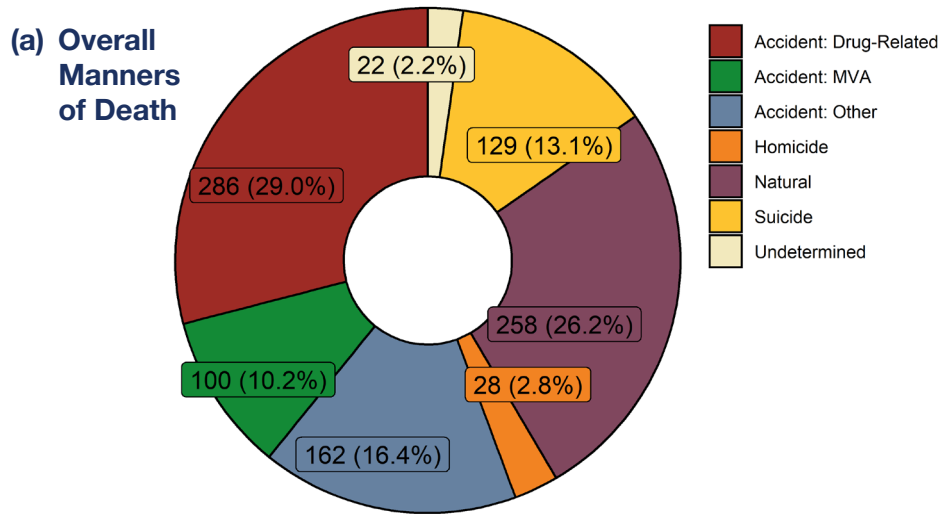
	Accident: Drug-Related	Accident: MVA	Accident: Other	Homicide	Suicide	Undetermined	Natural	Total Accepted
<b>Jurisdictional Counties</b>								
Carter	31	9	6	2	12	3	32	95
Johnson	10	3	2	1	10	2	13	41
Unicoi	4	1	2	0	7	3	13	30
Washington	78	59	132	12	29	6	102	418
<b>Non-Jurisdictional Counties</b>								
Greene	42	14	4	2	20	2	20	104
Hancock	5	0	0	0	0	1	2	8
Hawkins	9	4	5	3	11	2	13	47
Sullivan	107	10	11	8	40	3	63	242

Overall, accidental deaths accounted for about half (55.6%) of all JA cases, with drug-related deaths being 29.0% of all JA cases and MVA deaths being 10.2% of JA cases. Natural deaths were 26.2% of JA cases, with suicide deaths accounting for 13.1%, homicide deaths accounting for 2.8%, and deaths due to undetermined intent accounting for the remaining 2.2%.

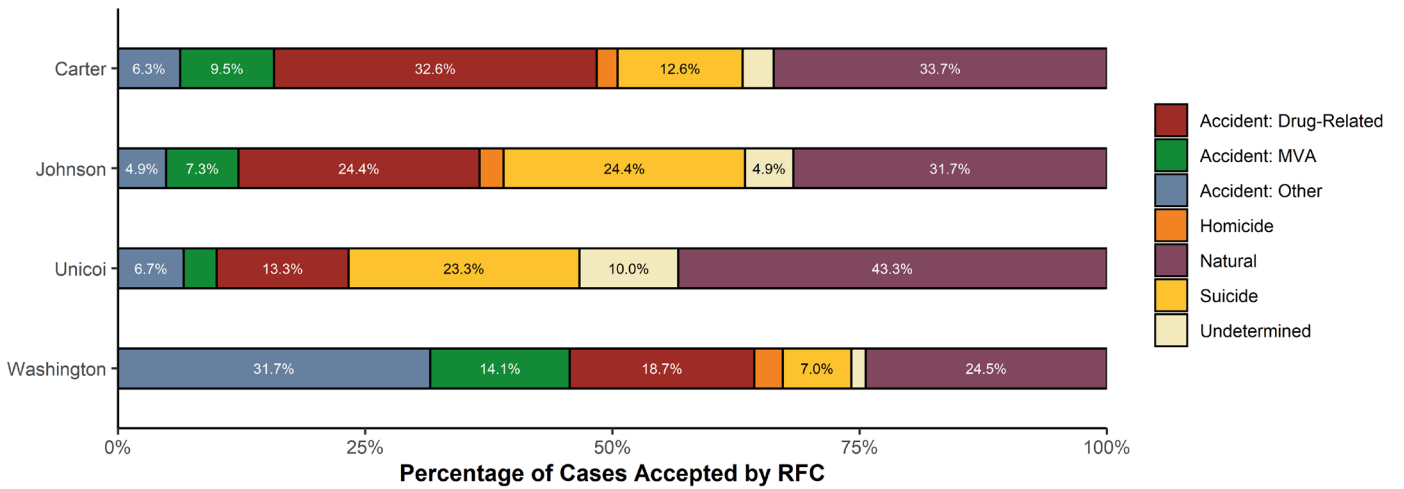
For Greene and Sullivan Counties, the highest percentage of deaths were drug-related accidental deaths. For Washington County, the highest percentage of deaths were non-drug or MVA accidental deaths. For Carter, Johnson, Unicoi, and Hawkins Counties, the highest percentage of deaths were natural deaths. Additional details of all of these manners of death are provided in separate sections of this report.

For Hancock County, it should be noted that the counts in each category were so low that they are not statistically different from zero in any category, implying that one should not attempt to draw any conclusions from these counts. It is never recommended to infer information from statistics performed on small counts like these. We present these results only for completeness.

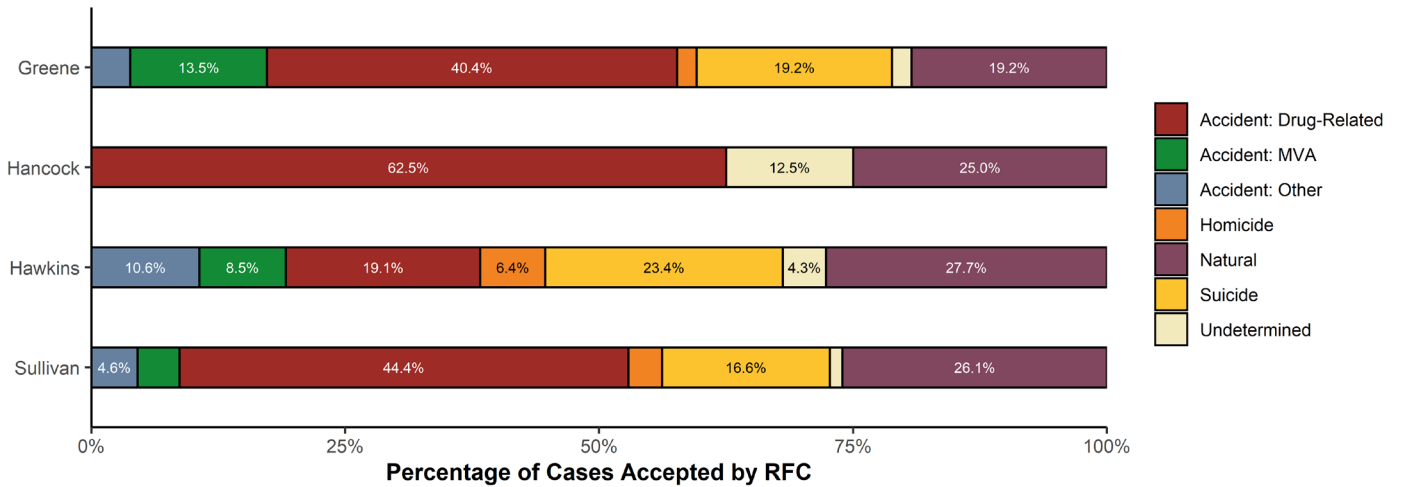
Figure 2.4 Manners of Death for JA Cases, 2023 (N = 985)



(b) Manners of Death by Jurisdictional County



(c) Manners of Death by Non-Jurisdictional County





To conclude this section, we look at the demographics (age, sex, race/ethnicity) of the JA cases for 2023. Table 2.4 shows the sex of JA cases by county. Overall, 67.3% of cases were male decedents, and 32.6% were female. One case is not included in the table; due to complexities in the circumstances of the case, decedent sex could not be determined.

Figure 2.5 shows the age distribution by sex; we can see a slight bimodality in the distribution for male decedents here. The largest number of deaths occurs in the 55-64 year group, but additionally, we can see that for females, all year groups from age 35 to 64 years old are approximately equal.

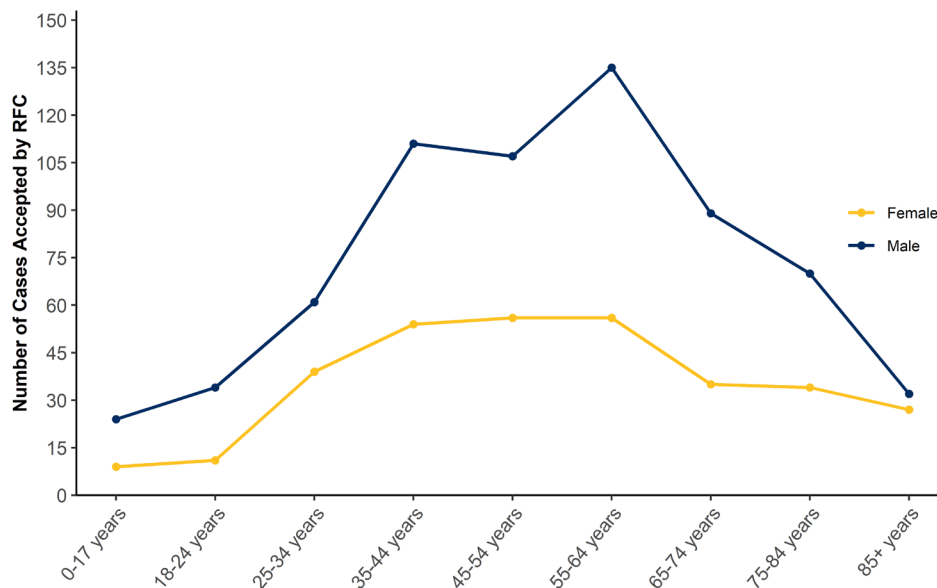
We also note that due to the social differences between adolescents and young adults, we do not present age data stratified by the usual deciles (15 to 24 years) and instead separate these into children/adolescents (0 to 17 years) and young adults (18-24 years). This grouping will be observed in all age graphs presented throughout this report. In Section IX, where pediatric deaths are discussed in detail, the 0-17 year group will be further stratified.

**Table 2.4 Sex of Jurisdiction-Accepted Decedents by County, 2023 (N = 985)**

Jurisdictional Counties	Male		Female		Total Accepted
	Count	Percent	Count	Percent	
Carter	73	76.8	22	23.2	95
Johnson	33	80.5	8	19.5	41
Unicoi	19	63.3	11	36.7	30
Washington	273	65.3	145	34.7	418
<b>Non-Jurisdictional Counties</b>					
Greene	67	64.4	36	34.6	104*
Hancock	4	50.0	4	50.0	8
Hawkins	35	74.5	12	25.5	47
Sullivan	159	65.7	83	34.3	242

\*One decedent not included in sex counts; due to complex circumstances, decedent sex could not be determined

**Figure 2.5 Age at Death by Sex for Jurisdiction-Accepted Decedents, 2023 (N = 985)**



**Table 2.5 Race and Ethnicity of Jurisdiction-Accepted Decedents by County, 2023 (N = 985)**

	Black or African American, non-Hispanic	White, non-Hispanic	American Indian or Alaskan Native	Asian	Other, non-Hispanic	Any Race, Hispanic	Unspecified Race and Ethnicity	Total Accepted
<b>Jurisdictional Counties</b>								
Carter	5	89	0	0	0	1	0	95
Johnson	2	39	0	0	0	0	0	41
Unicoi	0	29	0	1	0	0	0	30
Washington	15	397	0	1	0	5	0	418
<b>Non-Jurisdictional Counties</b>								
Greene	4	97	1	0	0	1	1	104
Hancock	0	8	0	0	0	0	0	8
Hawkins	0	46	0	0	0	1	0	47
Sullivan	8	227	1	0	1	5	0	242

**Figure 2.6 Race and Ethnicity of Jurisdiction-Accepted Decedents, 2023 (N = 985)**

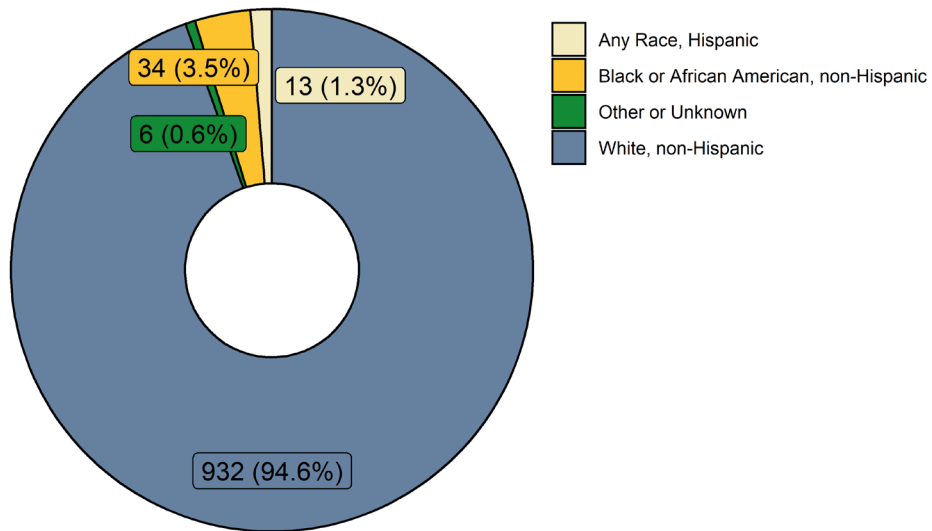


Table 2.5 and Figure 2.6 display information about the race and ethnicity; 94.6% of decedents were white, non-Hispanic and 3.5% of decedents were non-Hispanic black or African American. Less than two percent of decedents were of Hispanic ethnicity or were described as a race other than white or black. In Table 2.5, we can see that this distribution is relatively consistent across all eight counties of service.

