

# REGIONAL FORENSIC SCIENCE CENTER

Timothy P. Rohrig, Ph.D. - Director

Timothy S. Gorrill, M.D., Ph.D. - District Coroner-Chief Medical Examiner

*Pathology  
Division  
2017  
Annual  
Report*

## **HISTORY/OVERVIEW**

The Regional Forensic Science Center officially opened on December 21<sup>st</sup>, 1995. The Center houses the Pathology Division (including the Office of the District Coroner) and the Forensic Science Laboratories. The Pathology Division is organized into two sections: Medical Investigations and the Autopsy Service.

As mandated by law [KSA 22a-231], the District Coroner has the responsibility for investigating deaths within Sedgwick County that are a result of violence, unlawful means, suddenly when in apparent health, not regularly attended by a physician, any suspicious or unusual manner, when in police custody, or when the determination of the cause of death is held to be in the public interest. The primary goal of investigation and the postmortem examination is to determine cause and manner of death in order to generate a death certificate.

Cause of death is the injury or disease that results in death. Manner of death is determined by circumstances in which the death occurred and includes natural, accident, homicide, suicide, and undetermined. Undetermined manner of death is used when circumstances are unknown or are unclear.

Over the last decade, the number of cases reported annually to the office has averaged 3,120, with generally a steady increase year after year. There has been greater than a one and half fold increase in the number of reported cases and approximately a two and half fold increase in the number of required examinations and medical records review since 1998.

The Pathology Division has been accredited by the National Association of Medical Examiners (NAME) since 2001.

### **PATHOLOGY LEADERSHIP**

#### **District Coroner-Chief Medical Examiner**

*Timothy S. Gorrill, MD, PhD*

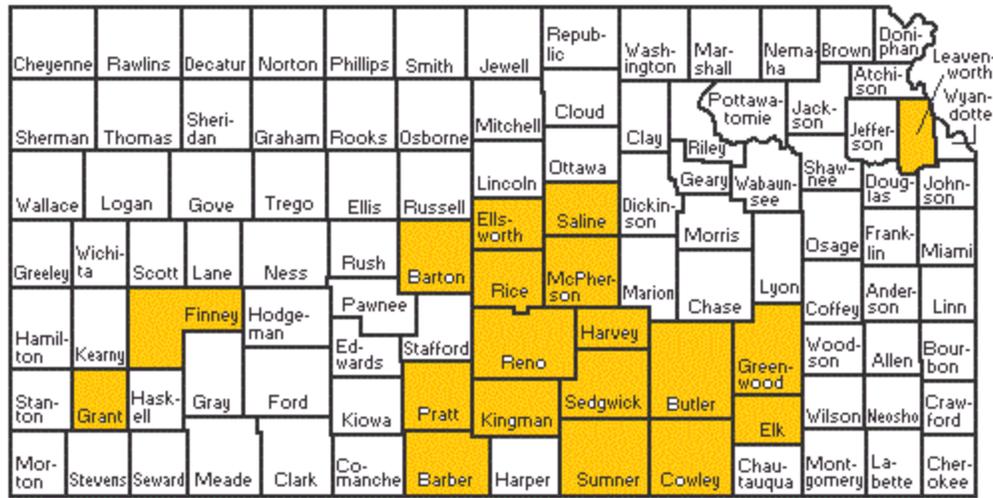
#### **Chief Medical Investigator**

*Shari L. Beck, F-ABMDI*



**COUNTIES SERVED**

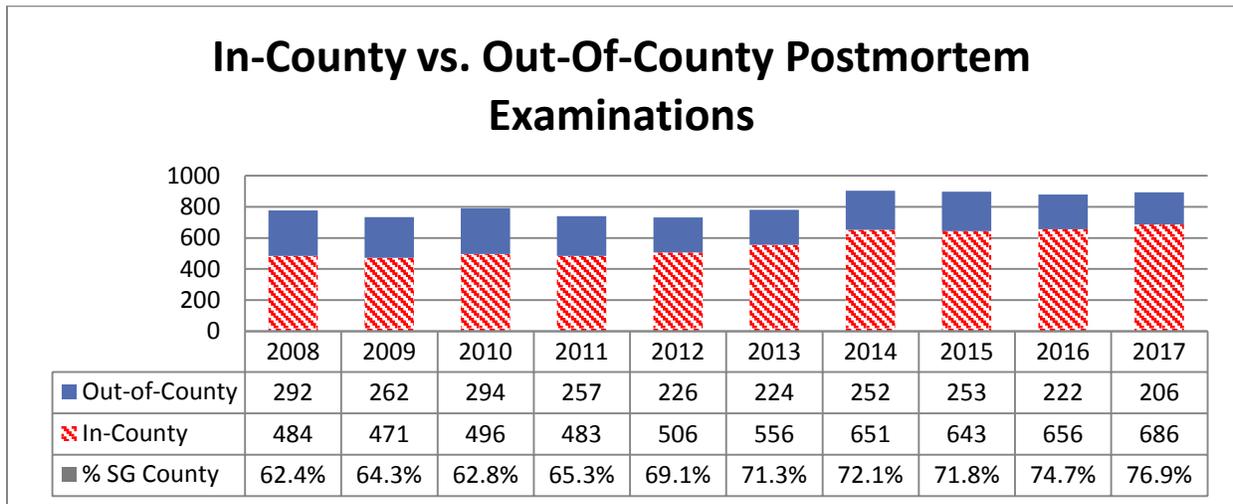
In 2017 [Figure 1], the majority of service provided was for Sedgwick County; however, the Center does provide on a fee for service basis, autopsy examinations for many of the counties in the southcentral region of the state. In total, pathology examinations were performed on cases from 19 counties in 2017.



**Figure 1:** Counties the Pathology Division provided service for in 2017.

**DISTRIBUTION OF CASES: IN-COUNTY VS OUT-OF-COUNTY**

The Pathology Division serves as a resource to other counties in the state of Kansas. In 2017, approximately 23% of the examinations were performed for other counties [Figure 2]. Overall, Sedgwick County cases have increased over the last 10 years. Two cases that were accepted in 2016 were examined in 2017.



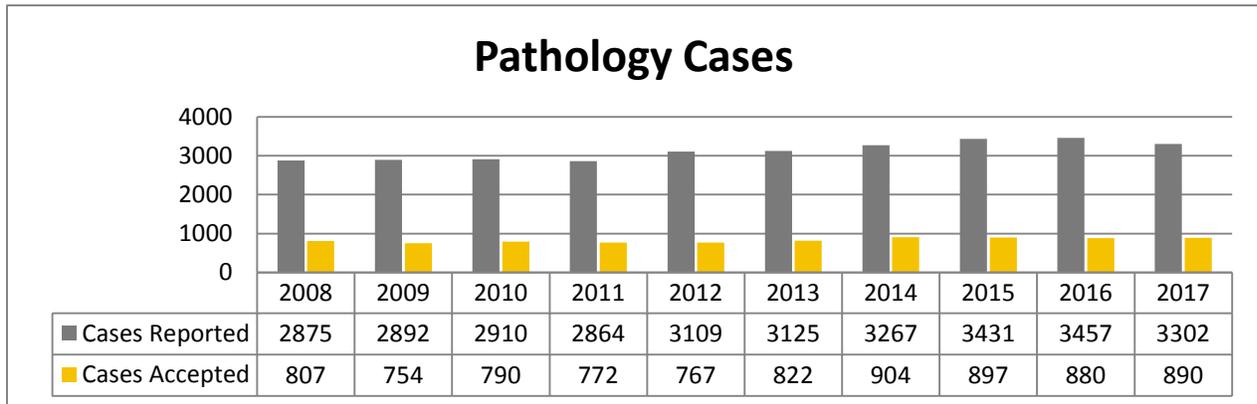
**Figure 2:** Examinations include Full and Partial Autopsies, External Examinations, Non-human Skeletal Remains, and Records Reviews.

