Office of the Medical Examiner

2018 Annual Report

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2018 Executive Summary

In this fourth annual report, we continue to summarize the statistics and trends in Maricopa County with regard to unexpected and non-natural deaths in our community. This year, drug-related deaths continued to be the most common category with those involving fentanyl, a powerful opioid available through legal and illegal means, doubling for the third year in a row. The rate of infant deaths dropped thanks to fewer unsafe sleep related deaths.

Accreditation

In 2013, the Office of the Medical Examiner (OME) began working toward agency accreditation by the National Association of Medical Examiners (NAME). This accreditation program ensures facilities, policies, procedures, staffing, and turn-around-times are meeting industry standards for excellent medicolegal death investigations. The agency achieved provisional accreditation in 2016 and evolved to full accreditation in 2018 after on-boarding two additional physicians, right-sizing the number of Forensic Pathologist Medical Examiners who lead these investigations. We are proud of this accomplishment and grateful for the patient support of the County Board of Supervisors, County Managers, stakeholders, families, and the public we serve.

Family Advocate

The deaths that OME investigates are, by definition, sudden, unexpected, and/or traumatic in nature and are especially difficult for the bereaved loved ones left behind. The staff of OME must remain objective and be methodical in their work; this wall of objectivity also protects them, to an extent, from the challenging circumstances and tragic stories they encounter every day. A national shortage of physicians trained in Forensic Pathology causes cases that could be concluded in weeks to take months. These realities can add burdens to the bereaved.

In 2018, OME developed a Family Advocate position, a social worker with expertise in communicating with those experiencing grief, together with a customer communication plan that allows contacts to be routed to her and tracked, ensuring she can provide proactive communications to those who need it. She gathers resource contacts to provide to families so they can receive support, provides investigation status updates, and arranges for calls or meetings with the physician Medical Examiners to help answer families' questions.

On-Demand Case Lookup

The availability of the agency's work-product, the Medical Examiner Report, and the cause and manner of death determination are the most common reasons families and stakeholders reach out to OME. In an effort to allow our customers to self-serve and to provide less resource-intensive, yet more responsive service, OME implemented a case lookup feature on its website.

Agency Mission, Vision, and Core Values

Mission

The Mission of the Medical Examiner is to provide professional medicolegal death investigations of individuals dying under statutorily defined circumstances, the results of which are communicated independently to relevant agencies, industries, and members of the public so they can receive accurate, timely, and effective communications that enhance the public's safety and health.

Vision

To be recognized as a trustworthy source of accurate, scientifically based assessments of deaths in our community by having certified practitioners perform industry-standard professional death investigations, in an industry-accredited organization.

Core Values

Service - We hold service to be the highest of values. We commit to effective, positive, ethical, and compassionate service to all members of the public and to one another.

Integrity - We commit to being professional and courteous in all our interactions, both with the public we serve and with each other. We commit to being honest, ethical, and diligent -- to do our best. We commit to being personally accountable for our words and actions and to help cultivate an organization of integrity by expecting the same of others. We do the right thing, even when no one is watching.

Compassion - We commit to being empathetic, both to the public we serve and to one another, to be mindful of our speech and actions and how they may affect others. We recognize that honest, kind communication, even in the face of conflict, is an act of compassion.

Positivity - We recognize that our perspective is critical to our attitude and that realistic assessments do not require negativity. We commit to approaching challenges with a positive attitude.

Adaptability - We recognize that nothing is constant. We commit to seeing the positive in change, that it is an opportunity for improvement.

Teamwork - We recognize the critical importance of other members of our department and of those outside our department with whom we work – we all have a role to play on the team. We commit to cultivating a positive, collaborative, service and solutions-oriented environment by working together.

Boundaries - We recognize that we must speak and act within certain bounds, that in order to be effective as a team we must focus on doing our best in our role on the team. We commit to working diligently within the bounds of our roles, being mindful not to attempt to take on inappropriate roles or to judge or undermine those in other roles.

Introduction

The Maricopa County Office of the Medical Examiner (OME) is a statutorily required county agency that provides medicolegal death investigations to help protect the public's health and safety. A medicolegal death investigation is a medical investigation of a death that is required under law. Each state has its own criteria defining which deaths must be evaluated by its medicolegal death investigation system. Arizona's system, like many others in the United States, is based around the Model Postmortem Examinations Act of 1954, which listed circumstances of death that should be investigated in order to best protect the public's interest. These circumstances are generally deaths that are non-natural, violent, traumatic, and/or sudden and unexpected in previously healthy individuals.

Arizona's medicolegal death investigation system is county-based and is a Medical Examiner (ME) system. Each county is required to appoint either a County Medical Examiner or Alternate Medical Examiner. A County Medical Examiner must be a Forensic Pathologist, a licensed physician who is trained in evaluating individual deaths for the determination of cause of death and in order to answer other anticipated questions. If a Forensic Pathologist is not available to serve a county in such a fashion, the county may appoint an Alternate Medical Examiner who does not have to be a Forensic Pathologist, but must be a licensed physician; this type of Medical Examiner can direct the death investigation, but cannot perform forensic autopsies.

Medicolegal death investigations follow a medical model wherein a physician collects a history of events; medical, social, surgical, and occupational histories; and combines these historical data with observations from the scene of death and a postmortem examination of the body, typically an autopsy, to form conclusions about what injuries and/or diseases significantly contributed to the death. After examination, laboratory testing is frequently ordered to answer targeted questions, particularly those around drug use. At the conclusion of the investigation, a Medical Examiner Report is authored that details the observations and findings.

In cases requiring investigation, the Medical Examiners are also responsible for certifying the cause and manner of death on the Death Certificate (DC). This is typically done on the day of the examination. The Death Certificate contains valuable data for public health statisticians to compile and analyze for trends. These analyses support public health and safety interventions by agencies and institutions working within many different societal systems including healthcare, transportation safety, occupational safety, and public health. If a cause or manner of death conclusion cannot be reached at the time of examination, the Medical Examiner may list them as "pending" and amend the Death Certificate once additional investigation has been concluded and the results analyzed.

In addition to answers that are provided to the family of the deceased, many agencies use the results of the medicolegal death investigation in order to guide their own missions. The Medical Examiners and other OME staff are frequently called to testify in criminal and civil litigations. They share data with partners in the Public Health System so patterns can be identified and interventions can be implemented. They report deaths to safety agencies so they may assess the safety of means of transportation, occupations, and consumer products.

The work done by our staff is challenging and we are grateful for the dedicated people who do it, day in and day out.

Organization of the Office of the Medical Examiner

The Office of the Medical Examiner (OME) is divided into Departmental Sections based on services:

Medical Examiner – Includes the Board Certified Forensic Pathologist Medical Examiners (MEs), two Forensic Pathologists with additional training and Board Certification in Neuropathology, a Forensic Anthropologist, and a Forensic Odontologist.

Investigations – The team of American Board of Medicolegal Death Investigators (ABMDI) certified Medicolegal Death Investigators (MDIs) who conduct interviews, collect records and histories, and evaluate scenes. They are the eyes and ears of the MEs and are most often the face of the agency, interacting with other agency partners and the public.

Examinations – Forensic Technicians (FTs) provide technical support for the examination of bodies admitted to OME's facility, performing radiographs, taking photographs, and aiding in autopsy dissections.

Photography – Forensic Photographers provide technical photography on a large subset of cases including homicides and those cases needing alternate light source and other specialized photography. They also train other staff who take photographs in the course of their duties.

Laboratory – In-house, American Board of Forensic Toxicology (ABFT) accredited toxicology laboratory, in-house histology for preparation of microscopic slides, and specimen handling in collaboration with outside labs for microbiology, serology, and other special testing.

Admitting – Case Information Specialists (CISs) admit and release bodies from the facility, perform data entry and validation for the case management database and electronic Death Certificates.