### III. Homicide Demographics

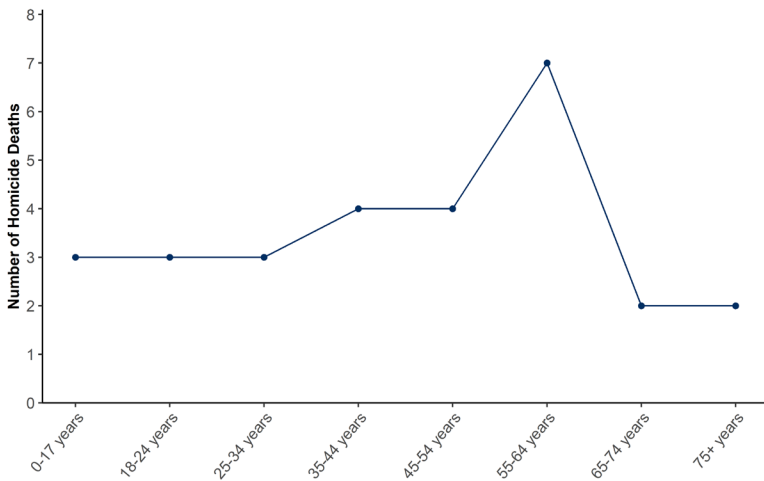
In 2023, there were 28 homicides reported to the forensic center. Fifteen of them occurred in jurisdictional counties, and the remaining thirteen occurred in non-jurisdictional counties (refer to Table 2.3 in the previous section for the by-county counts). In this section, we will present information about sex, age, race and ethnicity, mechanism of death, and geographic data.

Twenty of the decedents were male, and 8 were female. The youngest male decedent was 17 years old, and the youngest female decedent was 3 years old. The racial distribution was similar for both sexes, although we note that the counts are too small to be stable enough for interpretation. We list these counts here because the small numbers make it difficult to generate meaningful sex-specific tables or figures. We will separate mechanism of death by sex in Table 3.1.

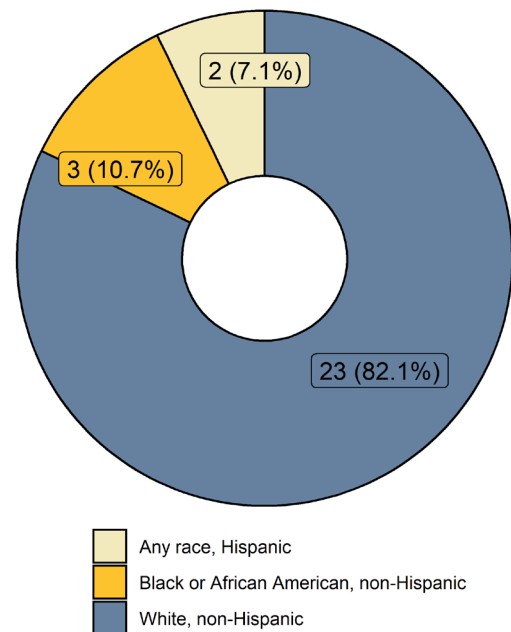
Figure 3.1 below shows the age distribution of homicide deaths. We again note here that due to the social differences between adolescents and young adults, we do not present age data stratified by the usual deciles (15 to 24 years) and instead separate these into children/adolescents (0 to 17 years) and young adults (18 to 24 years). We see in this plot that the largest number of homicide victims were between 55 and 64 years old.

Figure 3.2 below shows the race and ethnicity of homicide deaths. The majority of victims were white, non-Hispanic.

**Figure 3.1 Homicide Counts by Age, 2023 (N = 28)**



**Figure 3.2 Race\Ethnicity of Homicides, 2023 (N = 28)**



- Any race, Hispanic
- Black or African American, non-Hispanic
- White, non-Hispanic

**Table 3.1 Homicides by Mechanism of Death by Sex, 2023 (N = 28)**

	Male		Female	
	Count	Percent	Count	Percent
Asphyxia	0	0	2	25.0
Blunt Force	3	15.0	3	37.5
Firearm	14	70.0	3	37.5
Physical Assault	1	5.0	0	0
Sharp Instrument	2	10.0	0	0
<b>Total</b>	<b>20</b>		<b>8</b>	

Table 3.1 above shows the mechanism of death by sex for homicide deaths. The most common mechanism was firearm; 17 (60.7%) victims died by firearm. No other category had a count higher than five.

The case management system allows investigators and pathologists to enter weapon information for firearm deaths. For 58.8% of firearm homicides, weapon type was able to be specified. In the majority of these deaths, the weapon was a handgun. For an additional 35.3% of firearm homicides, the weapon type was listed by the investigator or pathologist as ‘Unknown.’

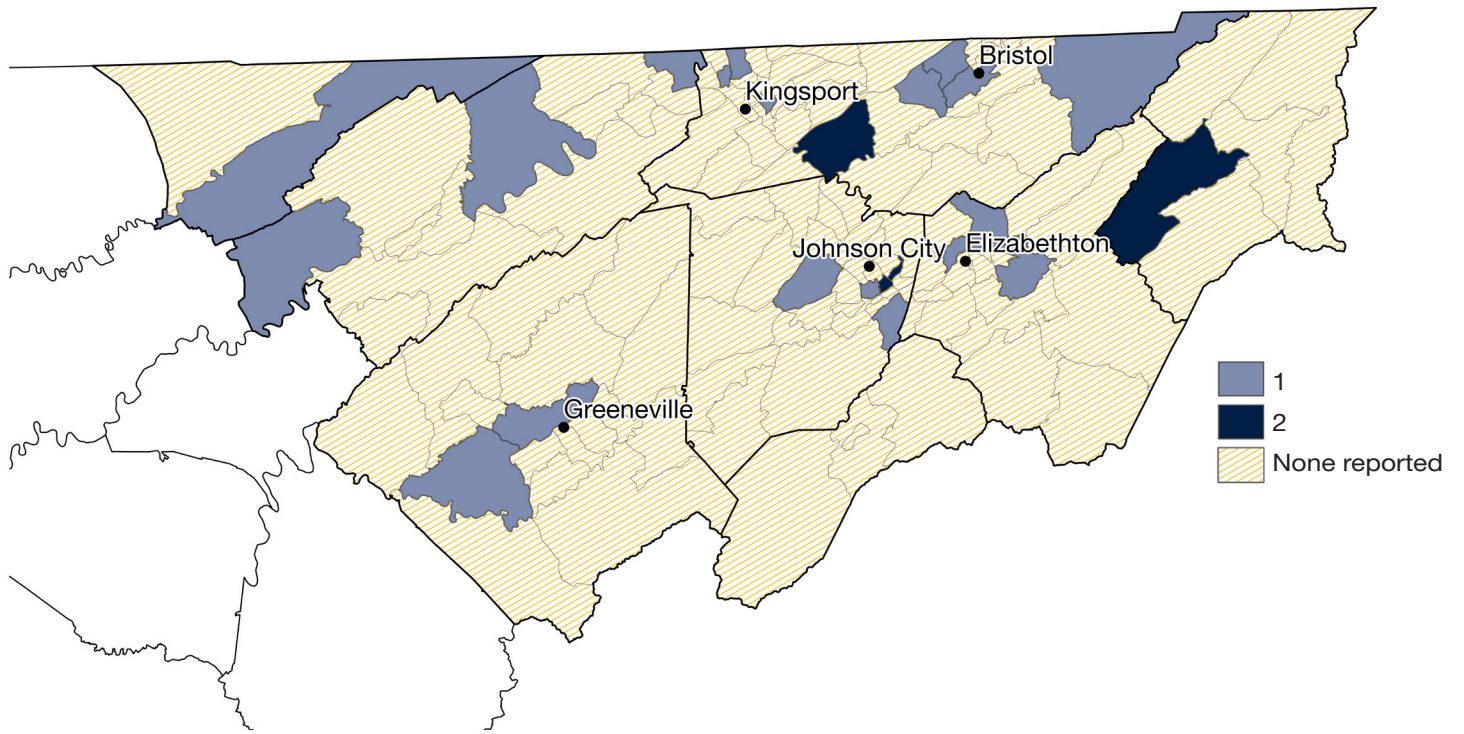
To examine geographical trends, we first geocoded the address information of the location of injury associated with the homicide. This injury location was not necessarily within the service area of WLJFC; the county of service may be the county where injury occurred, where death occurred, or both. For example, if a decedent was injured across the state line, but transported to the trauma center in Johnson City, where they died of their injuries, it is likely that WLJFC will investigate and subsequently accept jurisdiction. To generate a readable map, we elected only to show cases where the injury location was within the service counties of the forensic center. City centers are also shown to help orient the viewer.

We then decided to represent the injury location on our map by using census tracts<sup>1</sup>. Broadly speaking, a census tract is a small area within a county used by the US Census Bureau and other such entities for a variety of purposes. Census tracts are designed to be relatively homogeneous in population and for the population size between tracts to be relatively comparable. Unlike zip codes, census tracts are contained completely within single counties, and they can be more consistently linked to public health indices such as SDI (the supplemental demographic index) for geospatial analysis. Additionally, from the 2000 Census forward, census tracts completely cover the entire geography of the United States, meaning that there are no coordinates that cannot be mapped to a census tract.

Map 3.1 shows the number of homicide deaths with an injury in each census tract for the service area of WLJFC. In the areas shaded in lighter blue, there was one homicide injury. In the areas shaded darker blue, there were two homicide injuries. In the areas shaded yellow, there were no homicide injuries reported. The outlines of the census regions are shown in light grey for comparison to county lines shown in black.

<sup>1</sup> <https://www.census.gov/data/academy/data-gems/2018/tract.html>

Map 3.1 Injury Locations of Homicide Deaths, 2023 (N = 28)



## IV. Suicide Demographics

In 2023, there were 129 suicides reported to the forensic center. Fifty-eight of them (45.0%) occurred in jurisdictional counties, and the remaining 71 (55.0%) occurred in non-jurisdictional counties (refer to Table 2.3 for the by-county counts). In this section, we will present information about sex, age, race and ethnicity, and mechanism of death.

Ninety-nine of the decedents (76.7%) were male and 30 (23.3%) were female. Figure 4.1 below shows the age distribution of suicide deaths by sex. While the average age at death was similar for males and females, males had a wider age distribution and from the figure, we can see a potential bimodal trend among males. Fewer than ten decedents were under the age of 18, with the youngest being 14.