## MEDICAL INVESTIGATIONS

The Pathology division has a Chief Medical Investigator and four Medical Investigators. The Medical Investigators are on duty year round, twenty-four hours a day, seven days a week.

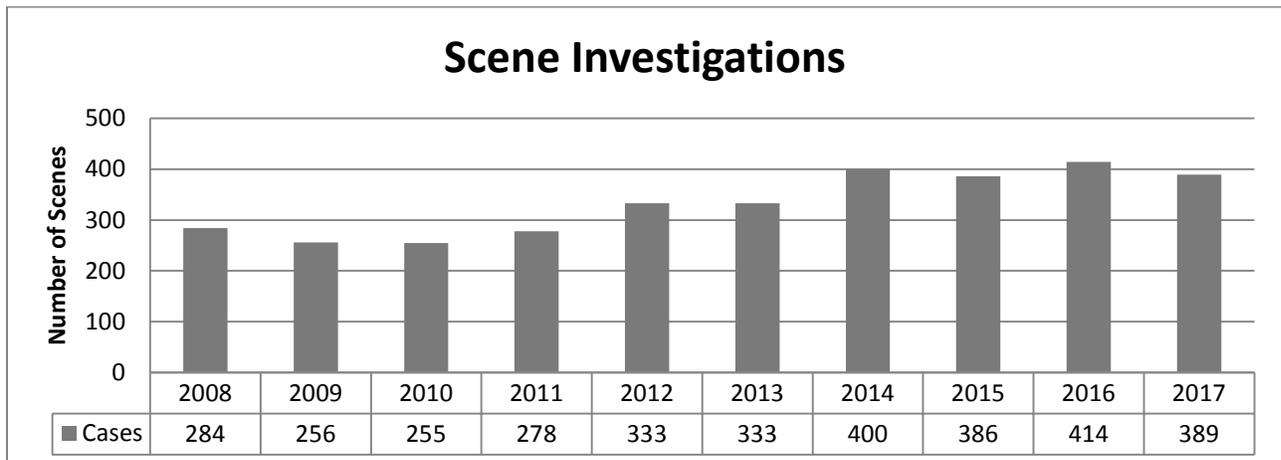
The Medical Investigator serves as the “eyes” and “ears” of the Coroner. The investigators triaged 3302 reported deaths in 2017.

The District Coroner accepted jurisdiction or assisted in 890 cases [Figure 3] of the reported deaths. On average, over the last 10 years, accepted cases constitute 26.5% of the total number reported to the office.



**Figure 3:** Records Reviews, Autopsies, Partial Autopsies, External Examinations, and Non-human Skeletal Remains.

Medical Investigators may attend the scene of a death when it occurs outside of a hospital setting. Pertinent circumstantial and physical observations are documented and photographed, and items of evidence are collected in accordance with state law, good forensic principles and accreditation requirements established by the National Association of Medical Examiners [NAME]. The number of scene investigations by Medical Investigators per year [Figure 4] has shown a steady increase over the last 10 years.

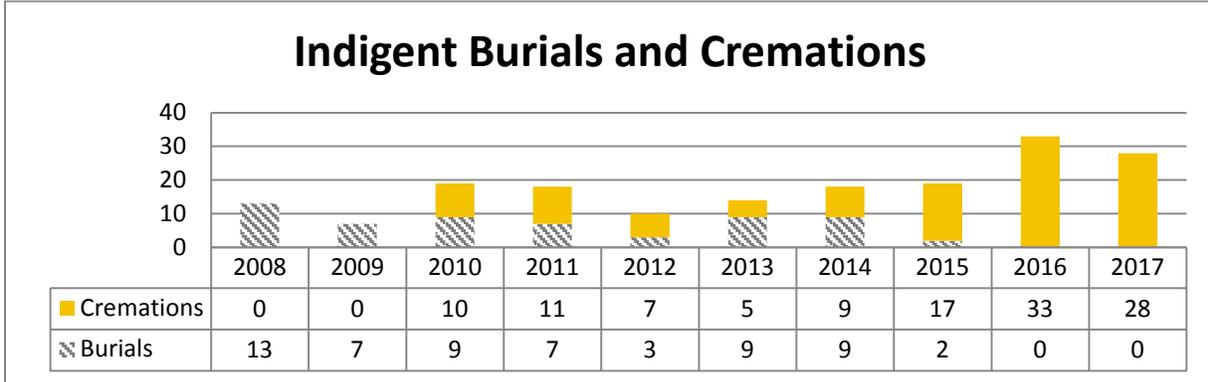


**Figure 4:** Number of scenes that Medical Investigators worked.

## INDIGENT BURIALS AND CREMATIONS

Bodies that are under the jurisdiction of the Coroner shall be delivered to the immediate family or the next of kin of the deceased. If after a diligent search, no family member or concerned party is found that is willing to claim the remains, pursuant to K.S.A. 22a-215, Sedgwick County is required to decently bury/cremate the bodies of unclaimed deceased persons. In accordance with this statute, a procedure has been established by the Center to facilitate the necessary arrangements regarding indigent burials/cremations. The Center maintains a contract with a local mortuary service to handle the disposition of the remains.

Sedgwick County will not be a guarantor of burial/cremation expenses for any claimed body. As of 2016, the Center will cremate all unclaimed bodies under its jurisdiction [Figure 5]. The cremains are retained indefinitely and in a respectful manner.