Administration and Administration Support – Provide business support, reception, scheduling, records management, transcription services, and data entry and validation for electronic Death Certificates.

2018 Organizational Chart

Jurisdiction of the Medical Examiner

Not all deaths that occur in Maricopa County require reporting to or investigation by the Medical Examiner. The majority of natural deaths are certified by the individual's healthcare provider. Arizona Revised Statutes (A.R.S.) require deaths falling under certain circumstances to be reported to the Office of the Medical Examiner (OME) by any individual knowing of the death. Upon a report of death, Medicolegal Death Investigators (MDIs) will make an initial inquiry to determine if the circumstances meet statutory requirements. If so, OME takes jurisdiction of the medical death investigation and responsibility for certifying the cause of death and manner of death on the Death Certificate. Cases in which jurisdiction is declined are released to healthcare providers to medically certify the death.

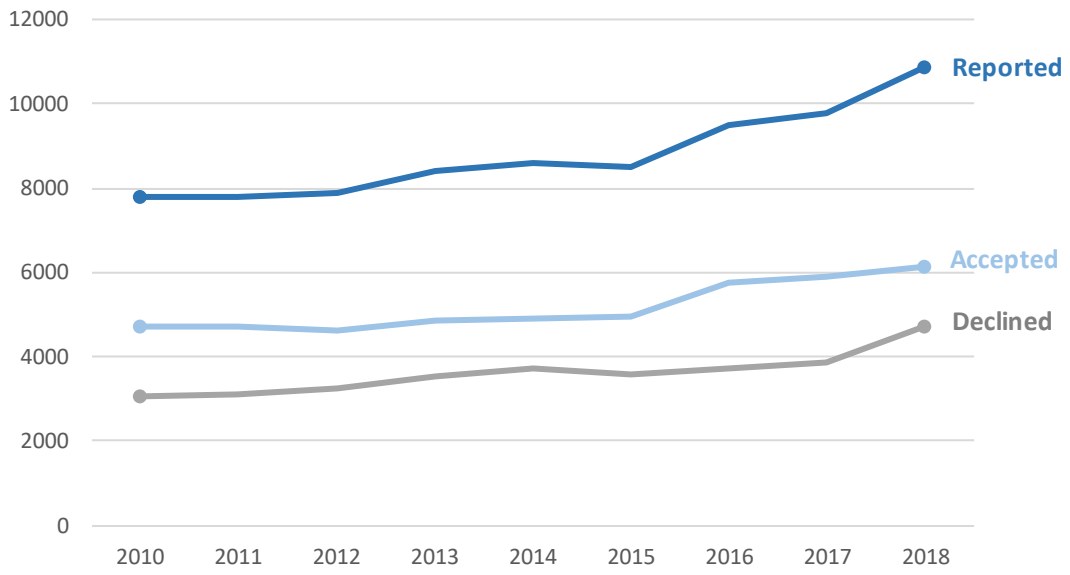
The circumstances under which deaths have to be reported are found in A.R.S. §11-593 B.:

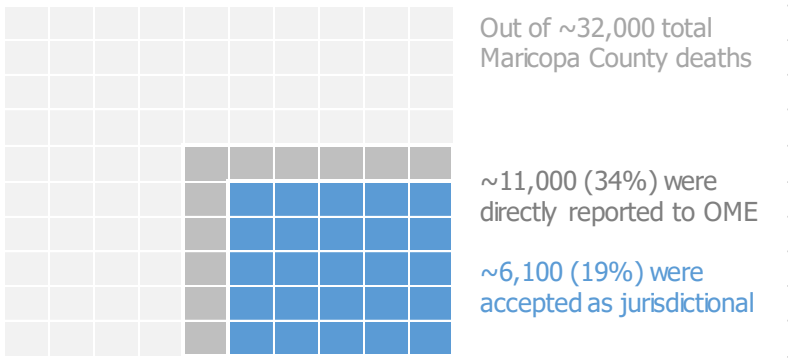
1. Death when not under the current care of a health care provider as defined pursuant to section 36-301.
2. Death resulting from violence.
3. Unexpected or unexplained death.
4. Death of a person in a custodial agency as defined in section 13-4401.
5. Unexpected or unexplained death of an infant or child.
6. Death occurring in a suspicious, unusual or nonnatural manner, including death from an accident believed to be related to the deceased person's occupation or employment.
7. Death occurring as a result of anesthetic or surgical procedures.
8. Death suspected to be caused by a previously unreported or undiagnosed disease that constitutes a threat to public safety.
9. Death involving unidentifiable bodies.

Deaths Reported and Jurisdictional Dispositions

In 2018, 10,850 deaths were **reported** to OME. Of these, 6,124 (56%) met statutory jurisdictional criteria and were **accepted** as jurisdictional cases. In the remaining 4,726 deaths, jurisdiction was **declined** and the Death Certificate was medically certified by one of the individual's healthcare providers.

When a death is reported, a certified Medicolegal Death Investigator (MDI) will make an initial inquiry to determine if the circumstances align with the statutory requirements for OME to take jurisdiction, documenting these facts in a Preliminary Investigative Report (PIR). If they align, they will accept jurisdiction of the case and begin the formal investigation. If they do not, they will decline jurisdiction. On-call Medical Examiners review the declined cases daily to ensure agreement with the decision.