**Figure 4.1 Age Distribution of Deaths due to Suicide by Sex, 2023 (N = 129)**

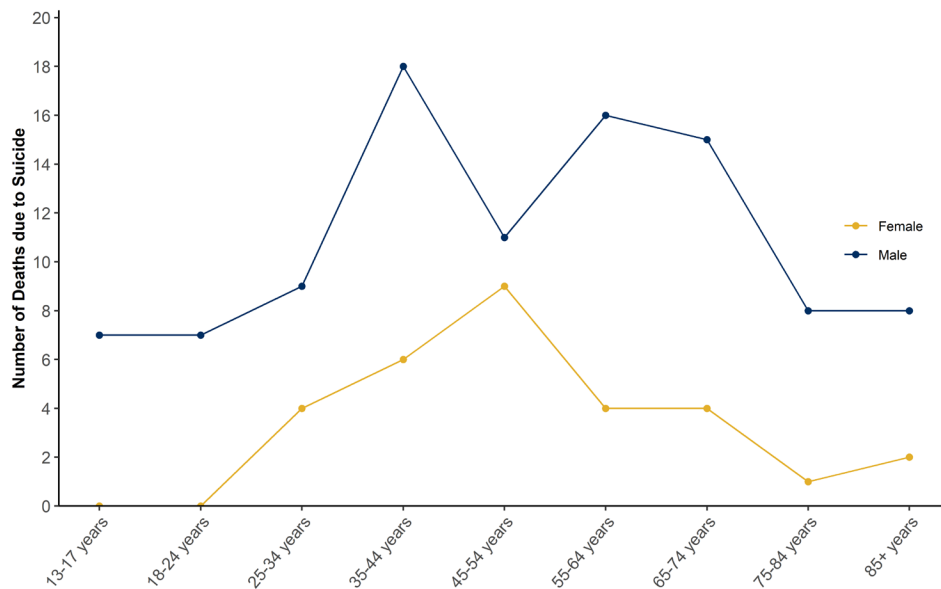
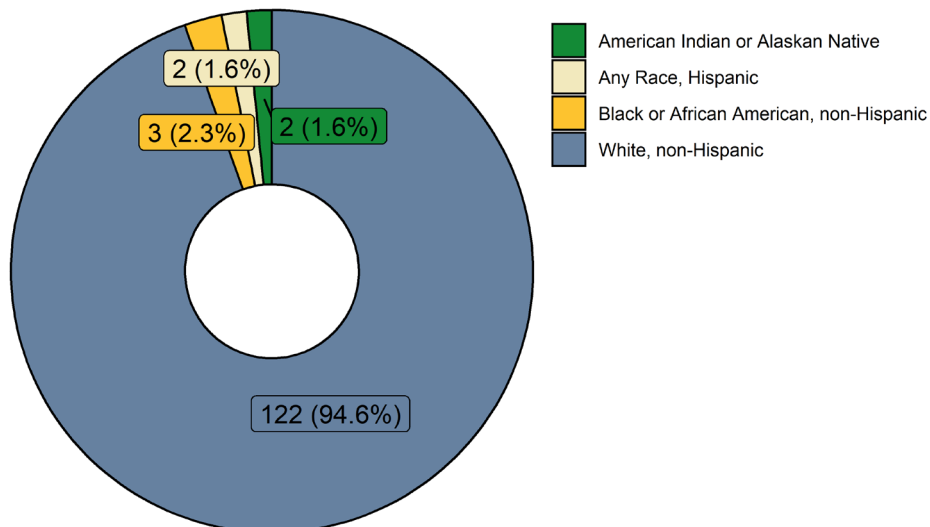


Figure 4.2 below shows the race and ethnicity distribution of individuals who died by suicide. Almost ninety-five percent (94.6%) of decedents were white, non-Hispanic.

**Figure 4.2 Race and Ethnicity of Deaths due to Suicide, 2023 (N = 129)**

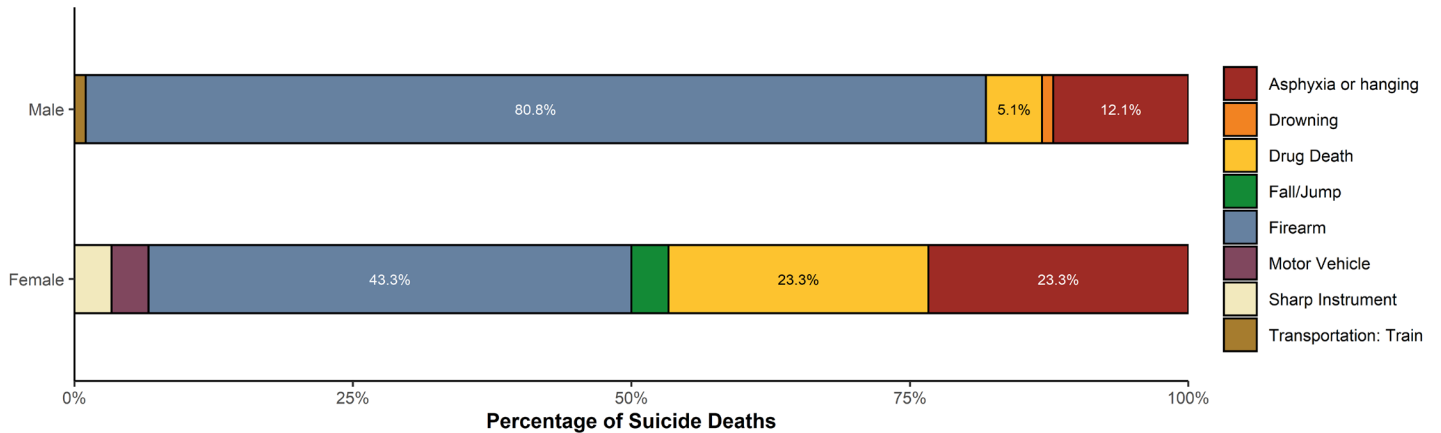


We now examine the mechanism of death in Table 4.1 and Figure 4.3, which both show the counts by mechanism by sex. A higher percentage of males died due to firearm than females, and a higher percentage of females died due to drug overdose or hanging than males. The remaining counts are too small to attempt to attribute to a statistical trend. The counts are shown in Table 4.1, and the corresponding distribution is shown in Figure 4.3.

**Table 4.1 Suicide Counts by Mechanism of Death by Sex, 2023 (N = 129)**

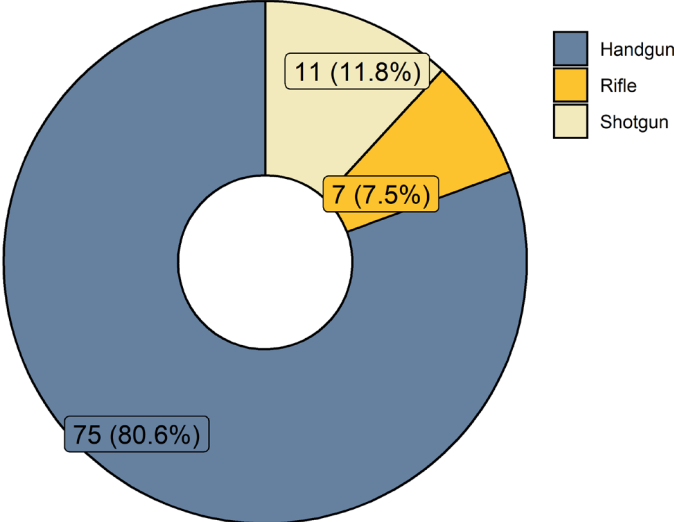
	Male		Female	
	Count	Percent	Count	Percent
Asphyxia or hanging	12	12.1	7	23.3
Drowning	1	1.0	0	0
Drug death	5	5.1	7	23.3
Fall/Jump	0	0	1	3.3
Firearm	80	80.8	13	43.3
Motor vehicle	0	0	1	3.3
Sharp instrument	0	0	1	3.3
Transportation: Train	1	1.0	0	0
<b>Total</b>	<b>99</b>		<b>30</b>	

**Figure 4.3 Suicide Counts by Mechanism of Death by Sex, 2023 (N = 129)**



As stated in the previous section, certifiers are able to enter firearm information into the system when available for analysis. For 80.6% of the 93 suicide deaths due to firearm in 2023, the weapon type specified was a handgun. In 11.8% of firearm suicide deaths, the weapon type was a shotgun, and in the remaining 7.5%, the weapon type was a rifle. Figure 4.4 on the following page shows this distribution.

Figure 4.4 Weapon Type Identified in Firearm Suicide Deaths, 2023 (N = 93)





## V. Accidental Death Demographics

In 2023, there were 548 accidental deaths reported to the forensic center. The majority of them (337 cases, 61.5%) occurred in jurisdictional counties, and the remaining 211 (38.5%) occurred in non-jurisdictional counties. As in the previous section, we will present information about demographics and the mechanism of death. We will also focus on deaths attributed to motor vehicle accidents (MVA), as those are often of particular concern. Drug-related deaths are addressed in more detail in Section VIII.

About two-thirds (66.8%) of these decedents were male, and 33.2% were female. Figure 5.1 shows the age distribution of these decedents by sex. There is potentially some bimodality in the distribution for both sexes; however, there are some distribution differences in the earlier years. The maximum in both trendlines occurs at 35-44 years.

**Figure 5.1 Accidental Death Counts by Sex, 2023 (N = 548)**

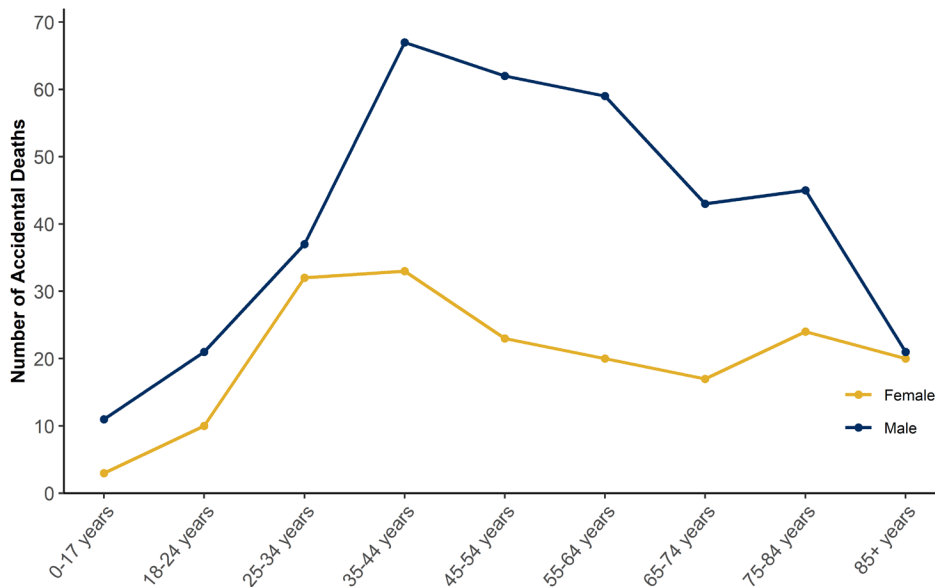
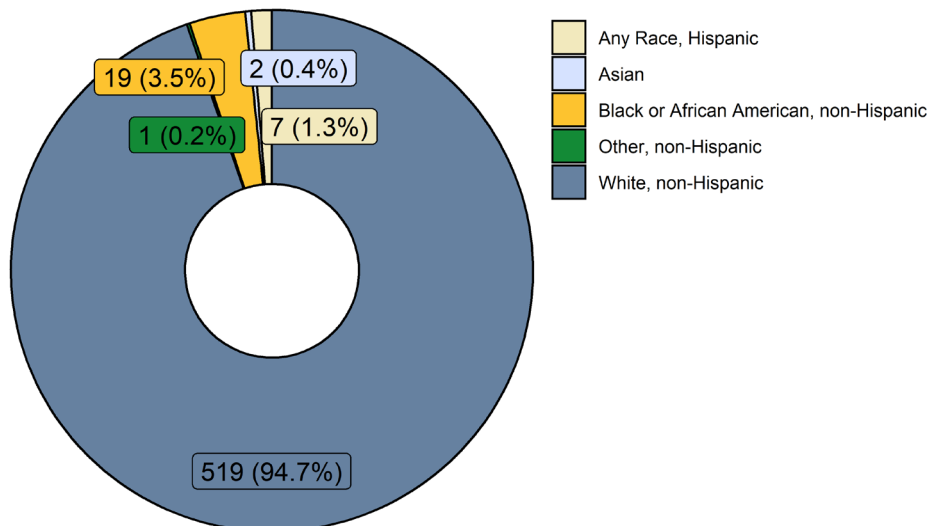


Figure 5.2 below shows the race and ethnicity distribution of these decedents. Almost ninety-five percent (94.7%) of decedents were white, non-Hispanic.

**Figure 5.2 Race and Ethnicity of Accidental Deaths, 2023 (N = 548)**



We now examine the mechanism of death in Table 5.1 and Figure 5.3, which both show counts by mechanism of death by sex. For male decedents, the most common mechanisms are drug death (51.6%), motor vehicle collisions (21.3%), and falls for individuals aged 65 and older (15.8%). For female decedents, the majority of accidental deaths are drug deaths (53.3%), falls for individuals aged 65 and older (24.7%), or motor vehicle collisions (12.1%).