**Figure 5:** Number of Indigent Burials/Cremations for which the Center took responsibility.

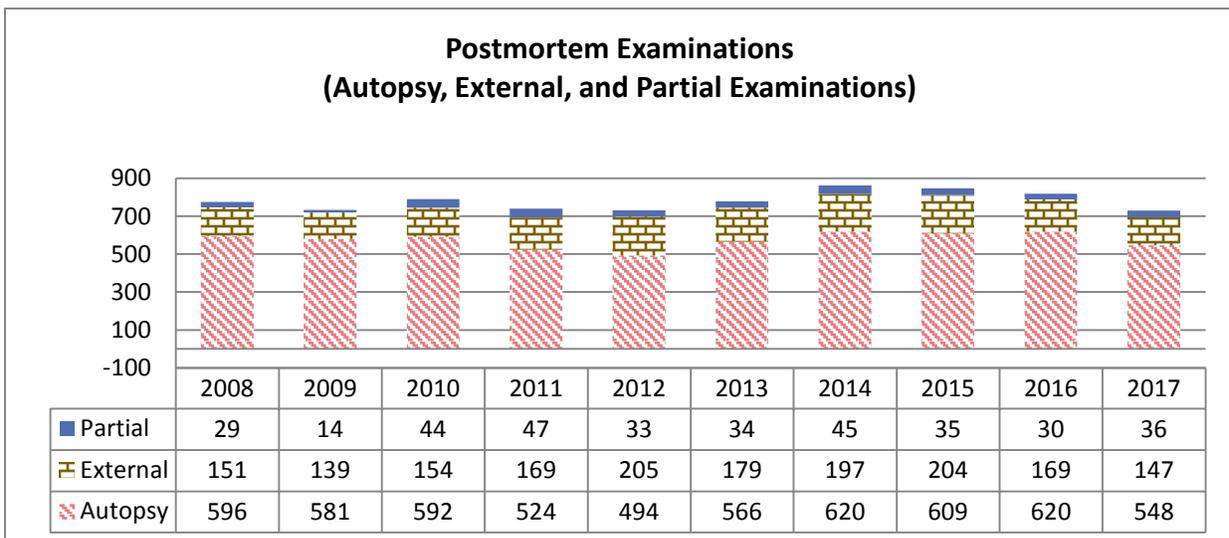
### CASE SUBMISSIONS

In 2017, 3302 deaths from Sedgwick County and referring counties were reported. For Sedgwick County deaths, analysis of the scene, circumstances of the death and the decedent’s medical history were key factors in determining coroner’s jurisdiction. Coroner’s jurisdiction for the referring counties was determined by the referring county Coroner. Jurisdiction was assumed or assistance was provided in 890 cases, of which 548 were complete autopsies.

**Figure 6** shows the number of postmortem exams, that includes full autopsies, partial autopsies, and external examinations. External examinations are performed in cases where scene investigation, circumstances, and medical history and the exam are sufficient to certify the death.

Compared to 2008, there was an 8% reduction in the number of full autopsies in 2017, and twenty percent (20%) of the 2017 examinations were externals only.

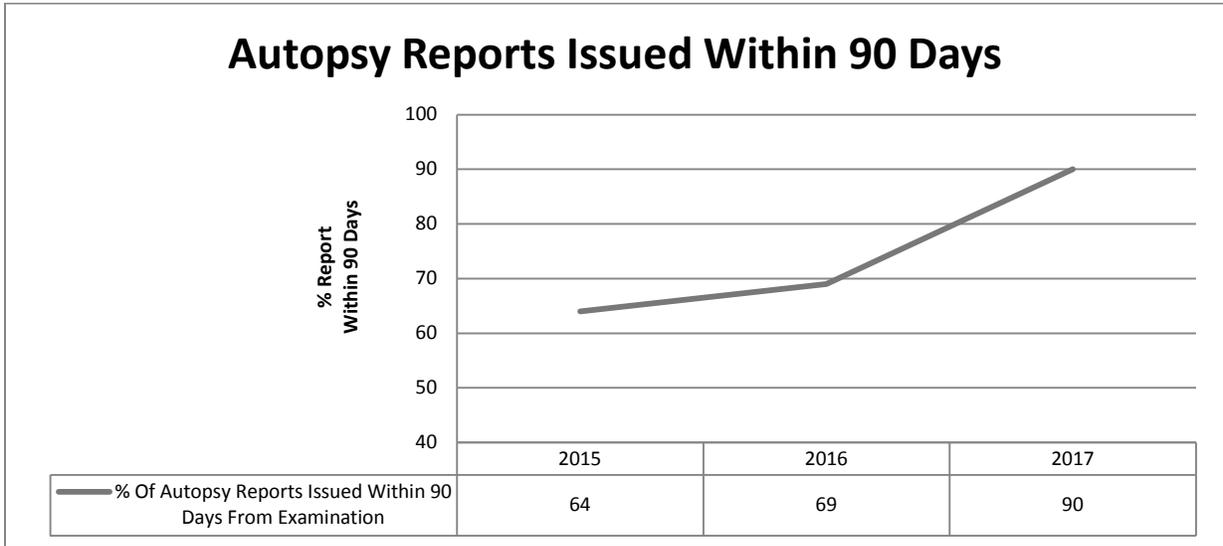
The District Coroner also performed postmortem examinations for other counties within the state of Kansas [See **Figure 2**].



**Figure 6:** Postmortem Examination Type.

**AUTOPSY REPORTS**

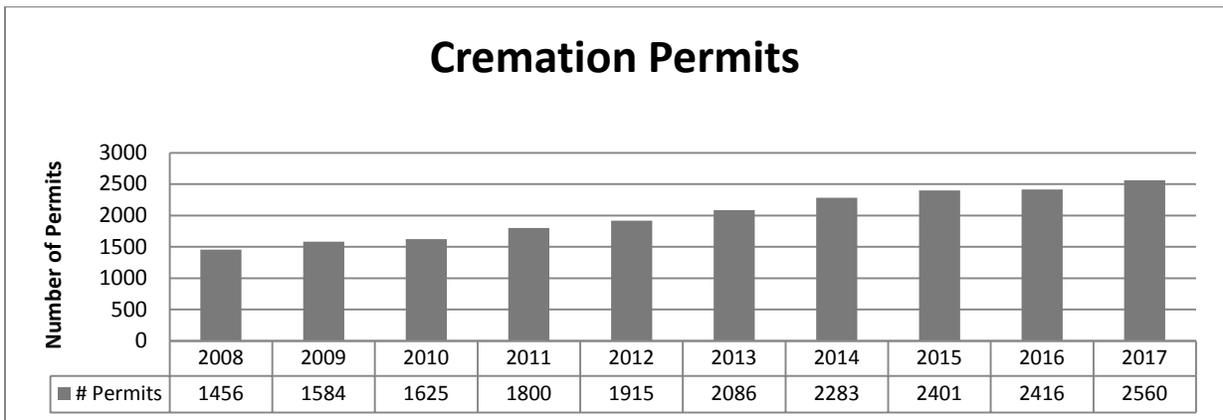
One important metric to monitor the work efficiency of the Pathology Division is the percentage of autopsy reports completed within 90 days of the examination. The improvement in case turn-around-time was multifactorial. The Pathology Division was fully staffed, there was a significant improvement of Toxicology Laboratory turn-around-times, and several process efficiencies were implemented. This resulted in the increase of the percentage of autopsy reports being completed within 90 days as depicted in **Figure 7**.