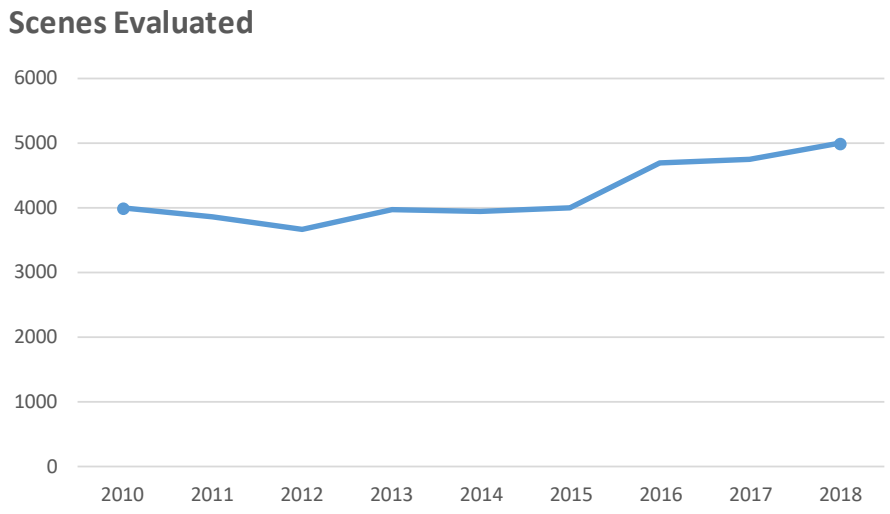


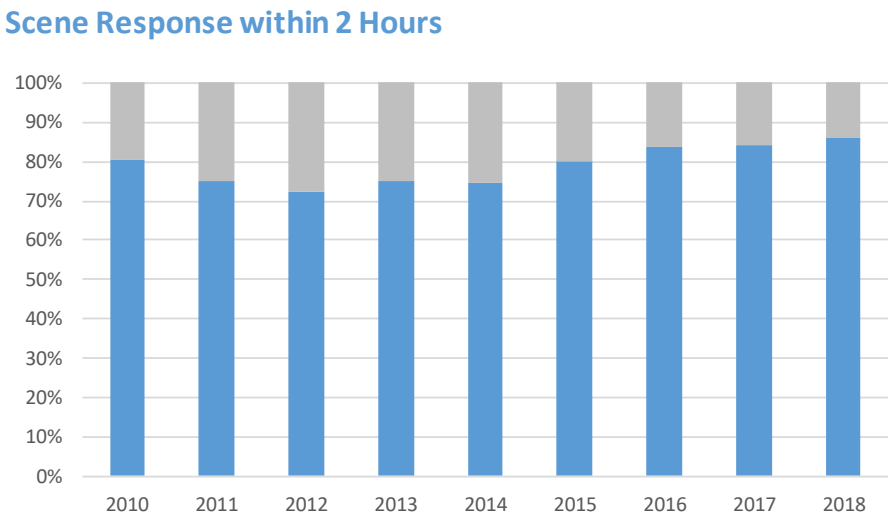


Scene Evaluations and Transportation

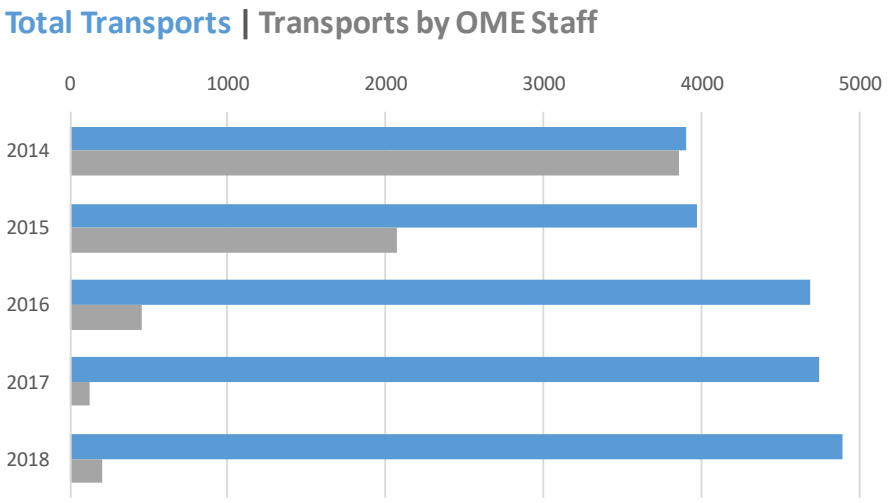
In order to accurately investigate a death, Medicolegal Death Investigators (MDIs) will conduct interviews and collect and review records. In most cases, an evaluation of the incident and/or death scene is critical to determining the underlying cause of the death or in answering anticipated questions.

In 2018, MDIs responded to 4,995 incident and/or death scenes for evaluation. Eighty-six percent (86%) of responses were within 2 hours.





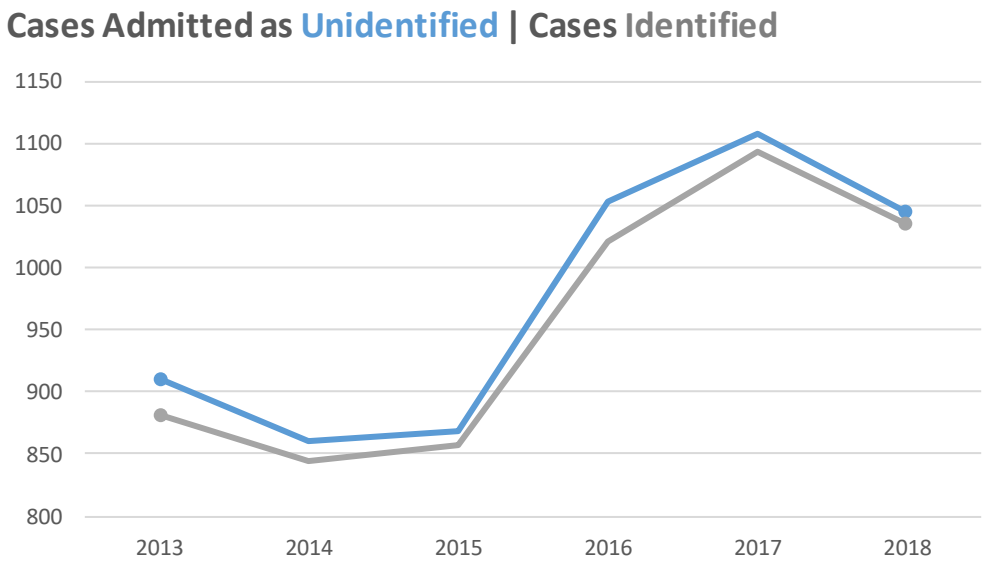
The OME began utilizing an external transport service in 2015, freeing up certified MDIs for scene evaluations, history gathering, and follow-up investigations.



Unidentified Remains

Determining identity of the remains is one of the first steps in a medicolegal death investigation. A variety of methods are used at OME to research and confirm a decedent's identity. If the identification is in question at the time the body is admitted, a specialized team including a Senior MDI Identification Coordinator, Forensic Odontologist, Forensic Anthropologist, Forensic Technicians with advanced fingerprinting training, and the assigned Medical Examiner work together to verify the identity of the remains.

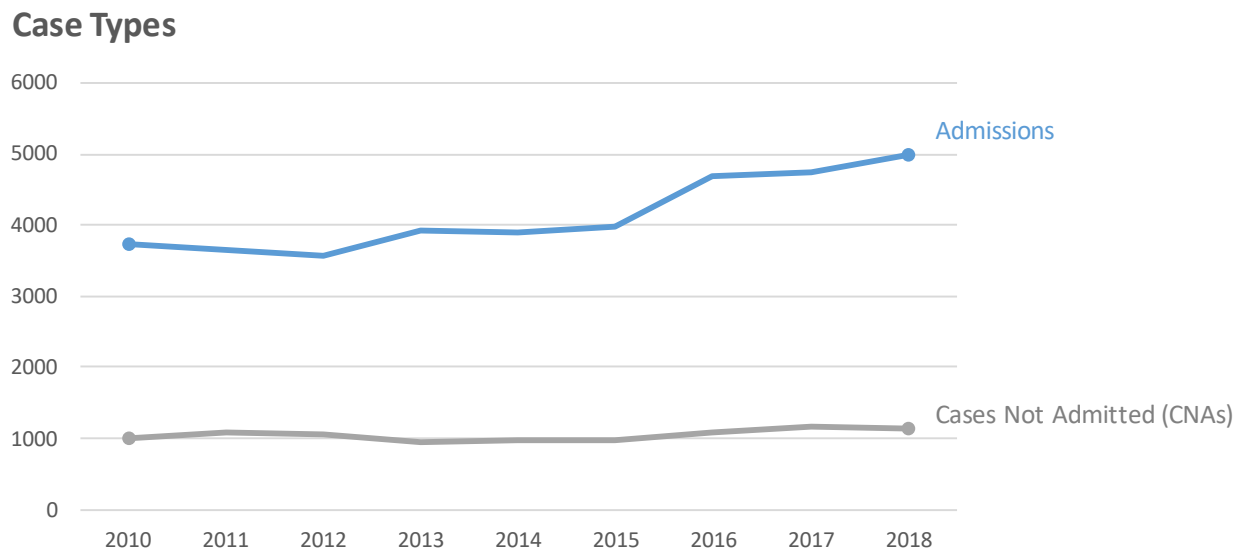
In 2018, 1,045 cases were admitted as unidentified and 1,035 cases were positively identified. Most identifications are resolved within days to weeks; however, in some cases no identification leads can be found and cases must be submitted to national missing persons databases such as The National Missing and Unidentified Persons System (NAMUS). Currently, 225 remains, including those dating back to the 1960s, still remain unidentified. The Identification Team continues to work with stakeholders to match these with missing persons and participates in Missing in Arizona Day each fall to attempt to gather leads.