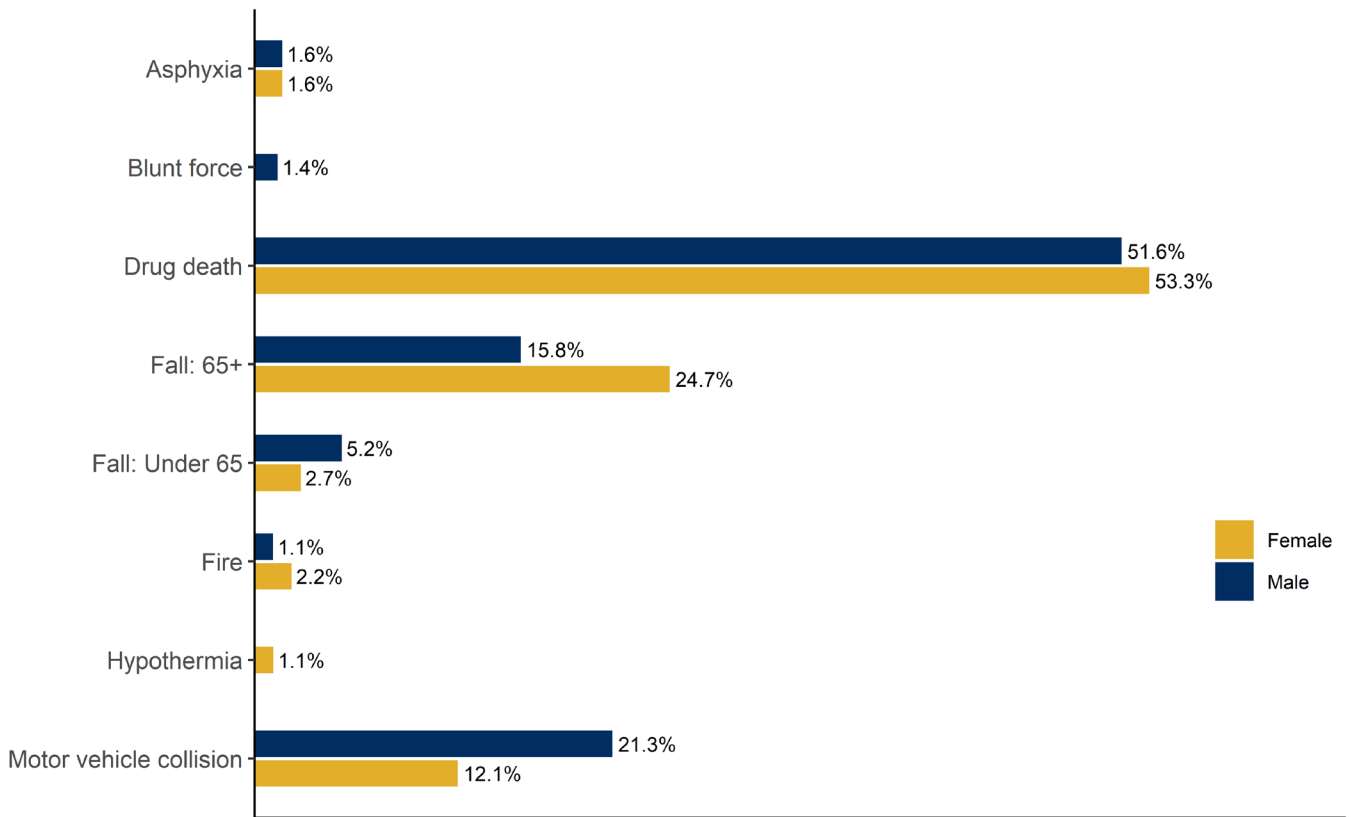
It should be noted that mechanisms where the total count is less than ten have too small a number to infer any trend; the statistical error is very high for small counts. Mechanisms with a percentage less than one are not shown on Figure 5.3.

**Table 5.1 Accidental Deaths by Mechanism by Sex, 2023 (N = 548)**

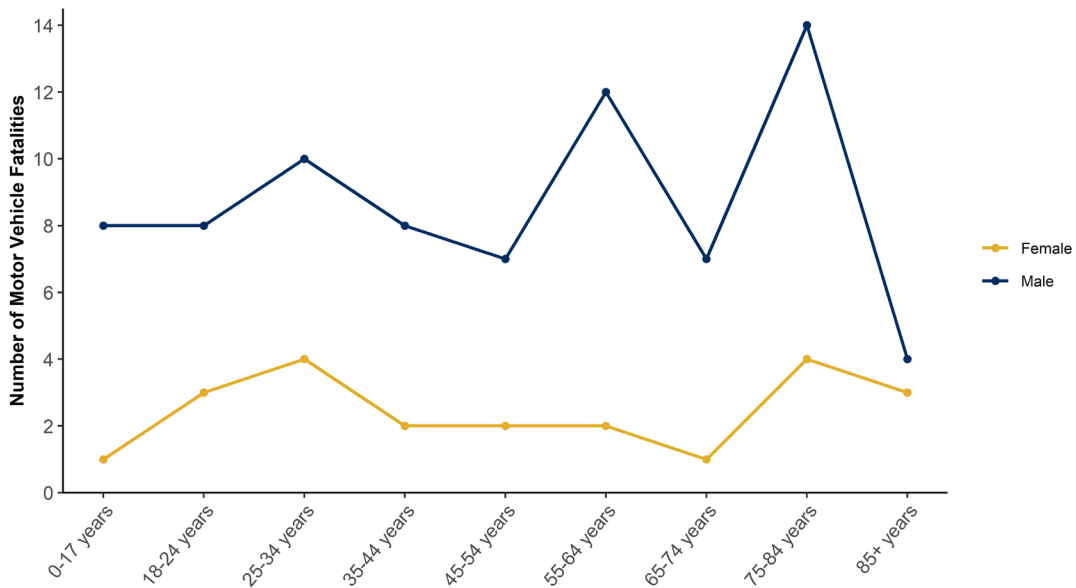
	Male		Female	
	Count	Percent	Count	Percent
Anaphylaxis	0	0.0	1	0.5
Asphyxia	6	1.6	3	1.6
Blunt force	5	1.4	1	0.5
Burn: Thermal, not fire	1	0.3	0	0.0
Carbon monoxide	2	0.5	0	0.0
Chronic alcoholism	1	0.3	0	0.0
Drug death	189	51.6	97	53.3
Electrical	1	0.3	0	0.0
Fall: 65+	58	15.8	45	24.7
Fall: Under 65	19	5.2	5	2.7
Fire	4	1.1	4	2.2
Firearm	1	0.3	1	0.5
Hypothermia	0	0.0	2	1.1
Infection	1	0.3	0	0.0
Ingestion of foreign body	0	0.0	1	0.5
Motor vehicle collision	78	21.3	22	12.1
<b>Total</b>	<b>366</b>		<b>182</b>	

We will now turn our attention to the 100 decedents listed as dying due to an incident involving a motor vehicle of some kind. Figure 5.4 shows the age distribution of these decedents by sex. This distribution is relatively flat; the majority of age groups have fewer than ten decedents, and the small variations that appear in the figure look more substantial than they actually are due to small counts.

**Figure 5.3 Accidental Deaths by Mechanism by Sex, 2023 (N = 548)**



**Figure 5.4 Motor Vehicle Accident Deaths by Age by Sex, 2023 (N = 100)**



**Figure 5.5 Race and Ethnicity of Motor Vehicle Accident Decedents, 2023 (N = 100)**

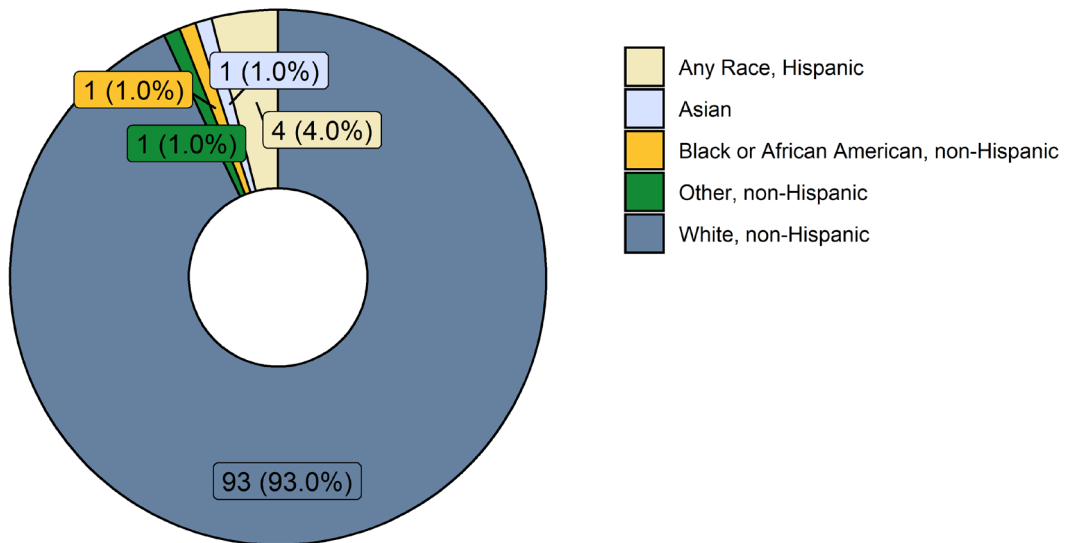
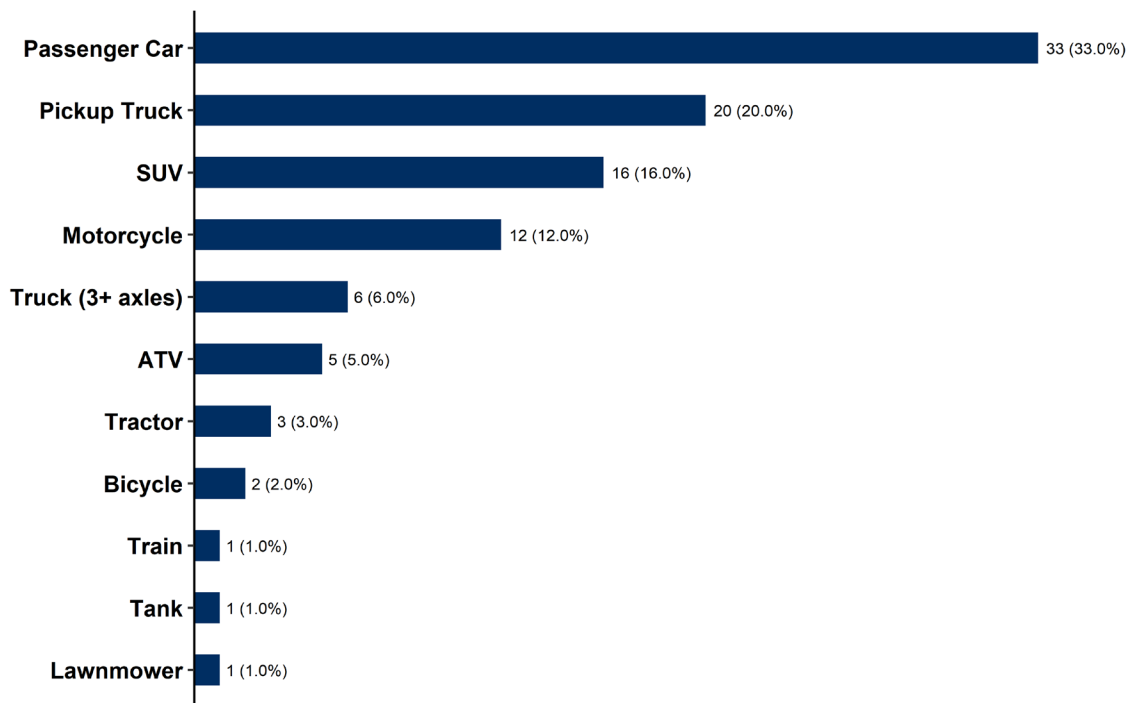


Figure 5.5 shows the race and ethnicity of decedents involved in motor vehicle accidents. A lower proportion of MVA decedents were non-Hispanic black or African American compared to the percentage of overall deaths – only 1.0% of MVA decedents were non-Hispanic black or African American, compared to 3.5% of overall accidental deaths. All other groups are approximately in the same proportion as the overall accidental deaths shown in Figure 5.2.

Figure 5.6 shows the information available about the type of vehicle involved in the incident. The most common vehicle was a passenger car (33.0%), followed by a pickup truck (20.0%).