**Figure 7:** Percentage of autopsy reports being issued within 90 days from examination.

**CREMATION PERMITS**

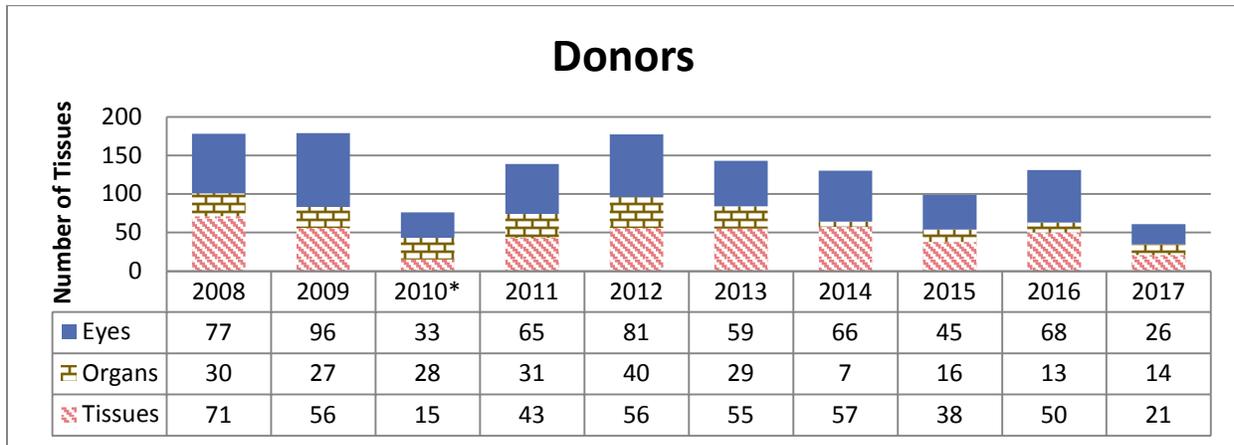
In the state of Kansas, the Coroner is also charged with the investigation of death if the body is to be cremated. The investigation involves confirmation that the death certificate is appropriately executed, and that no further circumstances exist which may have contributed to the death. This may involve interviews with medical personnel, families or other interested parties, and/or a review of medical records. If the cause of death is unclear or falls under the jurisdiction of the Coroner, a postmortem examination and issuance of a revised death certificate may be required. **Figure 8** illustrates the steady increase of cremation permits signed by the Coroner.



**Figure 8:** The number of cremation permits over a 10 year period.

## TISSUE DONATIONS

The Pathology Division works in cooperation with procurement agencies [Kansas Eye Bank, Midwest Transplant Network, and Heartland Lions Eye Bank] to facilitate organ and tissue donation in cases where the death falls under the jurisdiction of the Coroner. **Figure 9** provides the count of eye, organ, and/or tissues donations over a 10 year period.



**Figure 9:** Count of eye, organ, and/or tissues donations. \*The drop in number for 2010 is a reflection of inability to track numbers due to lack of in-house procurement associated with remodeling of the tissue suite.

## MANNER OF DEATH

In addition to determining cause of death, the District Coroner is responsible for determining the manner of death.

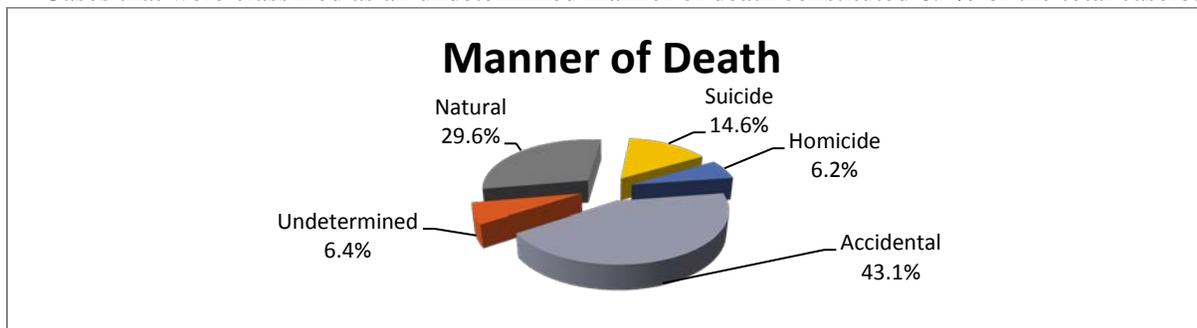
**Figure 10** shows the breakdown of the deaths by manner. Homicides are deaths that result from injuries caused by the actions by another person. Homicides constituted 6.2% of the cases for 2017. The majority (69.1%) of these deaths resulted from gunshot wounds [**Figure 10**].

Suicides are defined as deaths that result from a purposeful action to end one's own life. In 2017, 14.6% of the cases were certified as suicides.

Approximately, 43% of deaths were certified as accidents, which are those that resulted from an unintentional event or chain of events. This category includes most motor vehicle accidents, falls, and accidental drug overdoses.

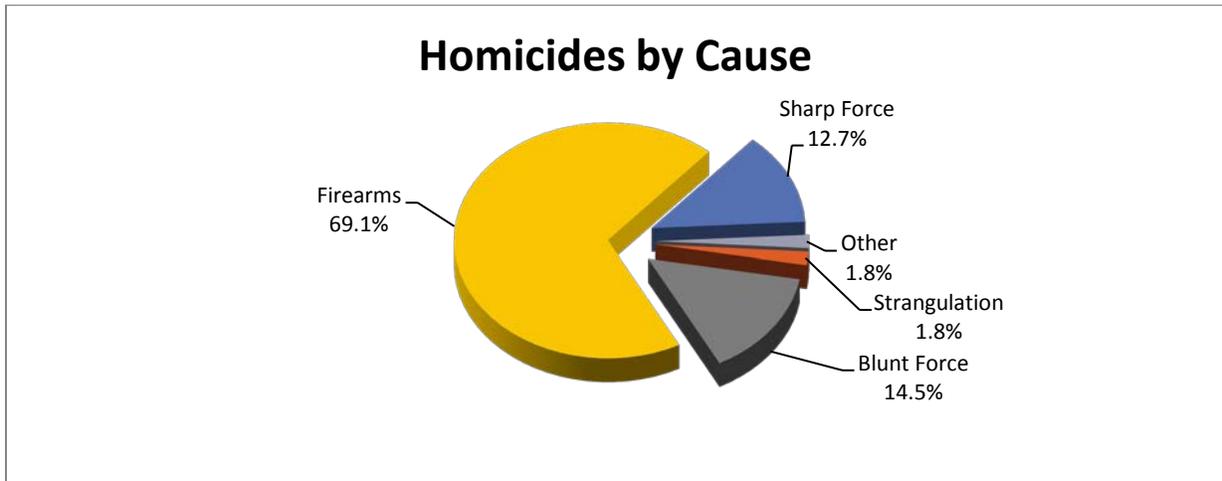
Natural deaths are those that are solely caused by natural disease and constituted 29.6% of the cases. The most common cause of death in cases of sudden, unexpected natural death is coronary artery disease.

Cases that were classified as an undetermined manner of death constituted 6.4% of the total caseload.