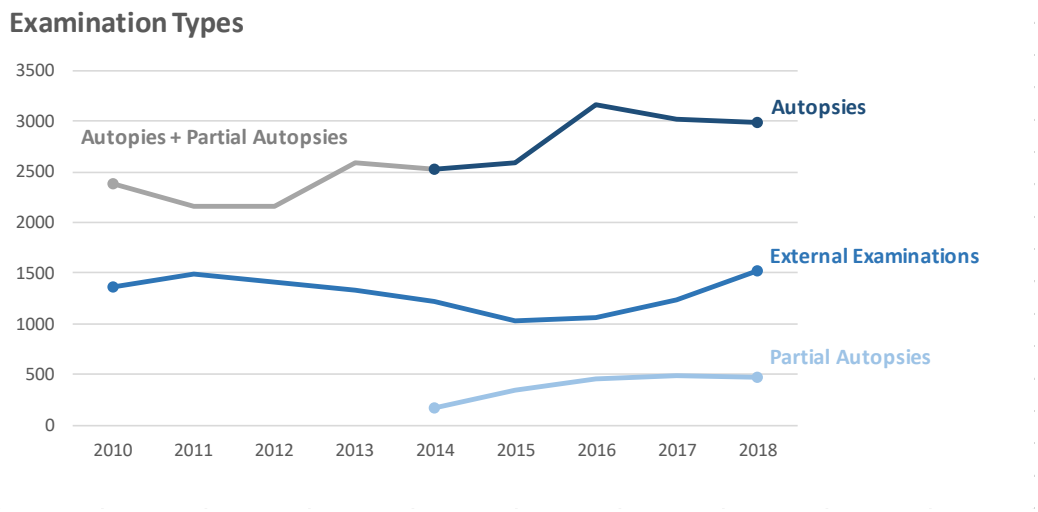
Case and Examination Types

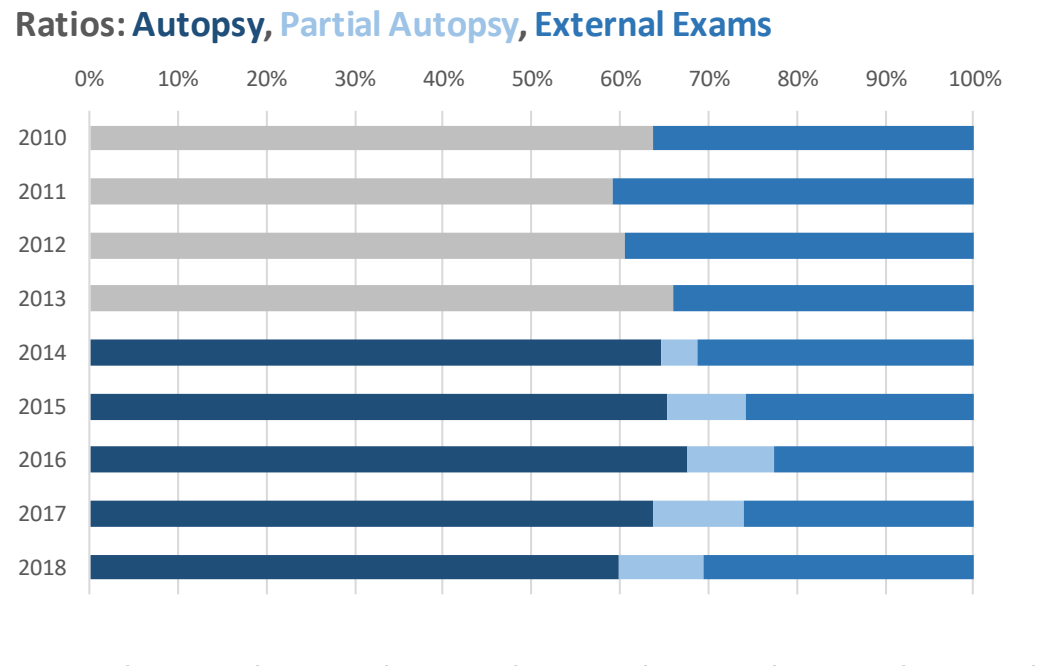
Medicolegal death investigations may involve only studying the history and circumstances surrounding the death or may also include examination of the body by a physician Medical Examiner. Those bodies that are admitted to the OME's facility undergo various types of examination depending on the needs of the investigation. The most common examination is a forensic autopsy which involves examining the external surfaces of the body and a detailed examination of the internal organs and tissues of the head, neck, and torso. Partial autopsies are typically those that limit the internal examination to the head. External examinations involve only examination of the external surfaces. In cases where examination of the body is unnecessary, the Medical Examiner will formulate conclusions based on a review of the records. These are designated Cases Not Admitted (CNAs).

In 2018, 4,996 bodies were **admitted** for postmortem examination and 1,128 cases were concluded through only record review (**CNA**s).



The types of postmortem examination, trends, and ratios are summarized below. *Note that OME's database did not capture partial autopsies until sometime in 2014 and prior years' autopsy counts include some unknown proportion of partial autopsies.

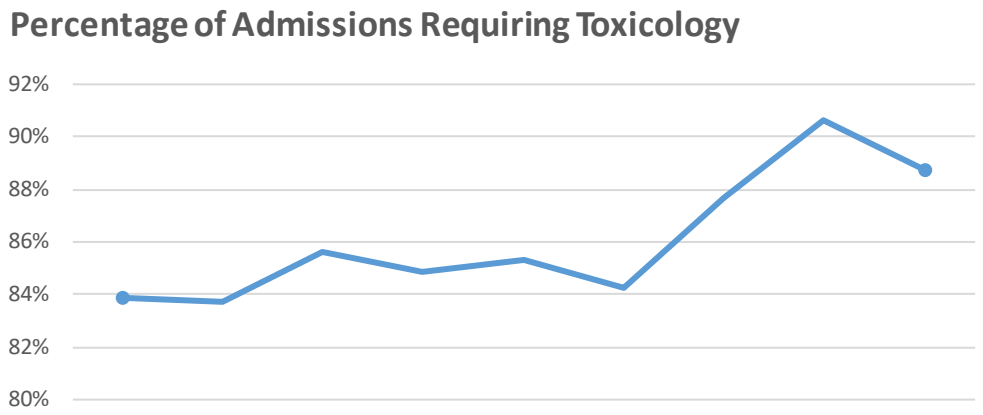


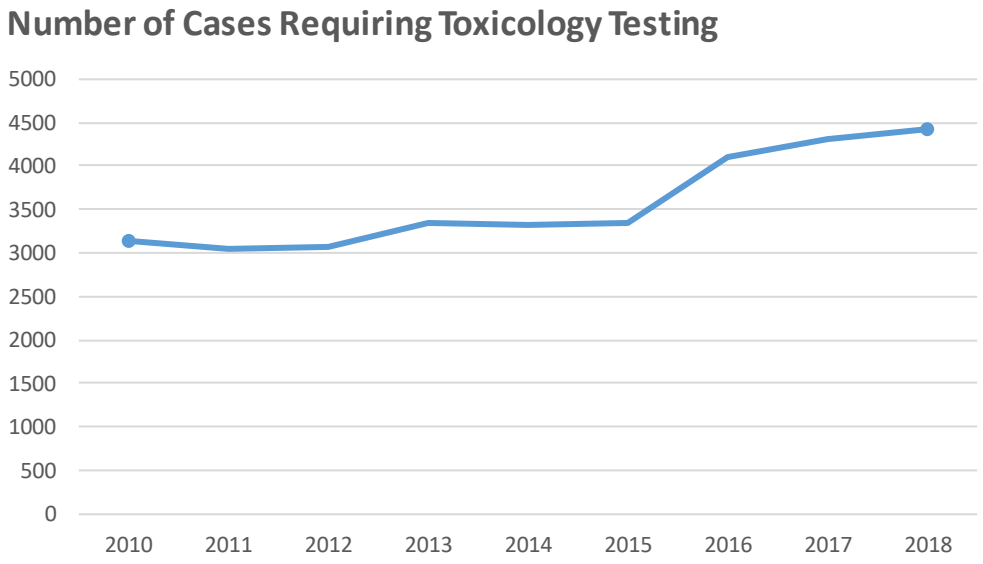


Laboratory Testing: Toxicology

After the examination of the body, the Medical Examiner may order laboratory testing to aid in determining the cause of death or to answer anticipated questions surrounding the death. The most common laboratory test in medicolegal death investigations is toxicology -- testing for drugs and poisons. Forensic Toxicology, unlike most toxicology testing in the healthcare setting, extends beyond screening for the presence of drugs, adding confirmation and quantification of the drugs. Additionally, special care is required as samples taken after death are prone to issues that can confound the accurate interpretation of the toxicology results.