**Figure 5.6 Vehicle Type in MVA Deaths, 2023 (N = 100)**



**Figure 5.7 Decedent Position in Motor Vehicle Incidents, 2023 (N = 100)**

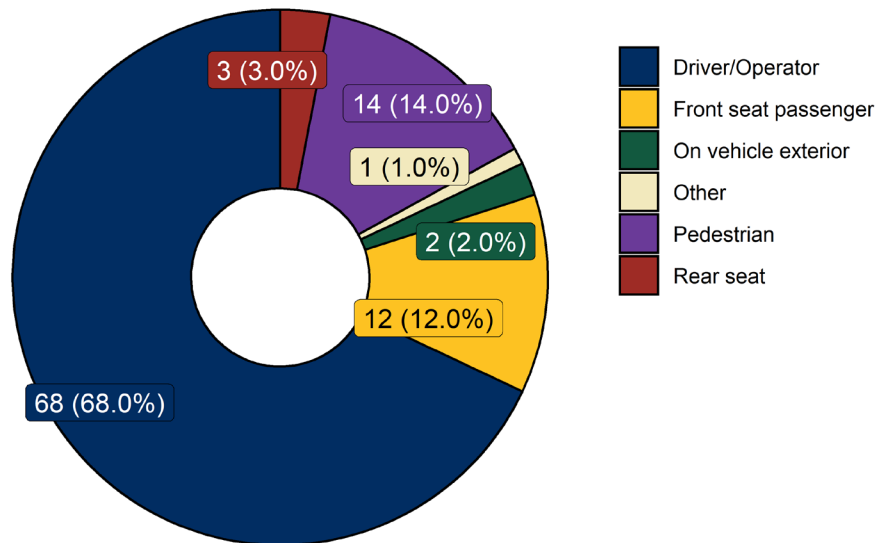
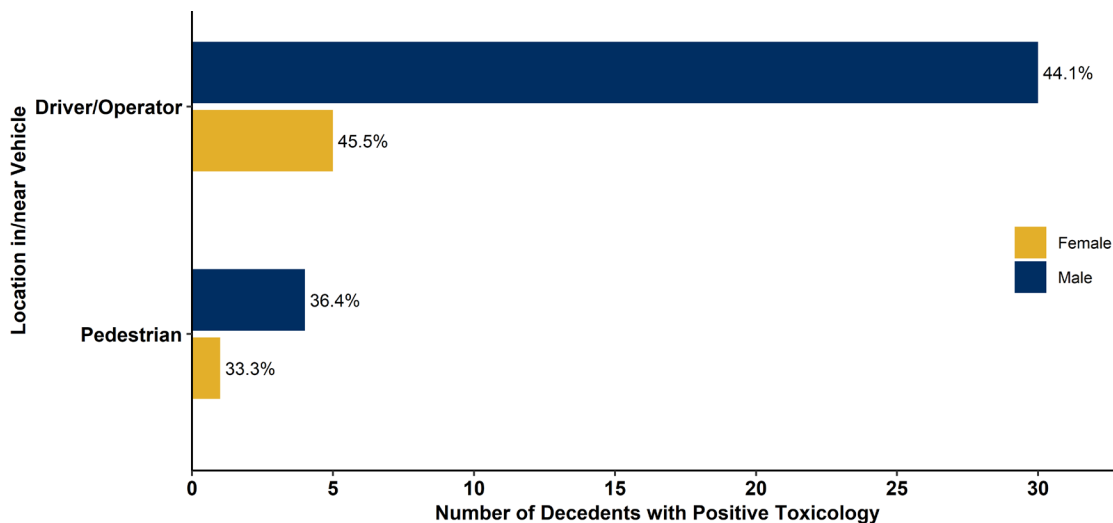


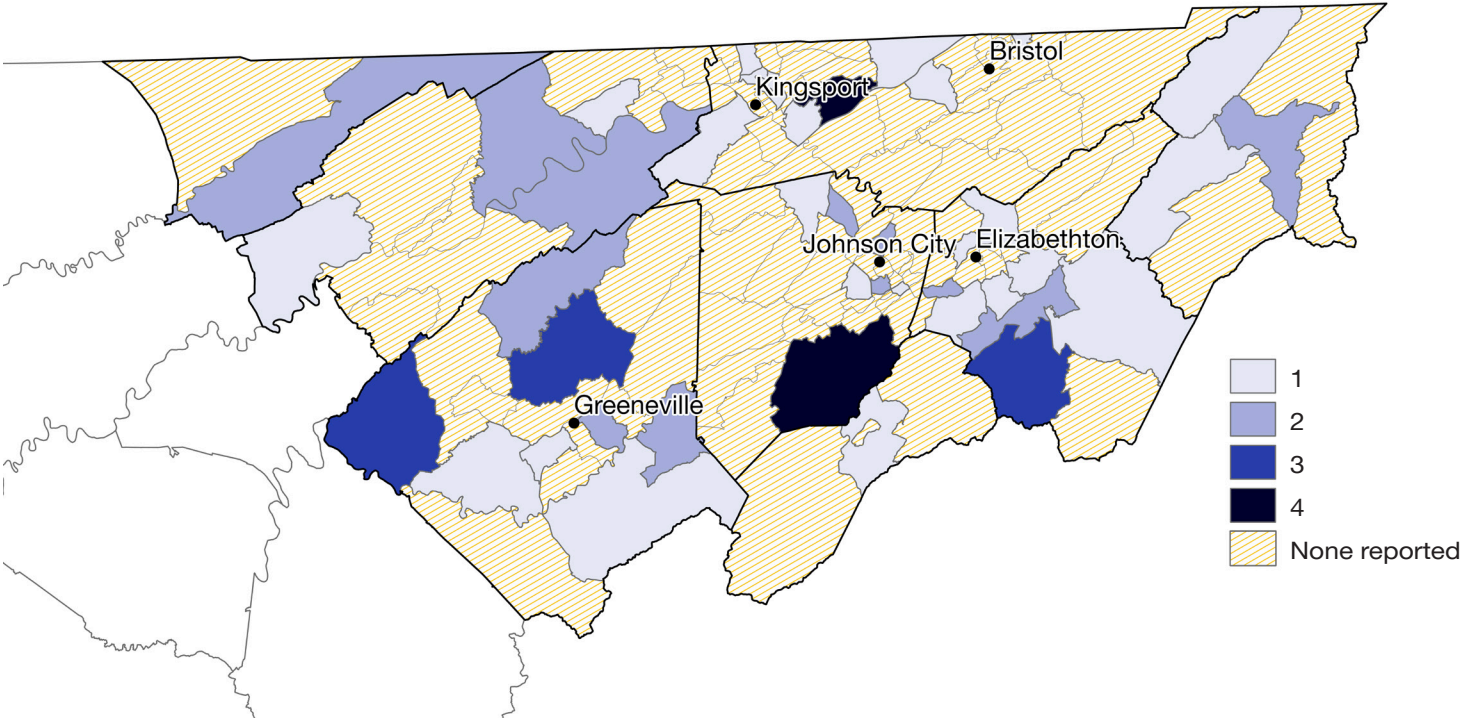
Figure 5.8 shows the counts and percentages of MVA deaths considered to involve drugs or alcohol. Decedents were identified using toxicology results; if a decedent had positive toxicology for substances such as alcohol, recreational drugs, or prescription medications that can cause impairment, they were flagged in this category. It is important to note, however, that the amount of substance was not considered. Determining impairment based on toxicology is extremely complex and depends on a large number of factors. We want to be clear that Figure 5.8 only shows the number of decedents with positive toxicology, and this does not necessarily indicate or exclude impairment.

The percentages of male and female drivers or operators with positive toxicology are similar. About forty-four percent (44.1%) of males and 45.5% of females had positive toxicology. The percentages of male and female decedents identified as pedestrians are also relatively similar – 36.4% of male pedestrians and 33.3% of female pedestrians. It is important to note that the overall number of female decedents with positive toxicology is fewer than ten, so these counts are not stable.

**Figure 5.8 MVA Deaths With Positive Toxicology by Sex, 2023**



**Map 5.1 Injury Location of Motor Vehicle Deaths, 2023 (N = 77)**



Map 5.1 uses the same methodology described in Section III to display the injury location by census tract for MVA where the address could be geocoded within WLJFC’s service area. Twenty-three decedents either had injury locations out-of-state, in Tennessee but not in the service area, or injury location was unknown. City centers are also shown to help orient the viewer. Census tracts are shaded blue according to the number of decedents per area: lightest blue areas had one decedent and darkest blue had four decedents. Tracts with no reported injuries are shaded in yellow.

## VI. Natural Death Demographics

In 2023, there were 258 natural deaths reported to the forensic center. The majority of them (160 cases, 62.0%) occurred in jurisdictional counties, and the remaining 98 (38.0%) occurred in non-jurisdictional counties. As before, we will present information about demographics and the mechanism of death.

Sixty-four percent (64.0%) of decedents were male and 36.0% were female. Figure 6.1 shows the age distribution of these decedents by sex. The age distribution of males and females is approximately similar. As might be anticipated, the average age for decedents with a natural manner of death is higher than homicide, suicide, or accident, with a distribution maximum at 55-64 years on the figure below.

**Figure 6.1 Natural Death Counts by Age by Sex, 2023 (N = 258)**

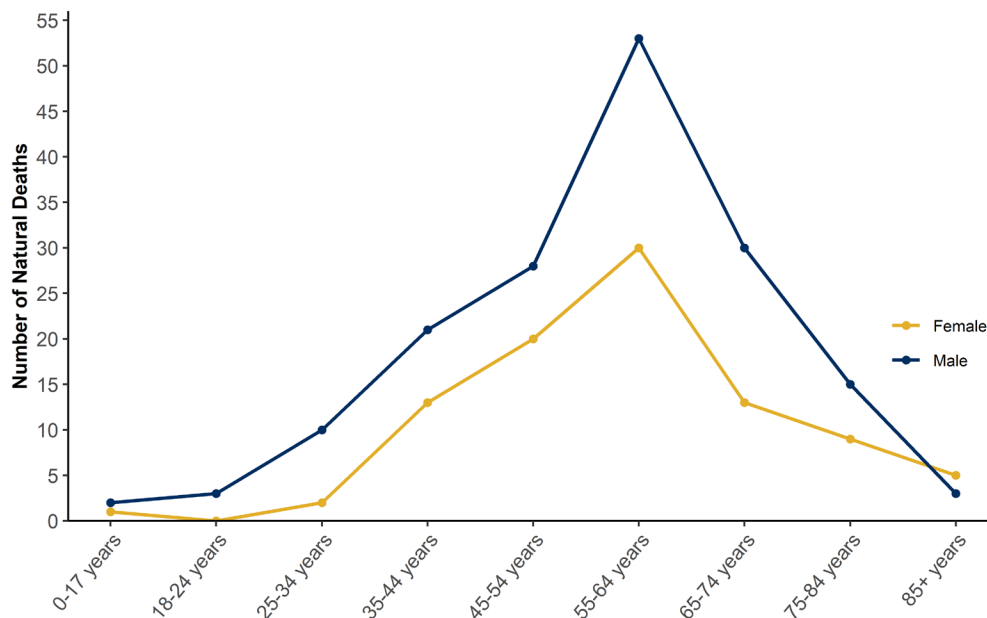
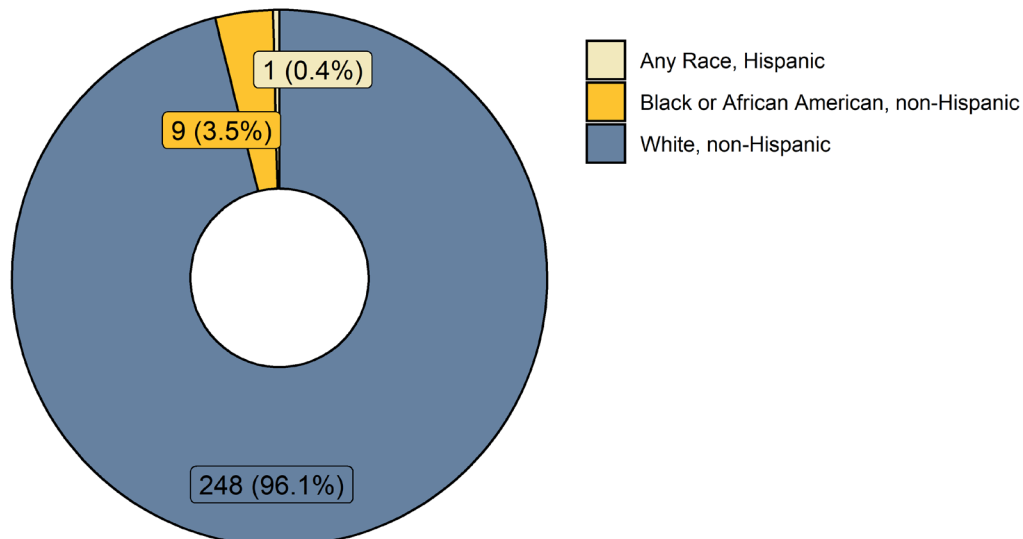


Figure 6.2 below shows the race and ethnicity distribution of these decedents. About ninety-six percent (96.1%) of decedents were white, non-Hispanic.