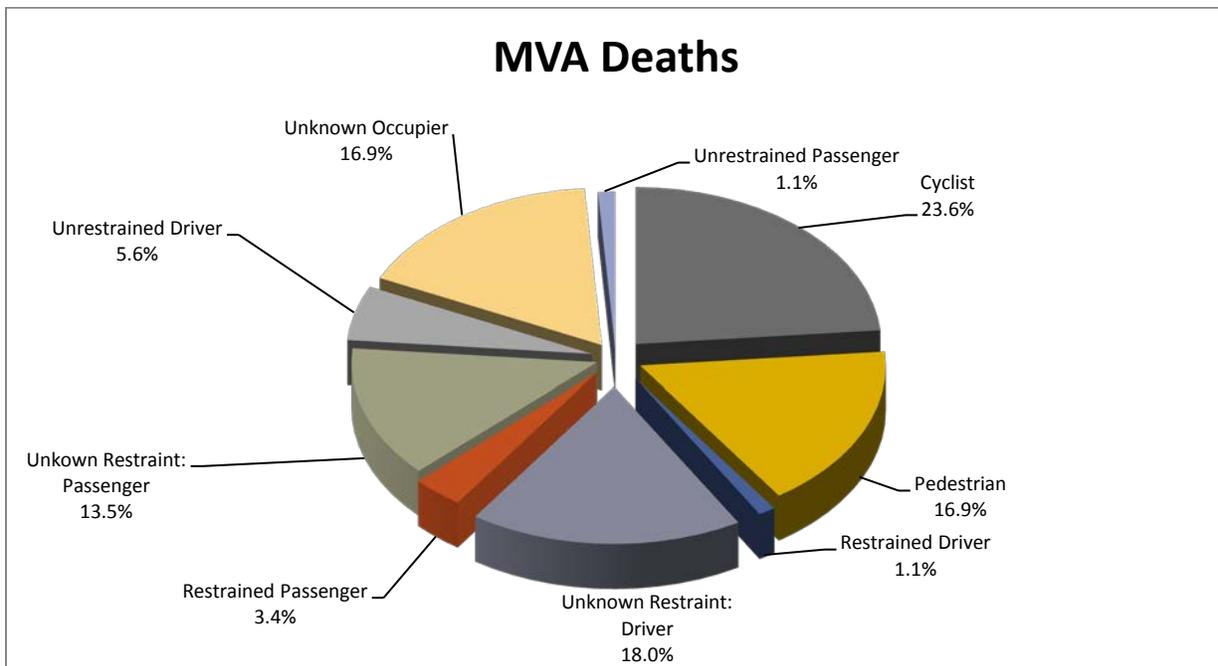
**Figure 10:** Percentages of each manner of death.

In 2017 there were 55 homicides, up from 48 in 2016, that were examined by the pathology division. As illustrated in **Figure 11**, firearms were utilized the greatest percentage of the time for homicides in 2017.



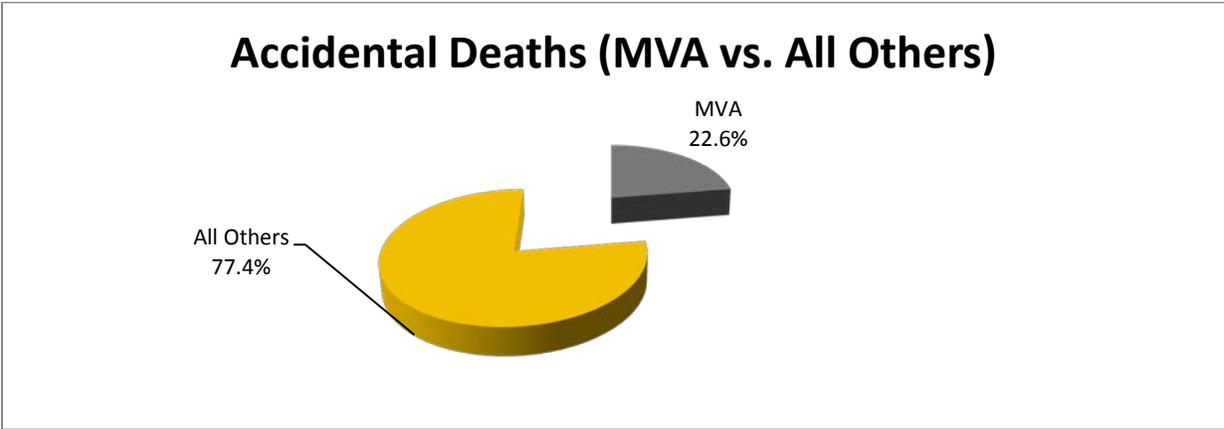
**Figure 11:** Homicides by cause.

In **Figure 12** are the percentages of motor vehicle accidental deaths categorized into the known physical position of the decedent. As illustrated, cyclists had the greatest percentage of deaths in 2017.



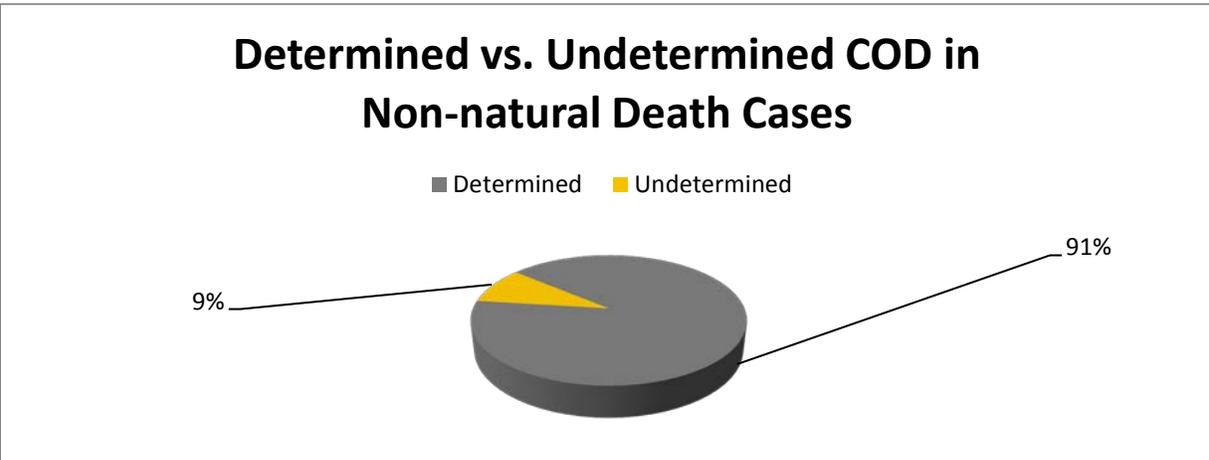
**Figure 12:** MVA deaths per decedent category.