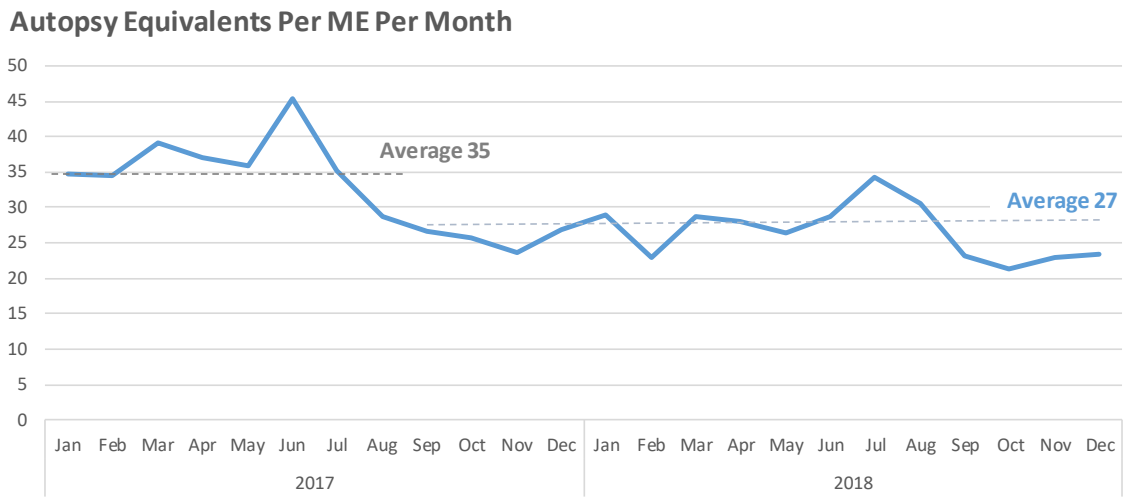
In 2018, 89% of cases undergoing postmortem examination had specimens submitted for toxicology testing.

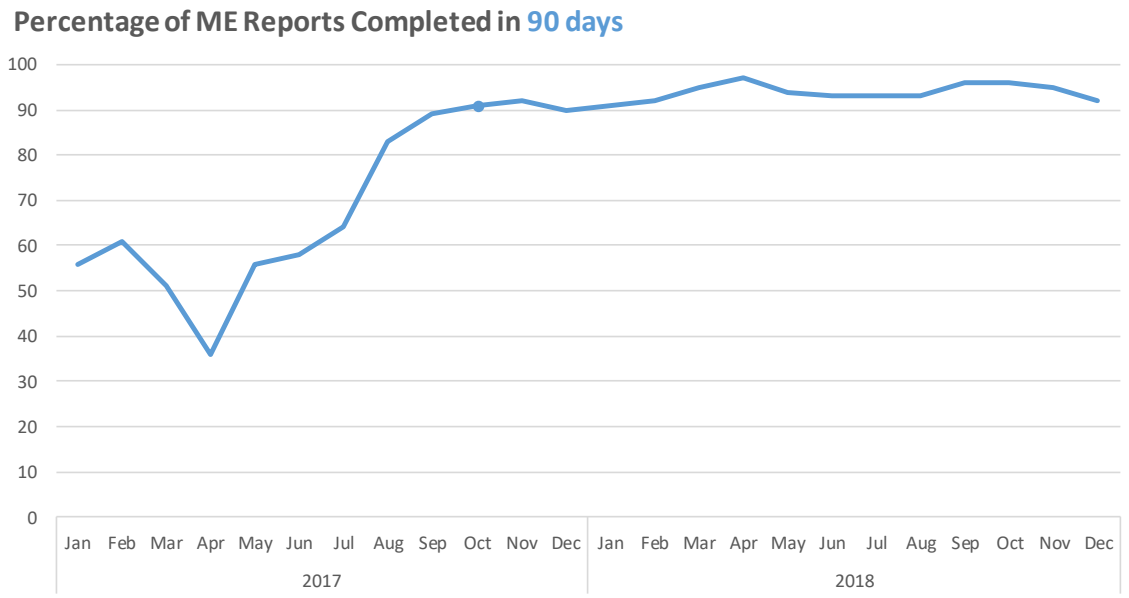




Medical Examiner Reports

The final work product of an investigation is the Medical Examiner (ME) Report. These reports are authored by the physician Medical Examiners to document their observations, a summary of the investigation, the findings, and their conclusions. In 2018, after 5 years of recruiting efforts, OME was able to right-size the physician staff for the workload according to industry standards. This allowed OME to perform the appropriate number of autopsy equivalents per capita (1 per 1,000) and to meet the standard timeframes for completion of the ME Reports (90% within 90 days of the postmortem examination).