**Figure 6.2 Race and Ethnicity of Natural Deaths, 2023 (N = 258)**



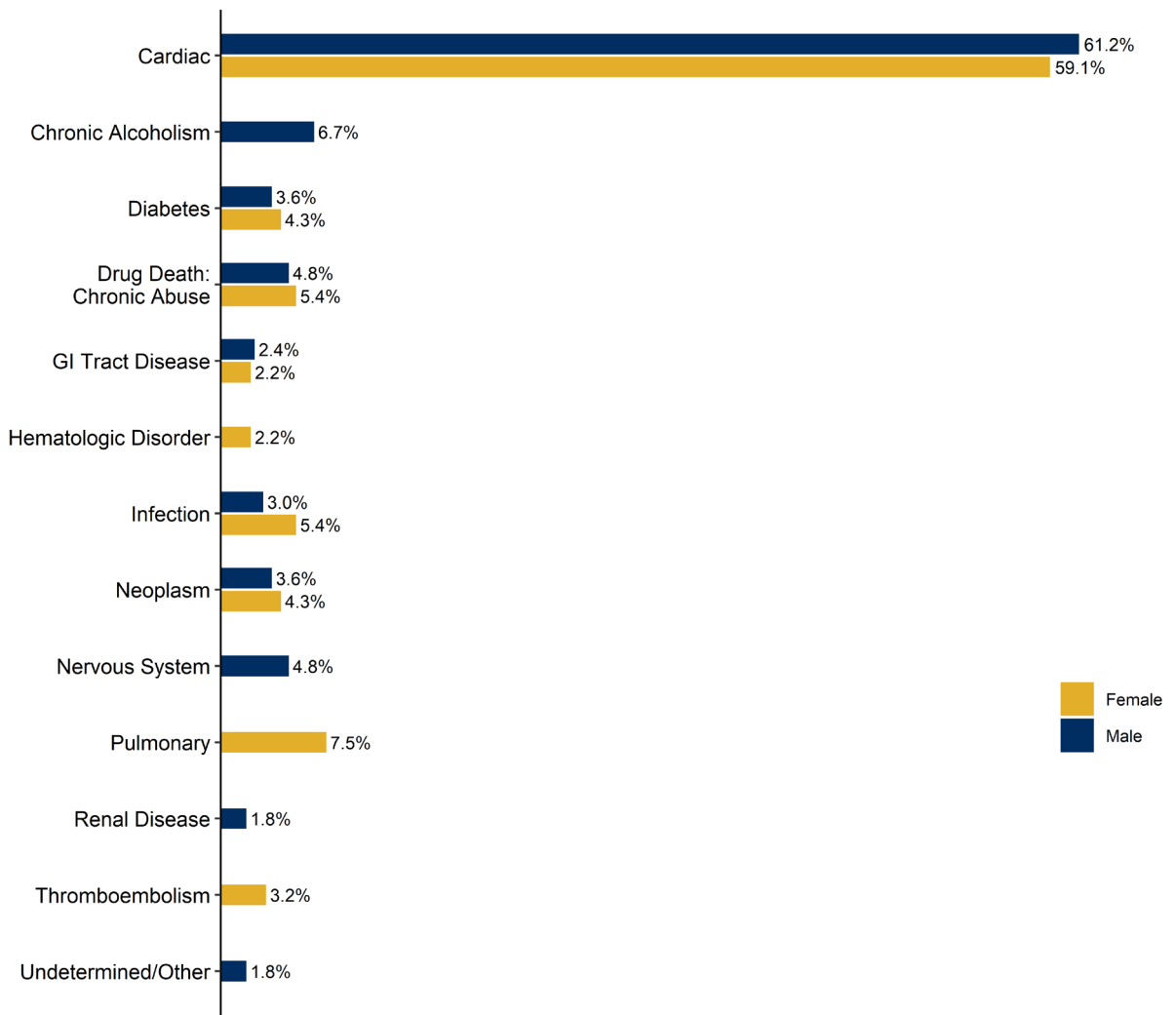
**Table 6.1 Mechanism of Natural Deaths by Sex, 2023 (N = 258)**

	Male		Female	
	Count	Percent	Count	Percent
Aneurysm Rupture	1	0.6	0	0.0
Aorta Dissection	0	0.0	1	1.1
Cardiac	101	61.2	55	59.1
Chronic Alcoholism	11	6.7	1	1.1
Cirrhosis	1	0.6	1	1.1
Diabetes	6	3.6	4	4.3
Drug Death: Chronic Abuse	8	4.8	5	5.4
GI Tract Disease	4	2.4	2	2.2
Hematologic Disorder	1	0.6	2	2.2
Heritable, Genetic, or Congenital Disorder	0	0.0	1	1.1
Infection	5	3.0	5	5.4
Infection: COVID-19	2	1.2	0	0.0
Neoplasm	6	3.6	4	4.3
Nervous System	8	4.8	1	1.1
Pulmonary	2	1.2	7	7.5
Renal Disease	3	1.8	0	0.0
Seizure Disorder	2	1.2	1	1.1
Thromboembolism	1	0.6	3	3.2
Undetermined/Other	3	1.8	0	0.0
<b>Total</b>	<b>165</b>		<b>93</b>	

Table 6.1 and Figure 6.3 show the counts by mechanism by sex. The majority of natural deaths for both male and female decedents were due to a cardiac-related cause. Chronic alcoholism is the next most-common mechanism for male decedents, but the difference in proportion is substantial. Similarly, pulmonary issues are the next most-common mechanism for female decedents, but we observe a similarly large difference in proportion between cardiac-related causes and all others. Figure 6.3 on the following page shows this contrast very clearly.



**Figure 6.3 Natural Deaths by Mechanism by Sex, 2023 (N = 258)**



## VII. Undetermined Death Demographics

In 2023, there were 22 undetermined deaths reported to the forensic center. These are deaths in which no one manner of death is more compelling than one or more others. These are often complex cases and can be unique to a degree that makes tabulating statistics difficult. We also have a very small number of undetermined deaths, so we must limit our discussion to a brief overview of basic demographics and mechanism of death.

About fifty-nine percent (59.1%) of decedents were male, and 36.3% were female. Additionally, there was one case where decedent sex could not be determined due to complex circumstances.

Ninety-one percent (90.9%) of decedents were white, non-Hispanic, and 4.5% were of Hispanic ethnicity. There was one additional case where decedent race was unspecified.

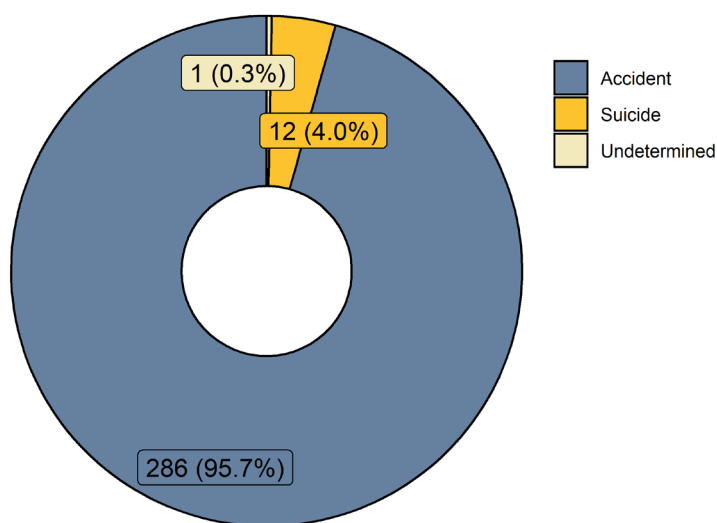
For the majority of these cases, multiple manners of death were potentially compelling to a degree that is difficult to summarize concisely. Several of them involve potential drug overdose, sudden infant death, or drowning.

## VIII. Drug-Related Death Demographics

In 2023, there were 312 drug-related deaths reported to the forensic center, defined as deaths where the circumstances type was stated as a drug death. Thirteen of these were chronic drug abuse deaths and will be excluded from the statistics presented in this section, bringing the total number of cases to 299.

The majority of them (171 cases, 57.2%) occurred in non-jurisdictional counties, and the remaining 128 (42.8%) occurred in jurisdictional counties. Figure 8.1 shows the distribution of drug-related deaths by manner. More than ninety-five percent (95.7%) of drug-related deaths were accidental, followed by suicide (4.0%) and undetermined intent (0.3%). As mentioned above, drug-related deaths that are classified as natural manner are always cases where the decedent dies due to chronic abuse and are usually excluded from discussions related to overdose.

**Figure 8.1 Drug-Related Deaths by Manner, 2023 (N = 299)**



Almost sixty-five percent (194 cases, 64.9%) were male decedents, and the remaining 105 (35.1%) were female. Females involved in a drug-related death tended to be younger on average than males involved in a drug-related death. Fewer than ten decedents were under the age of 18, and the youngest was 17 years old. Figure 8.2 on the following page shows the age distribution of drug-related deaths by sex.

**Figure 8.2 Drug-Related Deaths by Age by Sex, 2023 (N = 299)**

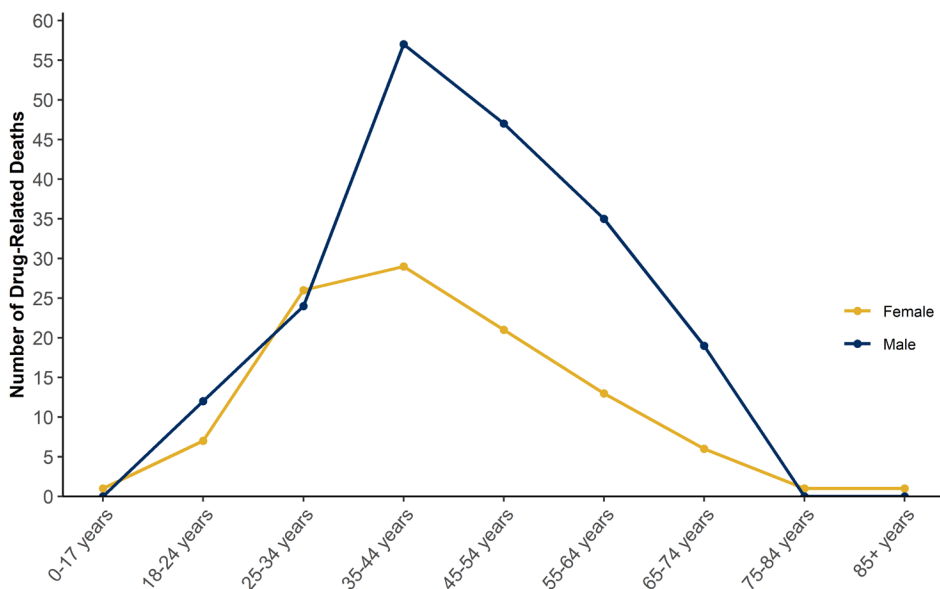
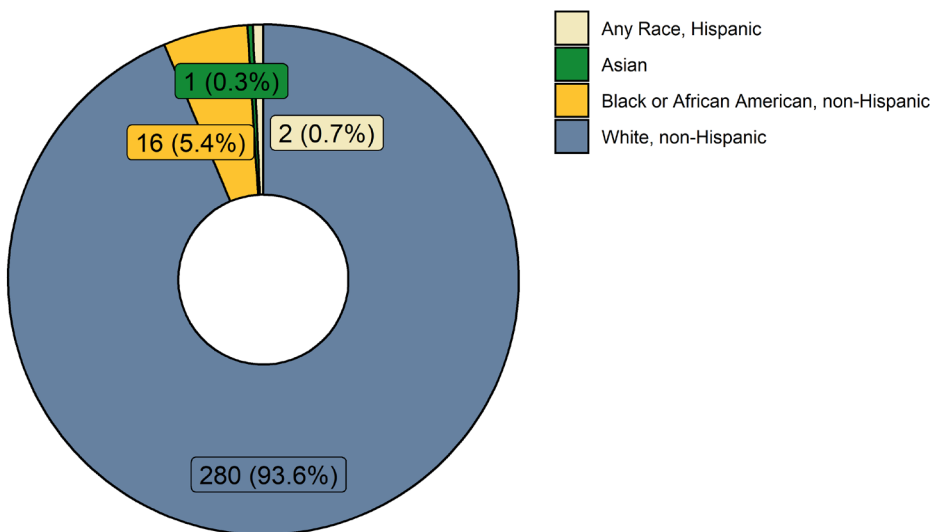


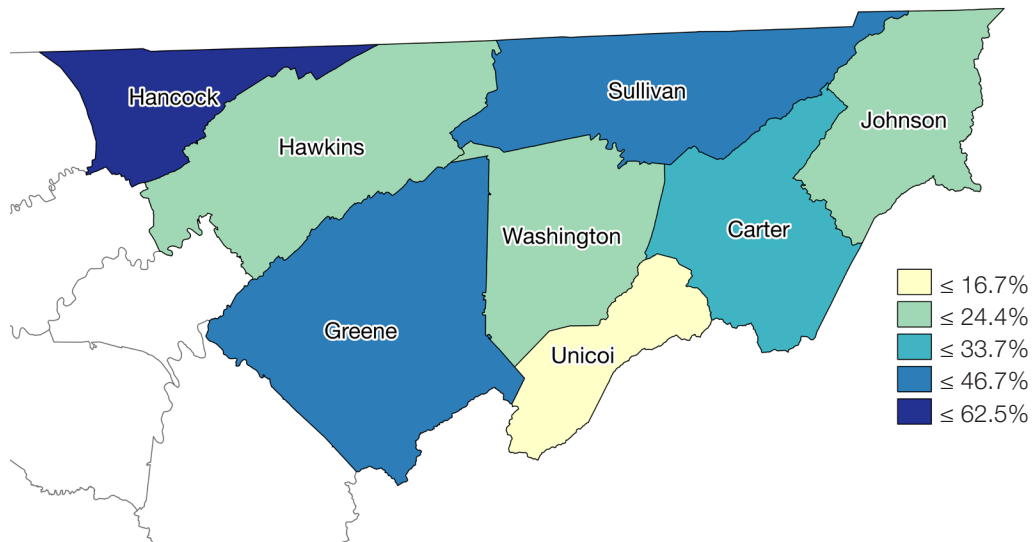
Figure 8.3 below shows the race and ethnicity information for individuals who were involved in drug-related deaths. Almost ninety-four percent (93.6%) of decedents were white, non-Hispanic.