**Figure 13** illustrates that approximately 23% of all accidental deaths were related to motor vehicle accidents (MVA).



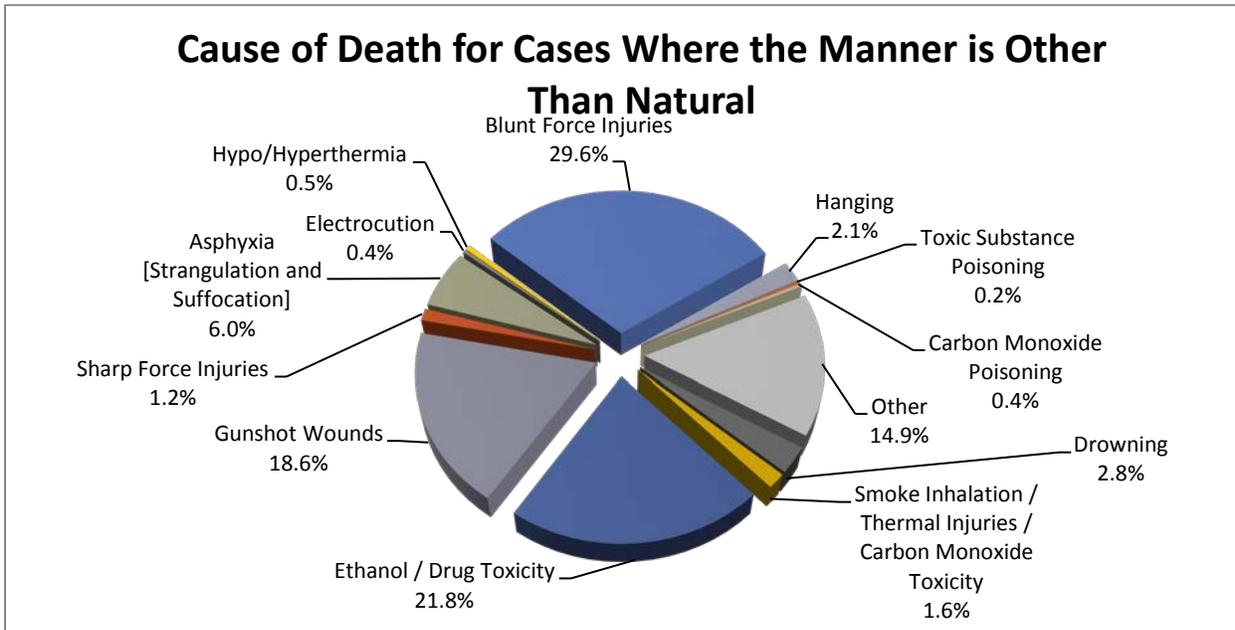
**Figure 13:** Accidental deaths.

The cause of death (COD) can be placed into two general categories, determined or undetermined. **Figure 14** illustrates the percentages of these two categories for cases with a manner of death that is non-natural.



**Figure 14:** Percentage of determined versus undetermined causes of death.

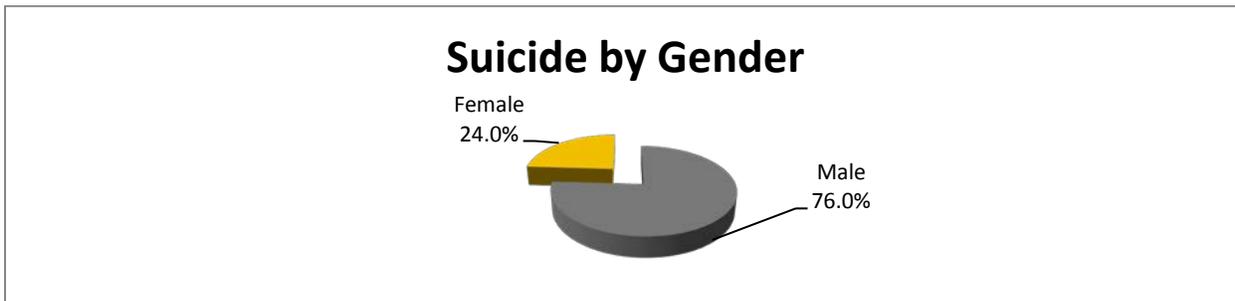
**Figure 15** illustrates the cause of death for cases where the manner was ruled non-natural. Blunt force injuries was the leading casue of non-natural deaths, which are injuries are physical trauma to the body, either by impact, injury or physical attack. These injuries are the initial trauma, which devolops more specific types of injuries such are abrasions, contusions, lacerations, and/or bone fractures.



**Figure 15:** Causes of non-natural deaths.

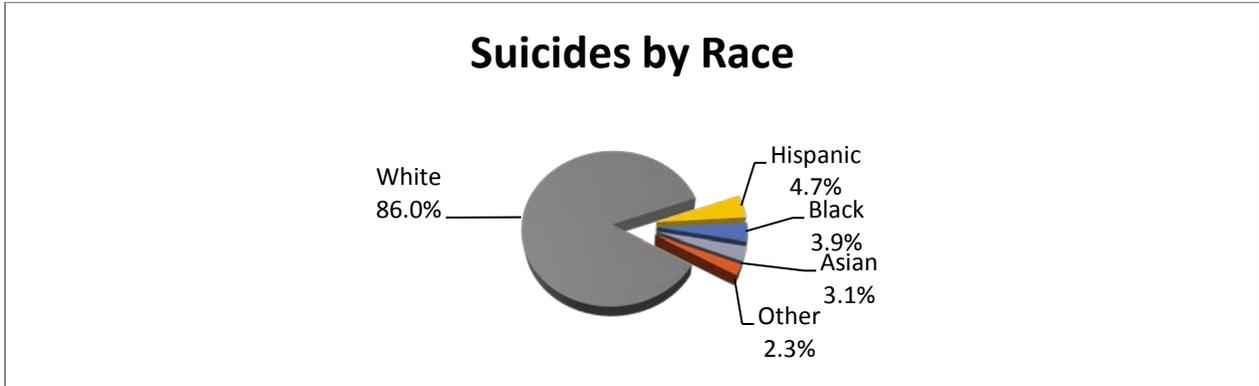
**SUICIDES**

In 2017, 129 cases were certified as suicide. The vast majority of suicides were white male adults [Figure 16, Figure 17, and Figure 18].



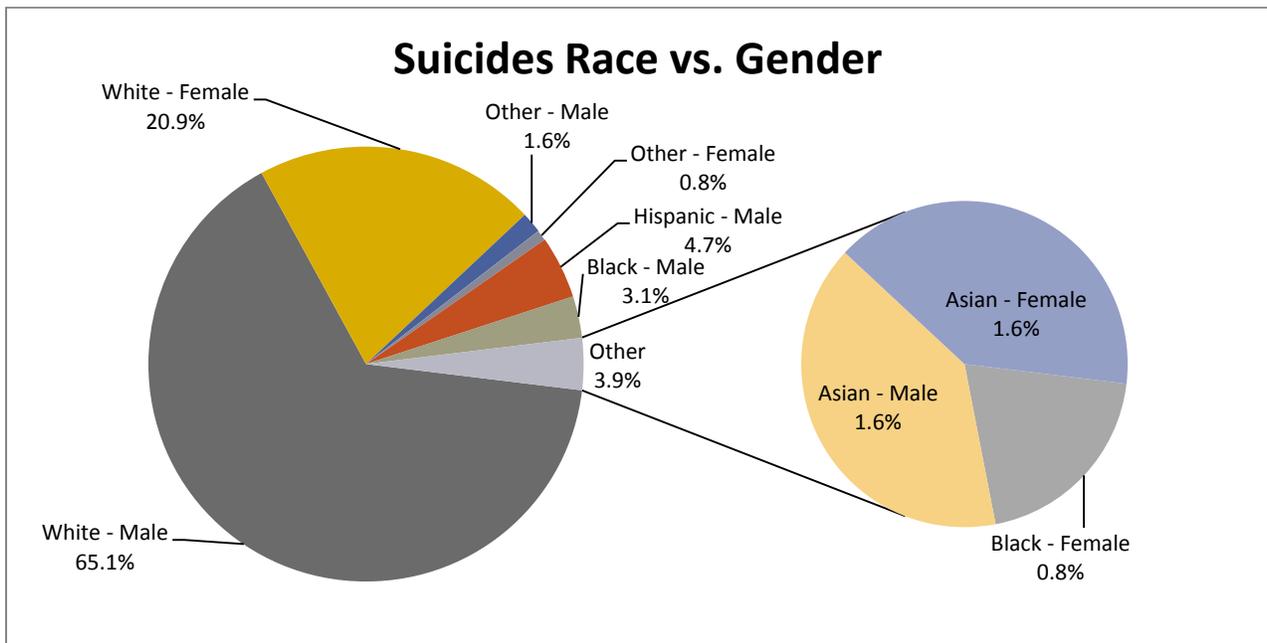
**Figure 16:** Suicides by gender.