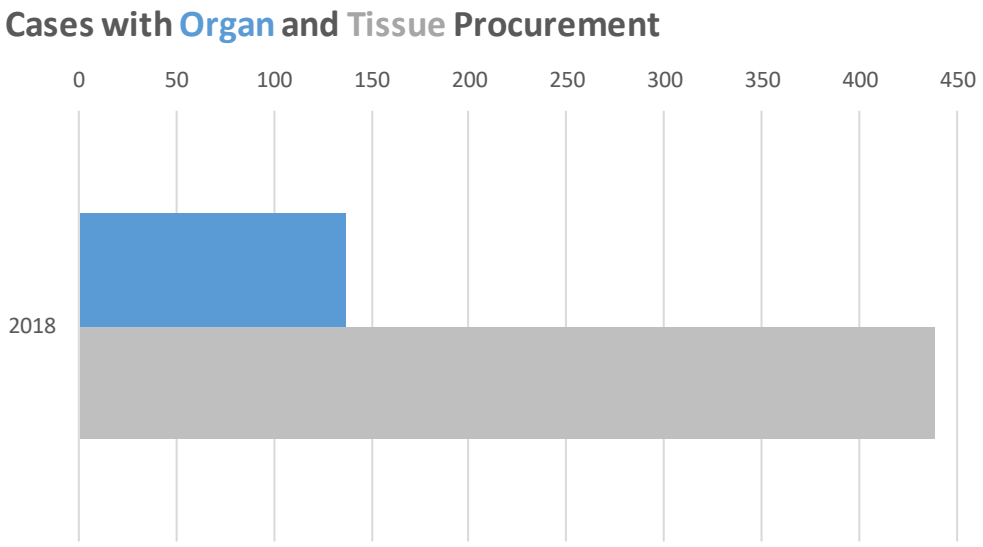




Organ/Tissue Donation

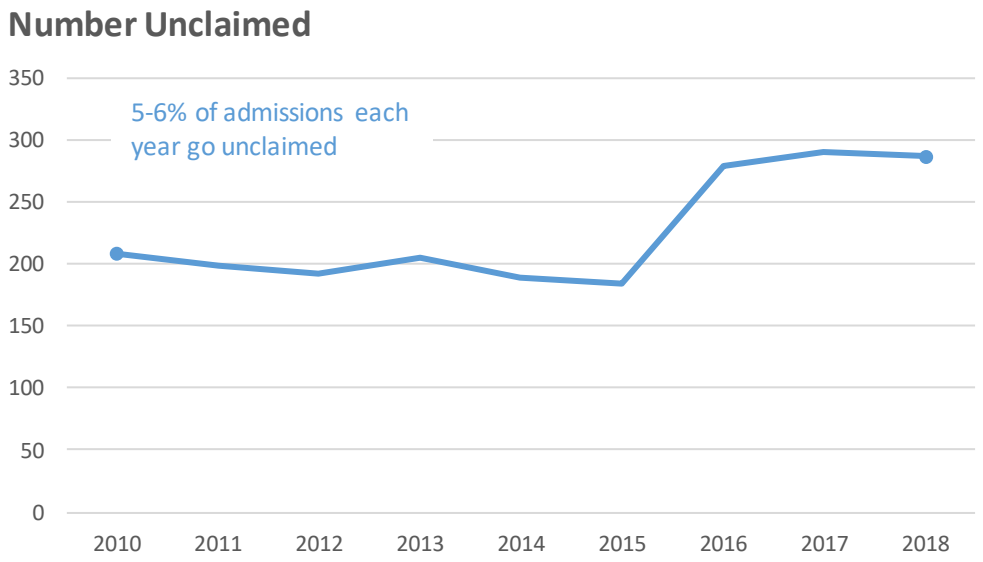
In medical examiner cases where the deceased or his/her family wish to make an anatomical gift of organ or tissue donation, OME is required to review and authorize those requests, balancing the requirements of the medicolegal death investigation with the life-saving and life-enhancing opportunities that such donations provide. The procurement of these anatomical gifts is not a function of the OME and is conducted by Organ/Tissue Procurement Organizations.

In 2018, 127 medical examiner cases had organs procured for donation and 439 had tissues, such as corneas and heart valves. These donations provided 534 organs for life-saving organ transplants and improved the quality of life for hundreds of others through cornea and tissue transplants.



Unclaimed Bodies

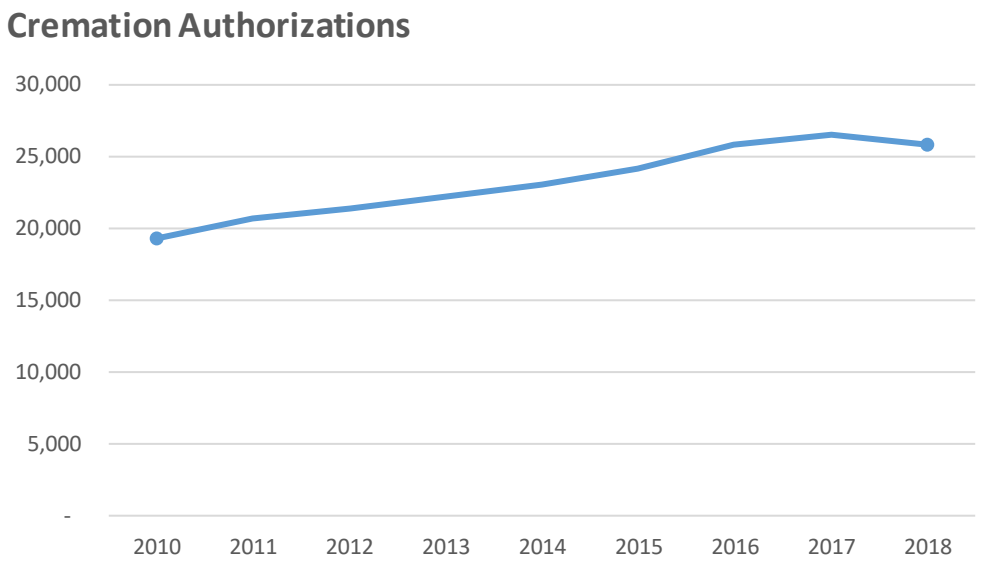
Each year, bodies may go unclaimed. The OME works with area Funeral Home partners to rotate release of those remains for final disposition in collaboration with Maricopa County Public Fiduciary.



Cremation Authorizations

In cases where the deceased or his/her family selects cremation of the remains, Arizona statute requires the Death Certificate be reviewed by the County Medical Examiner's office. This aids in capturing medical examiner cases that may have inadvertently not been reported to the office. Each day, a physician Medical Examiner reviews the Death Certificates requiring cremation authorization and approves those that do not represent previously unreported medical examiner cases. Case counts of cremation approvals also include the medical examiner jurisdictional cases which all receive cremation pre-approval at the time the medical certification is completed.

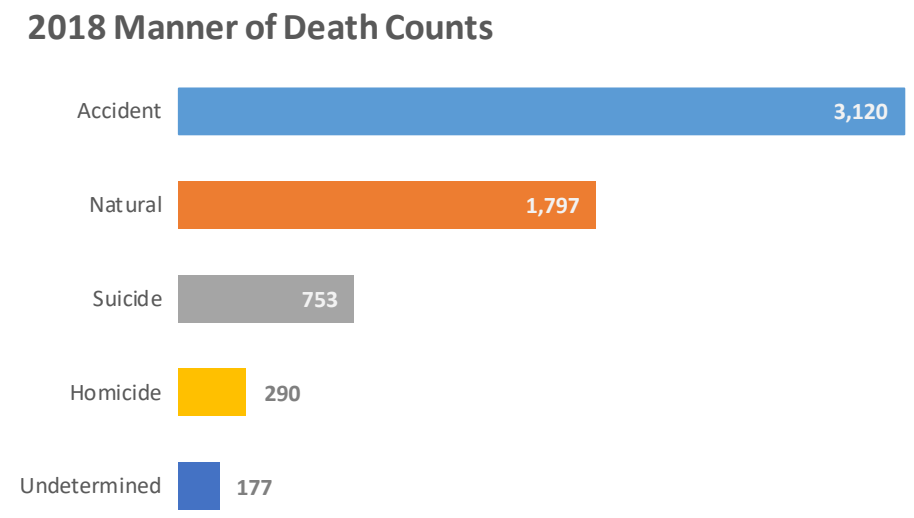
In 2018, OME authorized 25,823 cremation requests.