**Figure 8.3 Race and Ethnicity of Drug-Related Deaths, 2023 (N = 299)**



Map 8.1 on the next page shows the percentage of jurisdiction-accepted cases that are drug-related for each county. Recall from Section II that the overall counts for Hancock County are below ten, meaning that they are too unstable to produce reliable statistics. Excluding Hancock due to low counts, the counties with the highest percentages of drug-related deaths compared to their overall JA case count are Sullivan (46.7%) and Greene (41.3%).

**Map 8.1 Percentage of Drug-Related Deaths by County, 2023 (N = 299)**



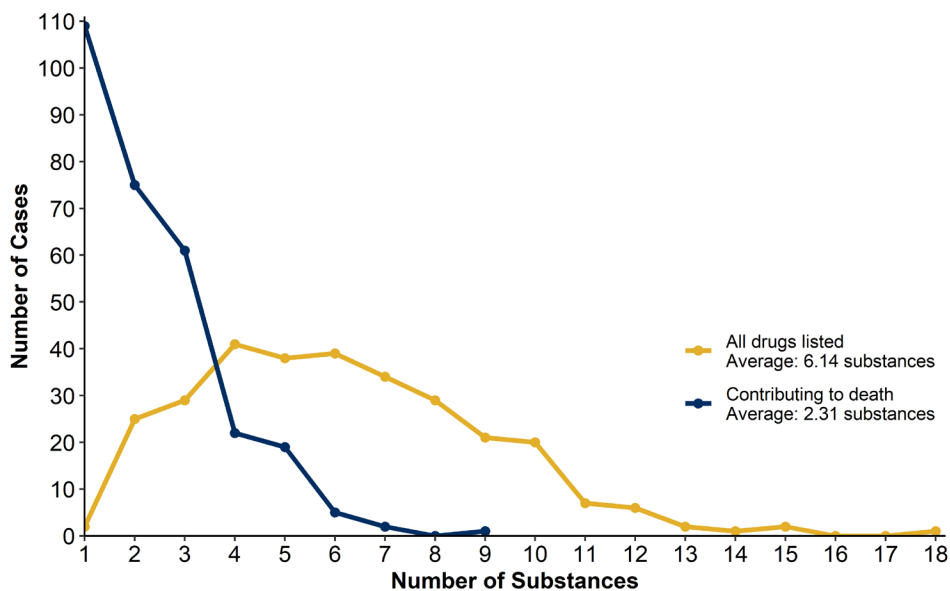
We now turn our attention to the toxicology information available for drug-related deaths. Manual review shows that two decedents did not have toxicology testing due to a long period of hospitalization prior to death. For the remainder of this section, we have excluded these cases and will only consider toxicology information for 297 cases.

Further, we excluded substances related to the 1919FL Electrolytes and Glucose Panel (Vitreous) that is sometimes ordered. These results should not contribute to any count that is meant to represent the number of ingested substances and/or metabolites of ingested substances, so these were excluded from any analysis. Similarly, we excluded positive results for caffeine, cotinine, and nicotine. These are not controlled substances and they are almost never present at potentially toxic levels, so our analysis again considers these extraneous substances and excludes them.

Figure 8.4 shows the distribution of the number of positive substances on the toxicology results for the 297 cases with available information. The blue line shows the count for all present substances, except for the exclusions mentioned above. We remind the reader that metabolites show up as distinct from the substance the decedent took. For example, depending on the time the drug spent in the system prior to death, a person taking illicit fentanyl may test positive for 1) fentanyl alone, 2) fentanyl and norfentanyl, 3) fentanyl and 4-ANPP, 4) fentanyl, norfentanyl, and 4-ANPP. This may be further impacted by residual metabolites of substances taken on a chronic basis.

Because of this, we also show the number of substances indicated as contributing to death as the yellow line, which assumes that the pathologist has interpreted the toxicology results to indicate the actual substances ingested. In some cases, a metabolite is endorsed as contributing to death when the original substance has already been fully metabolized. For example, if a decedent is positive for benzoylecognine, but the original cocaine is not present, the pathologist may endorse benzoylecognine as contributing to death but write 'cocaine' on the certificate. If both cocaine and benzoylecognine are present, the expectation would be that only cocaine would be endorsed as contributing.

**Figure 8.4 Number of Substances Present on Toxicology in Drug-Related Deaths, 2023 (N = 297)**



We note here that an additional 3 cases had no substances indicated as contributing to death. In two of these, the death was attributed to cocaine due to the detection of a cocaine metabolite, but that metabolite was not indicated as contributing to death. In the final case, the substance was sufficiently novel that it had to be tested for separately and the result was not included because the testing was done by a different organization.

We can see in Figure 8.4 above that the number of drugs showing positive (average number is 6.14 substances) is much higher on average than the number of drugs listed as contributing to death (average number is 2.31 substances). Given the discussion on metabolites, this result is not surprising.

Also of interest are the specific substances present. We limit our focus here to only the 294 cases where one or more substances were listed as contributing to death. It is also helpful to distinguish between single-drug deaths, where one substance was listed as contributing to death, and polydrug deaths, where two or more substances were listed as contributing to death. One-hundred eighty-five drug-related deaths (63.0%) were polydrug, and 109 (37.0%) were single-drug. The substances contributing to death are listed in Table 8.1 on the next page.

**Table 8.1 Substances Contributing to Death in Drug-Related Deaths, 2023 (N = 294)**

<b>(a) Single-Drug Deaths</b>			<b>(b) Polydrug Deaths</b>		
	<b>Count</b>	<b>Percent</b>		<b>Count</b>	<b>Percent</b>
Methamphetamine	65	59.6	Fentanyl	133	71.9
Fentanyl	26	23.9	Methamphetamine	114	61.6
Cocaine	5	4.6	Buprenorphine - Free	34	18.4
Acetaminophen	1	0.9	Gabapentin	25	13.5
Amitriptyline	1	0.9	Alprazolam	23	12.4
Benzoyllecgonine	1	0.9	4-ANPP	15	8.1
Bromazolam	1	0.9	Cocaine	15	8.1
Buprenorphine - Free	1	0.9	Diphenhydramine	15	8.1
Bupropion	1	0.9	Ethanol	15	8.1
Ethanol	1	0.9	Oxycodone - Free	15	8.1
Gabapentin	1	0.9	Xylazine	15	8.1
Hydrocodone - Free	1	0.9	para-Fluorofentanyl	14	7.6
Methanol	1	0.9	Bromazolam	13	7.0
Mirtazapine	1	0.9	Hydrocodone - Free	10	5.4
Oxycodone - Free	1	0.9	Promethazine	10	5.4
Venlafaxine	1	0.9	Acetyl Fentanyl	9	4.9
<b>Total Number of Decedents</b>	<b>109</b>		Mitragynine	8	4.3
			Clonazepam	7	3.8
			Diazepam	6	3.2
			Morphine - Free	5	2.7
			<b>Total Number of Decedents</b>	<b>185</b>	

The majority of single-drug deaths were due to methamphetamine (59.6%), with the second most common substance being fentanyl (23.9%). The remainder of substances in single-drug deaths had very small counts.

Because multiple substances are associated with a single decedent for polydrug deaths, interpreting these counts is more complex. For readability, we truncate the list to substances listed for five or more decedents. In polydrug deaths, the most common substance was fentanyl (71.9%), although methamphetamine was present in a majority of deaths as well (61.6%). For 90 of the 185 polydrug decedents (48.6%), both fentanyl *and* methamphetamine were present. No other substances were present in such a high percentage of decedents, but buprenorphine and gabapentin were the next most common substances.

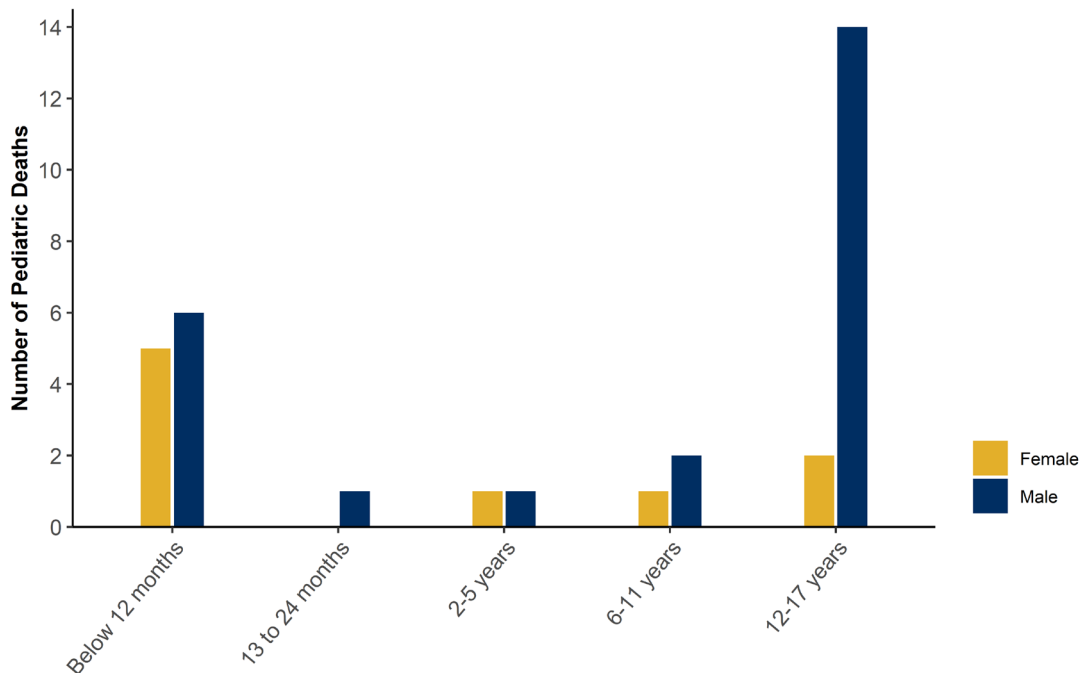
## IX. Pediatric Death Demographics

In 2023, there were 33 pediatric deaths accepted by WLJFC, defined as deaths where the decedent's age at death is below 18. To discuss pediatric deaths, we will use the grouping schema recommended by the National Institute of Child Health and Human Development (NICHD), with some modifications: infants below one year in age, toddlers between 13 and 24 months, children in early childhood between 2 and 5 years, children in middle childhood between 6 and 11 years, early adolescents between 12 and 17 years. Our modifications are to group newborns (0-28 days) with all infants, and we truncate early adolescence at 17 years instead of 18 years. It should be mentioned that there is not a standard epidemiological grouping for pediatrics; cultural and social nuances can make this complex.

Figure 9.1 shows the number of pediatric deaths by age group by sex. Adolescent decedents are more likely to be male (87.5%) than female (12.5%). No other age group has a total count greater than ten, so even though there appears to be less variation by sex in pediatric cases when compared to other sections in this report, we remind the reader that small counts are not stable enough for interpretation.