**Figure 17** provides the percentage of suicides by race. The race that committed the greatest percentage of suicides is White, with Asians being the lowest percentage reported.



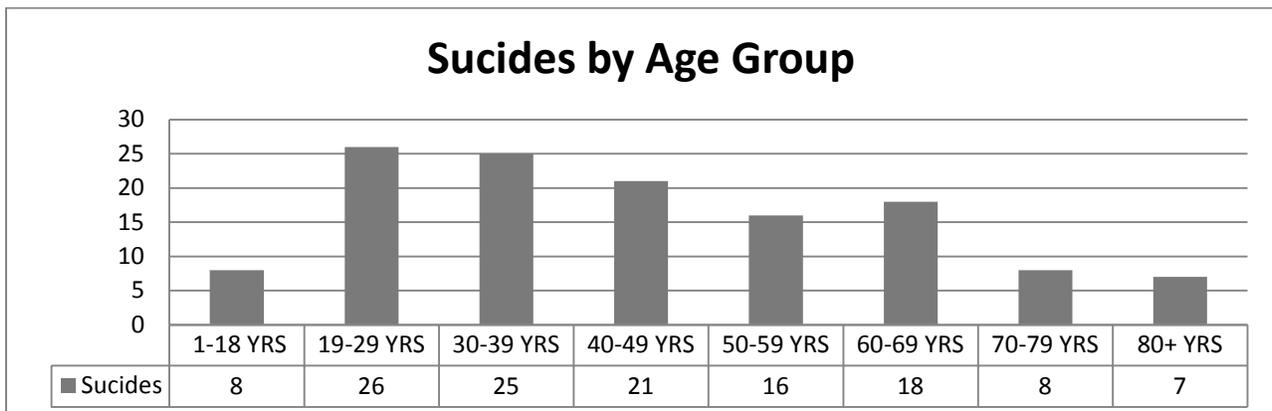
**Figure 17:** Suicides by race.

**Figure 18** provides a breakdown of the percentages of suicides by race and gender. As illustrated, males in general and white males in particular committed the greatest percentage of suicides in 2017.



**Figure 18:** Suicides categorized by race and gender.

As shown in **Figure 19**, most suicides were committed by people between the ages of 19 and 29.



**Figure 19:** Suicides by age group.

In 2017, the predominate suicide methods were firearms (67), strangulation asphyxia (25), and drug toxicity (17) [Figure 20].

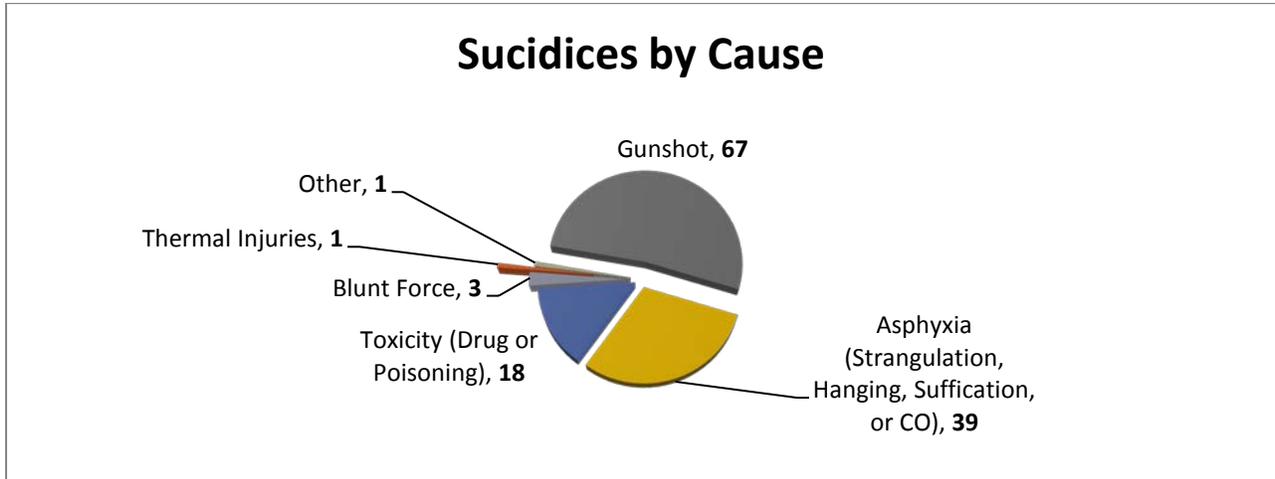


Figure 20: Suicides by cause.

## TOXICOLOGY

In 2017, there were 742 pathology cases submitted to the toxicology laboratory. Not all cases require toxicological analyses [Figure 21]; the majority of these are associated with extended hospital stays following the initial event and no suitable specimens available for testing. As a result, six hundred ninety three (693) of the seven hundred twenty eight (728) pathology cases submitted to the toxicology laboratory were analyzed.