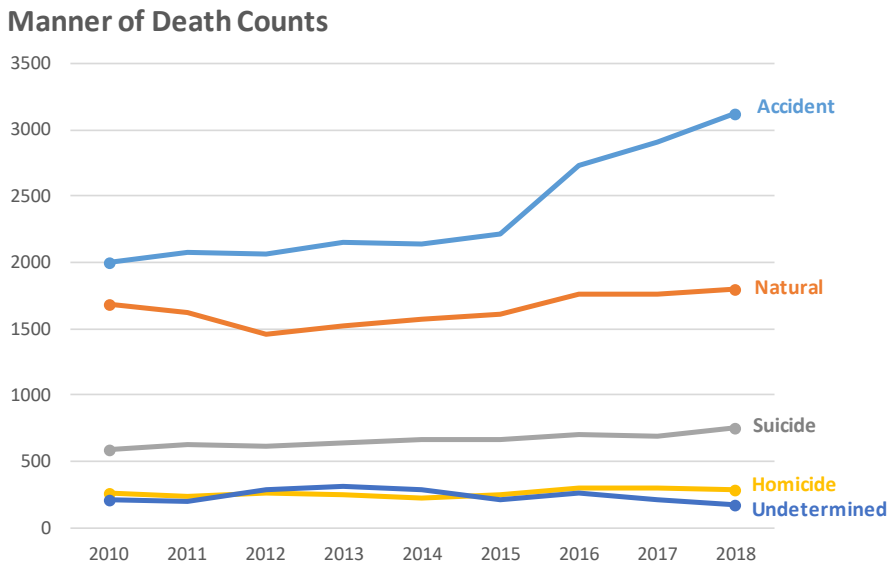
Manners of Death

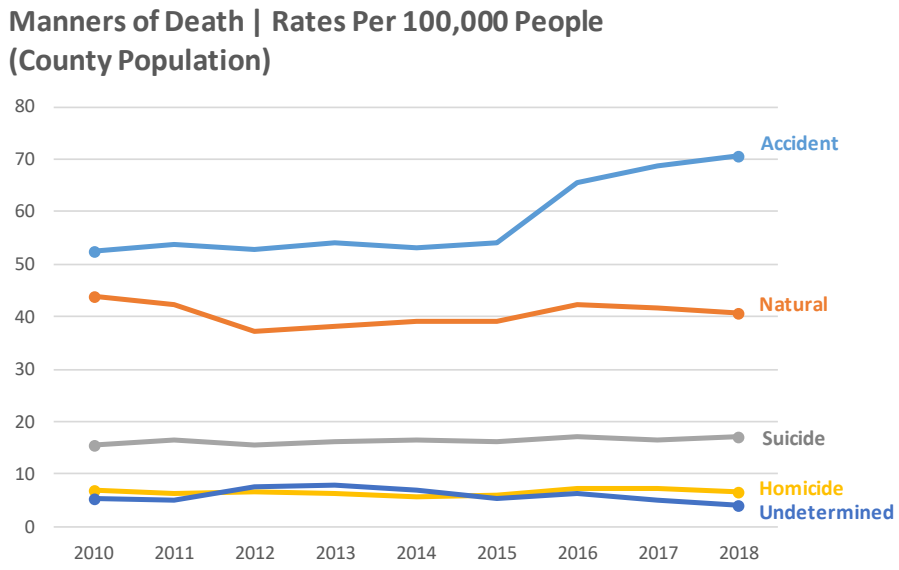
At the conclusion of the medicolegal death investigation, the Medical Examiner will document her/his findings and conclusions in a Medical Examiner Report. The report includes the Cause of Death (COD) and Manner of Death (MOD) listed in the medical certification of death lines on the Death Certificate. Both the Cause of Death and Manner of Death are bound by certain rules so that vital statisticians can code the cause and compile accurate statistics about deaths. The Cause of Death is ultimately the underlying disease, injury, or combinations thereof that lead to death.

The Manner of Death is a vital statistical classification to group certain circumstances of death. The choices for Manner of Death are Homicide, Suicide, Accident, Natural, and Undetermined. These Manner of Death determinations are medical determinations and are not to be confused with similar legal terms used by the judicial system; for example, a Homicide Manner of Death in a medical certification simply means death at the hands of another individual with some reasonably inferable intent to do harm; this type of death may or may not be categorized as murder by criminal justice officials.



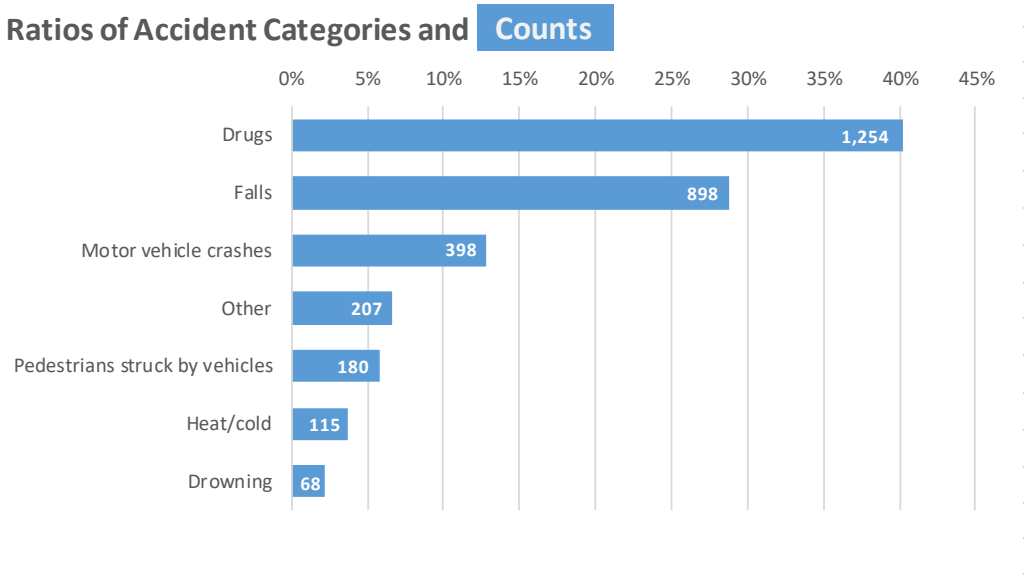
While Manner of Death counts affect the resource requirements in order to investigate these deaths, Manner of Death rates as a ratio of the number of deaths for each category relative to the population of Maricopa County each year are a better indicator of trends because they account for population growth. Rates since 2010 have been relatively flat except for accidents, which have increased greatly – a trend predominantly due to drug overdoses.