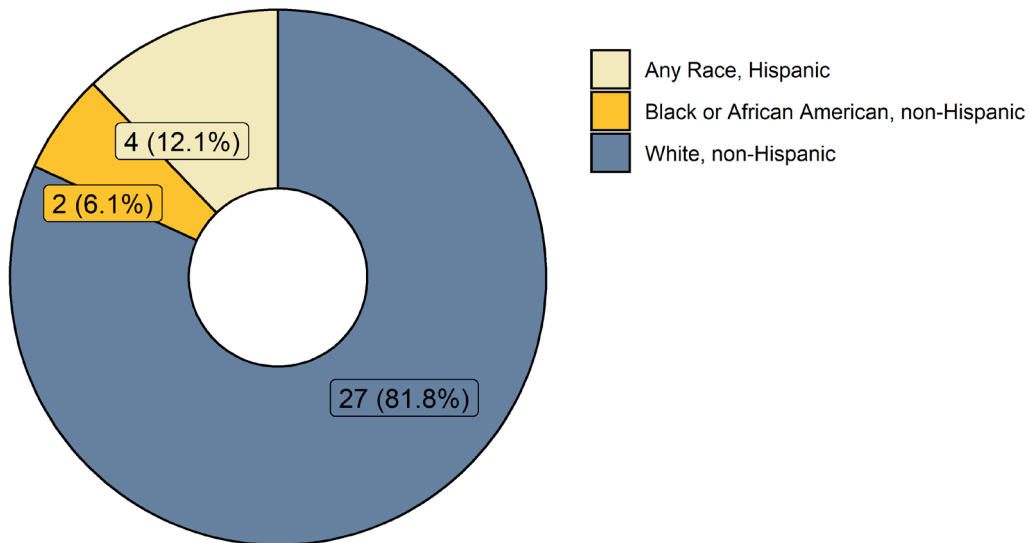
Figure 9.2 on the next page shows the race and ethnicity of pediatric decedents. The majority are white, non-Hispanic (81.8%).

**Figure 9.1 Pediatric Deaths by Age by Sex, 2023 (N = 33)**





**Figure 9.2 Race and Ethnicity of Pediatric Deaths, 2023 (N = 33)**



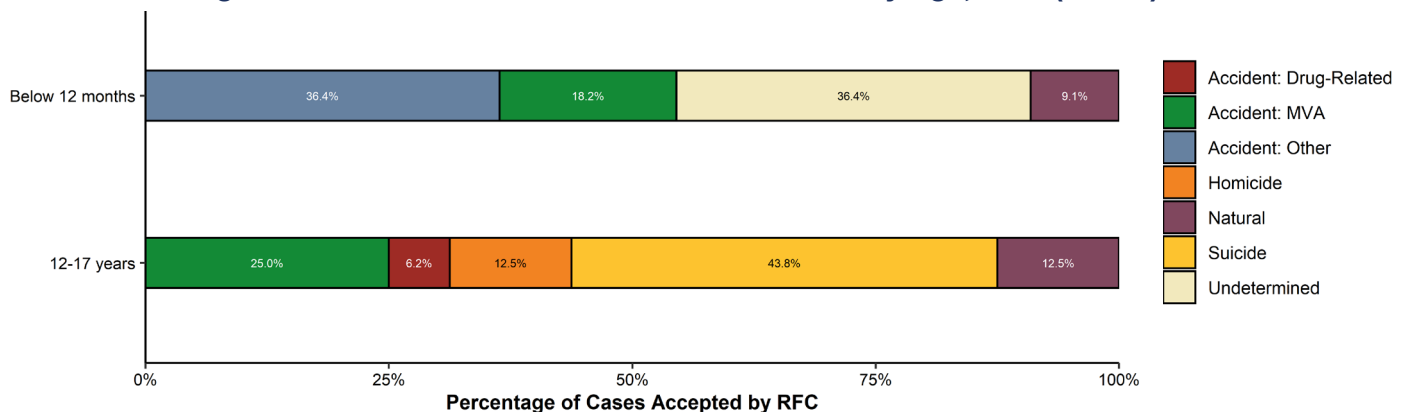
There is substantial variation in the manner and mechanism of death by age in the pediatric population. Table 9.1 presents the number of pediatric deaths by manner by age group, and Figure 9.3 shows this distribution by age group for infants and adolescents. Other age groups are not shown on the figure due to low counts.

We will discuss manner and mechanism for each age group separately; because the counts are so small, this discussion will be limited to infants and adolescents.

**Table 9.1 Manners of Death for Pediatric Cases by Age, 2023 (N = 33)**

	Accident: Drug-Related	Accident: MVA	Accident: Other	Homicide	Suicide	Undetermined	Natural	Total
Below 12 months	0	2	4	0	0	4	1	11
13 to 24 months	0	0	0	0	0	1	0	1
2-5 years	0	1	0	1	0	0	0	2
6-11 years	0	2	0	0	0	1	0	3
12-17 years	1	4	0	2	7	0	2	16
<b>Total</b>	<b>1</b>	<b>9</b>	<b>4</b>	<b>3</b>	<b>7</b>	<b>6</b>	<b>3</b>	<b>33</b>

**Figure 9.3 Manners of Death for Pediatric Cases by Age, 2023 (N = 33)**



## Birth to 12 Months

About thirty-three percent (33.3%) of pediatric deaths in 2023 were decedents below the age of one year. Six of the eleven deaths were due to unsafe sleeping conditions. Two were related to complications arising from motor vehicle accidents. One accidental death was due to drowning. The remaining two cases have been classified as sudden unexpected infant death (SUID) cases.

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## Ages 12 to 17 Years

Forty-eight percent (48.5%) of pediatric deaths in 2023 were decedents between twelve and seventeen years old. We will look at the mechanism of these deaths based on the manner.

Thirty-one percent (31.2%) of adolescents had an accidental manner of death; one of these was drug-related, and four of these cases were motor vehicle related. We observe the following characteristics:

- ◆ Two decedents were indicated as the driver of the vehicle; one had positive toxicology results
- ◆ One decedent was a pedestrian
- ◆ One decedent was indicated to be riding in a cargo area of the vehicle

Two decedents died due to homicide; one of these was a firearm death.

About forty-four percent (43.8%) of adolescent decedents died due to suicide. Five of the seven were firearm deaths, and two were due to asphyxia. All decedents were male. Five were white, non-Hispanic, and two were of Hispanic ethnicity.

Two decedents had a natural manner of death. One died due to infection, and one died due to a genetic disorder.

## X. Staff-Specific Data

In our final section, we turn our attention to statistics related to forensic center operations. Table 10.1 shows the distribution of case turnaround times for jurisdiction-accepted cases excluding record reviews. Turnaround time is defined as the number of days between the date of death and the date of exam (full autopsy, external or limited exam). The majority of these cases are completed in between 30 and 60 days (54.7%).

**Table 10.1 Case Turnaround Time in 2023 (N = 857)**

	Count	Percent
Less than 30 days	314	36.6
Between 30 and 60 days	469	54.7
Between 60 and 90 days	50	5.8
More than 90 days	24	2.8
Total	857	

We next look at statistics pertaining to individual pathologists. Table 10.2 looks at the actions completed by the forensic center pathologists in 2023 and Table 10.3 looks at the average turnaround time by autopsy type for each pathologist. The average time only includes cases where a turnaround time was available, so we also present the percentage of cases that the average is based off of to allow comparison to other data years. In 2023, turnaround time is available for all cases, but that may not be the case in all data years.

We only present counts for the four medical examiner/forensic pathologists currently working at WLJFC.

**Table 10.2 Activities Completed by Pathologists in 2023**

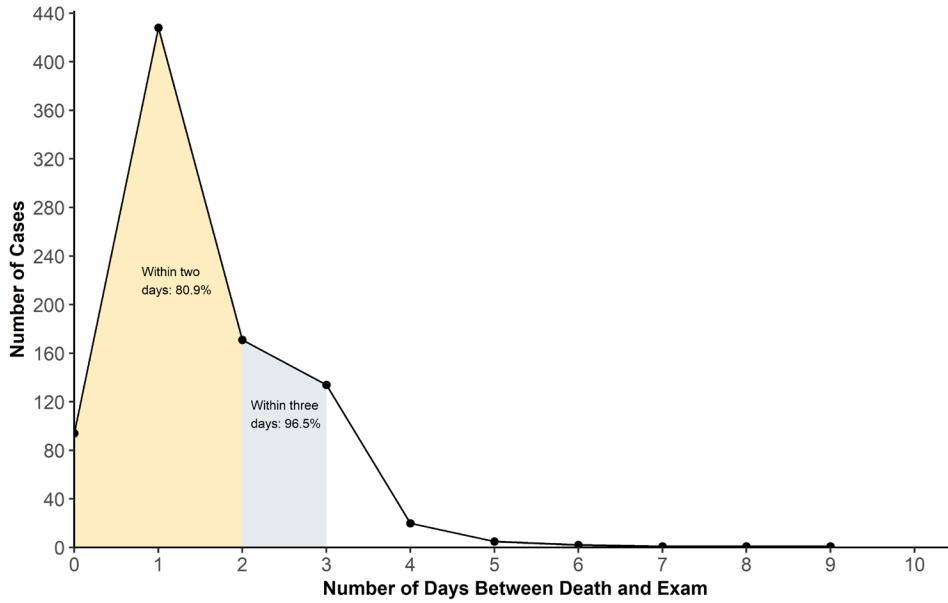
	Cremation Permit	Jurisdiction Declined	Jurisdiction Accepted				Total Number Reported to RFC
			Full Autopsy	External Exam	Limited Exam	Record Review	
Emilie Cook, DO	284	281	193	84	6	46	894
Ami Murphy, DO	8	71	99	29	3	10	220
Andrea Orvik, MD	442	324	210	71	5	48	1100
Ellen Wallen, MD	109	202	93	28	3	24	459

**Table 10.3 Average Pathologist Turnaround Time by Autopsy/Exam Type in 2023**

	Full Autopsy		External Exam		Limited Exam	
	Average Days	Percentage of Available Cases	Average Days	Percentage of Available Cases	Average Days	Percentage of Available Cases
Emilie Cook, DO	48.5	100	23.4	100	37.0	100
Ami Murphy, DO	38.9	100	25.6	100	25.0	100
Andrea Orvik, MD	39.4	100	31.1	100	34.6	100
Ellen Wallen, MD	58.2	100	44.6	100	59.0	100

Another measure related to autopsies and exams is the amount of time between the date the decedent arrived at the forensic center and the exam date. Due to data limitations, we use the date of death as a proxy for the arrival date. Even with this caveat, 80.9% of autopsies and exams are completed within two days of the date of death, and 96.5% are completed within three days, as shown in Figure 10.1.

**Figure 10.1 Number of Days Between Death and Exam or Autopsy in 2023**



Finally, we consider activities performed by the medicolegal death investigators. Table 10.4 shows the actions completed for each investigator and administrator working at WLJFC in 2023.

**Table 10.4 Activities Completed by Investigators and Staff in 2023**

	Cremation Permit	Jurisdiction Declined	Scene Response*	Sent to Facility : Storage	Jurisdiction Accepted		Total Number Reported to RFC
					Sent to Autopsy Facility	Record Review	
<b>RFC Investigators</b>							
Kevin Brown, F-ABMDI	1	188	59	4	196	24	472
Katrina Kokko, D-ABMDI	2	114	33	5	131	20	305
Dean Petrone, D-ABMDI	0	120	41	4	121	18	304
Laura Scala, D-ABMDI	2	167	47	5	199	29	449
Amber Zeigler, D-ABMDI	3	164	61	6	173	24	431
<b>Other Investigators</b>							
Tiffany Gasperson, D-ABMDI	0	18	1	0	0	0	19
Fran Wheatley, F-ABMDI	0	2	1	0	0	0	3
Kristen Osgood, D-ABMDI	0	2	0	0	0	0	2
<b>Staff</b>							
Laura Parsons, F-ABMDI	15	58	22	3	43	15	156
Penny Rutledge	13	0	0	0	0	0	13
Jennifer Poux	367	0	0	0	0	0	367
Miranda Roberts	460	0	0	0	0	0	460

\*Scene response counts are for Washington County cases only

Report prepared by:

Laura Beth Parsons, F-ABMDI  
 Director of Operations  
 William L. Jenkins Forensic Center  
 (423) 439-6788  
[parsonsl@etsu.edu](mailto:parsonsl@etsu.edu)

Molly Golladay  
 Epidemiologist II  
 Tennessee Office of the State Chief Medical Examiner  
 (615) 339-3163  
[molly.golladay@tn.gov](mailto:molly.golladay@tn.gov)