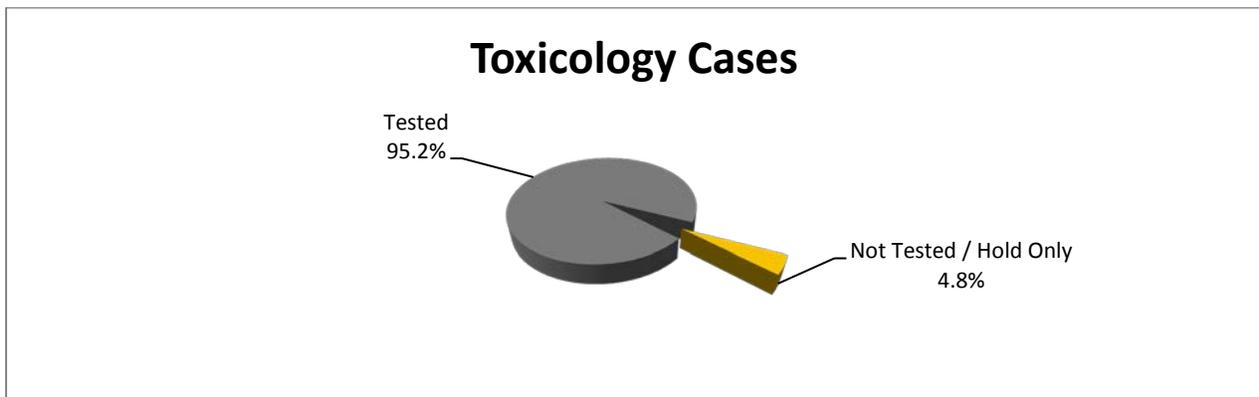
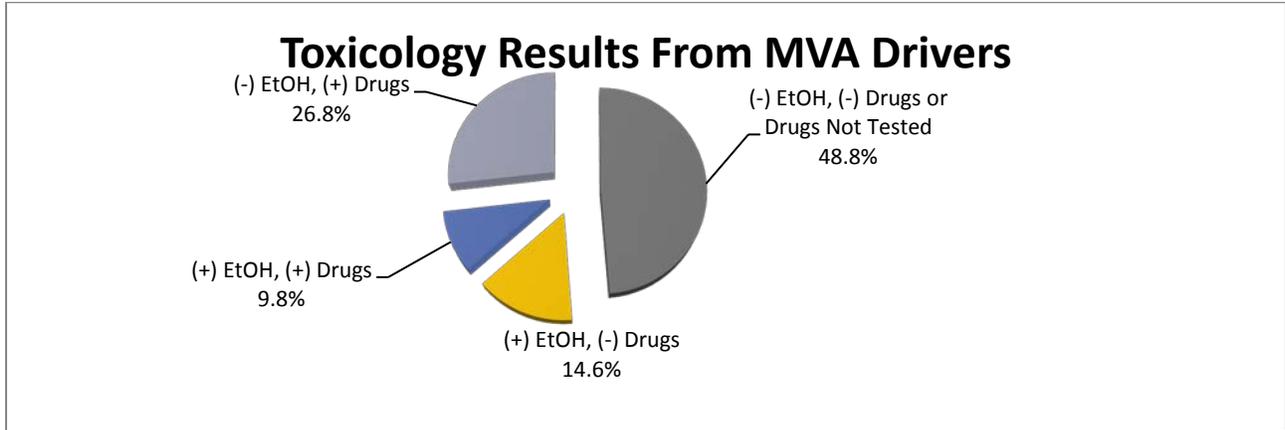


Figure 21: Percentages of cases submitted to the Toxicology Laboratory that were tested versus non tested.

In 2017, there were specimens from forty-three (43) post-mortem cases submitted for testing to the toxicology laboratory from drivers of motor vehicle deaths. [Figure 22] depicts the results of testing for Ethanol (EtOH), Tetrahydrocannabinol (THC) / Carboxytetrahydrocannabinol (THCA), and other drugs. Approximately 51% of fatally injured drivers had alcohol and/or drugs in their system. As shown in the figure, tests resulted in ten (20) drivers testing negative for EtOH and negative for drugs, three (6) were positive for EtOH and negative for drugs, two (4) were positive for EtOH and positive for drugs, and seven (11) were negative for EtOH and positive for drugs. Four (2) cases were not analyzed due to delayed death.

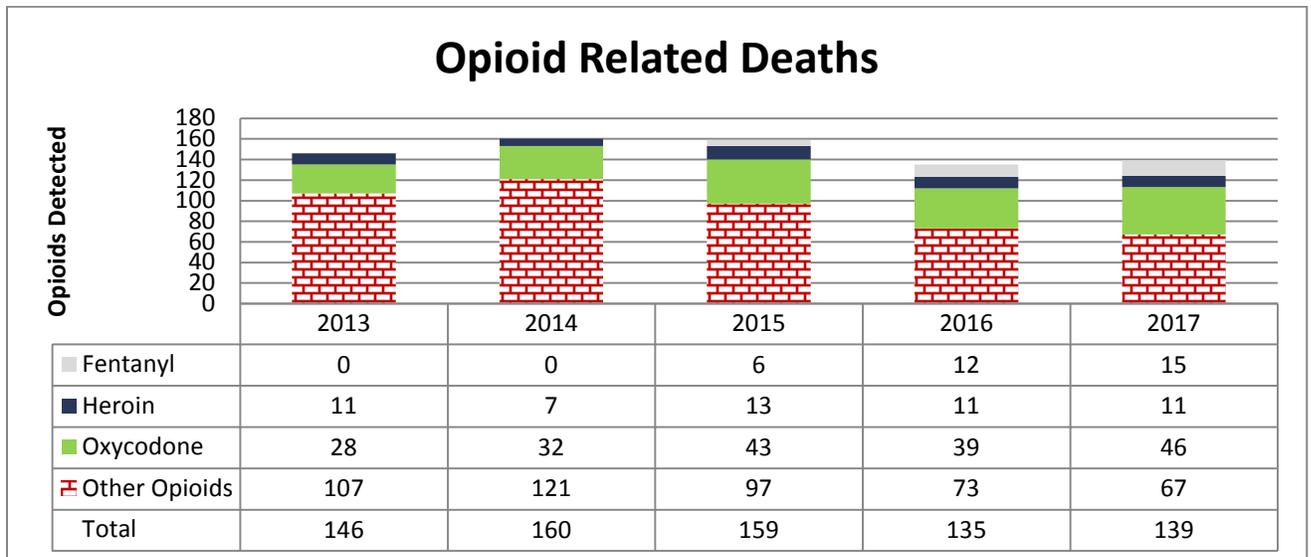
Of the EtOH positive blood specimens, five (5) resulted in values of 0.24 gm% or higher range and three (3) in the 0.16 to 0.23 gm% range, and three (3) in the 0.08 to 0.15 gm% range.



**Figure 22:** Alcohol and drug results from fatally injured drivers.

## OPIOID RELATED DEATHS

Opioid deaths remained high for 2017 with a total of 139. The range of opioid related deaths over the past five years is 135 to 160 with an average of 148 deaths. In 2016, designer opioids (Despropionylfentanyl, Furanylfentanyl, and U-47700) were detected in specimens from two cases, none were detected in 2017 submitted specimens. **Figure 23** provides the count of opioid related deaths broken down into four categories (Fentanyl, Heroin, Oxycodone, and Other Opioids). Note that fentanyl data was not captured separately prior to 2015, and that all fentanyl positive cases for 2013 and 2014 are included in the other opioids case count.



**Figure 23:** Opioid related deaths detected in Postmortem Toxicology cases.

## DESIGNER DRUGS

Designer or synthetic drugs are drugs manufactured to chemically resemble illicit drugs. The manufactures of these drugs are constantly changing the chemical structures in an attempt to circumvent drug law, which necessitates the Toxicology Laboratory to update methods of detection in order to identify them in casework specimens. In 2017, designer drugs (25I-NBOMe, Etizolam, and Flubromazolam) were detected in specimens from two cases.

## **Acknowledgments**

Statistical information was compiled by Robert C. Hansen II and reviewed by Shari Beck and Timothy S. Gorrill, M.D., Ph.D. The report was approved by Timothy P. Rohrig, Ph.D.