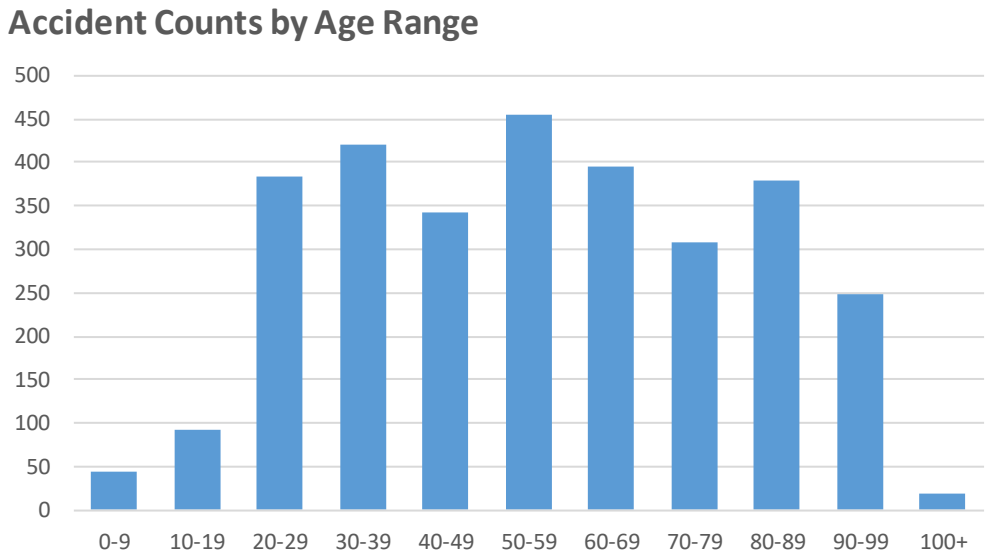




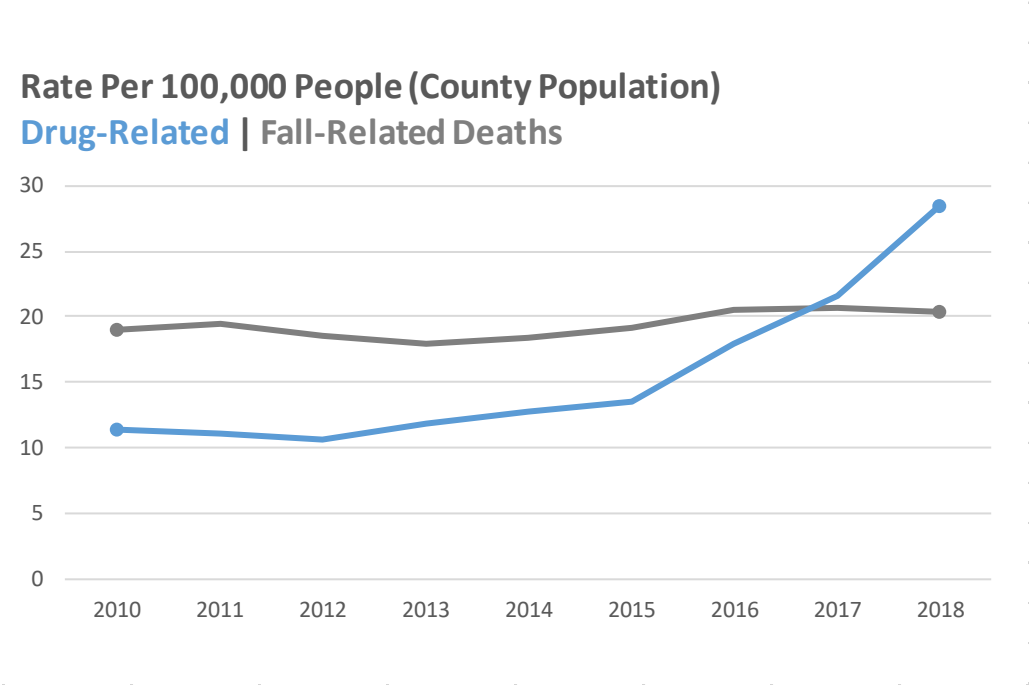
Manner of Death: Accident

In 2018, drug-related deaths again made up the majority of accidents with 1,254 cases (40% of all accidents).





While the rate per 100,000 people in Maricopa County of **fall-related deaths** has remained relatively flat as the population has grown, the rate of **drug-related deaths** has grown dramatically since 2015.



Manner of Death: Natural

The vast majority of Natural deaths occurring each year are certified by community health care providers and are not required to be reported to the Medical Examiner (93% in 2018); however, individuals without health care providers and deaths under certain circumstances (e.g. unidentifiable remains or sudden/unexpected deaths in previously healthy individuals) are investigated and certified by OME. The natural death counts in this report only refer to those cases that met medical examiner jurisdictional criteria and underwent full investigation by OME -- in 2018, there were 1,797 cases.

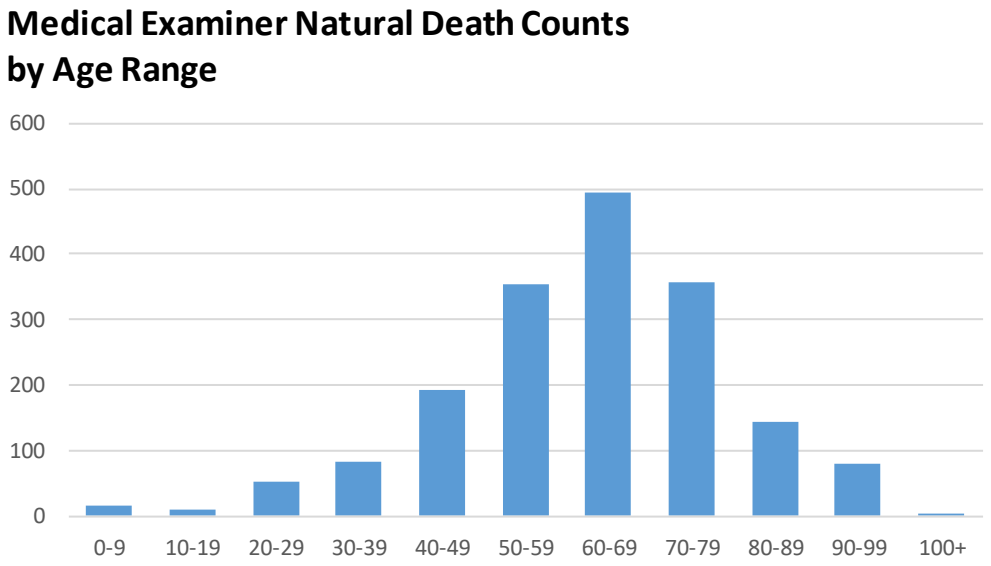
Natural continued to be the second most common manner of death in 2018. The Maricopa County Department of Public Health and Arizona Department of Health Services track health statistics that include collaborations with OME.

See the Maricopa County Department of Public Health website:

http://www.maricopa.gov/2528/Health-Data

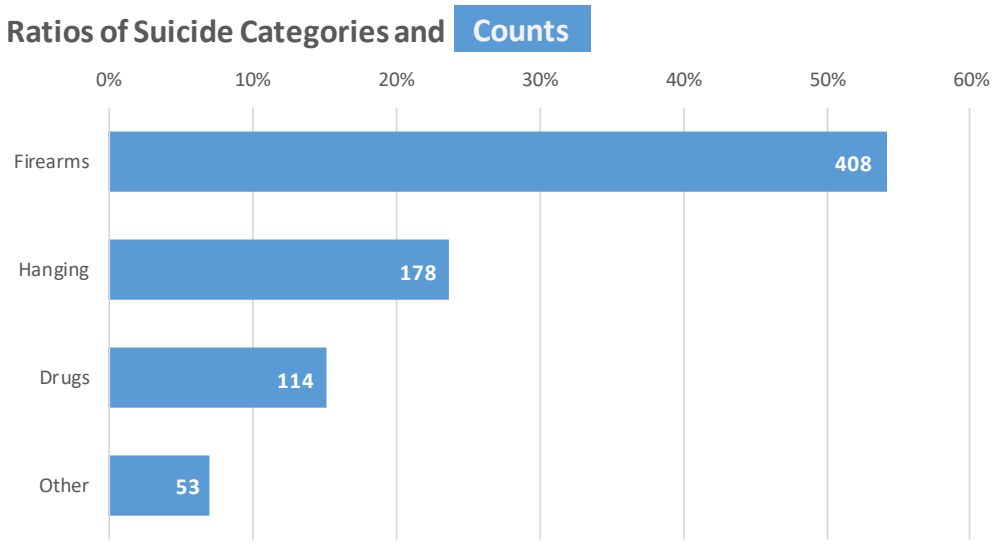
And the Arizona Department of Health Services website for details:

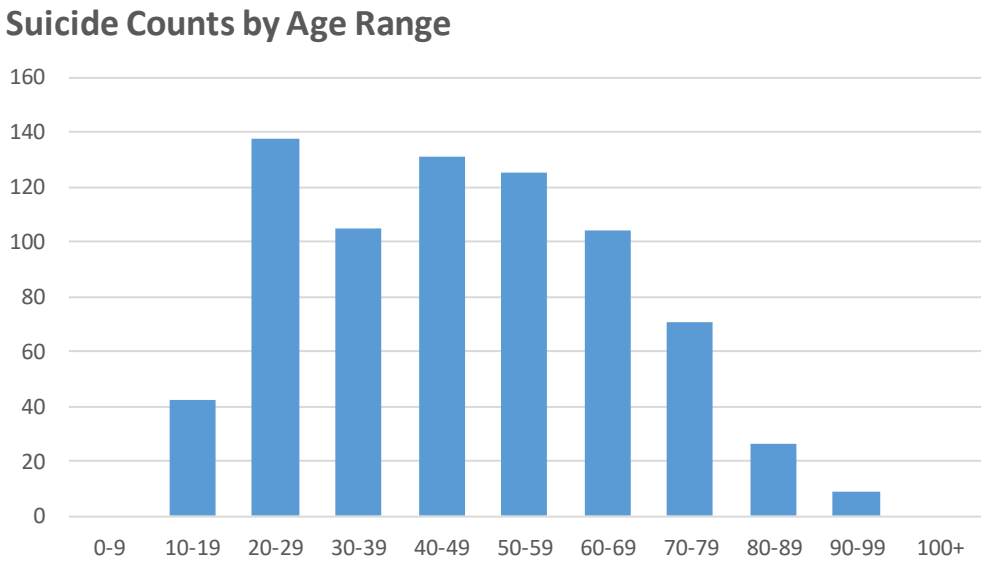
http://pub.azdhs.gov/health-stats/index.php

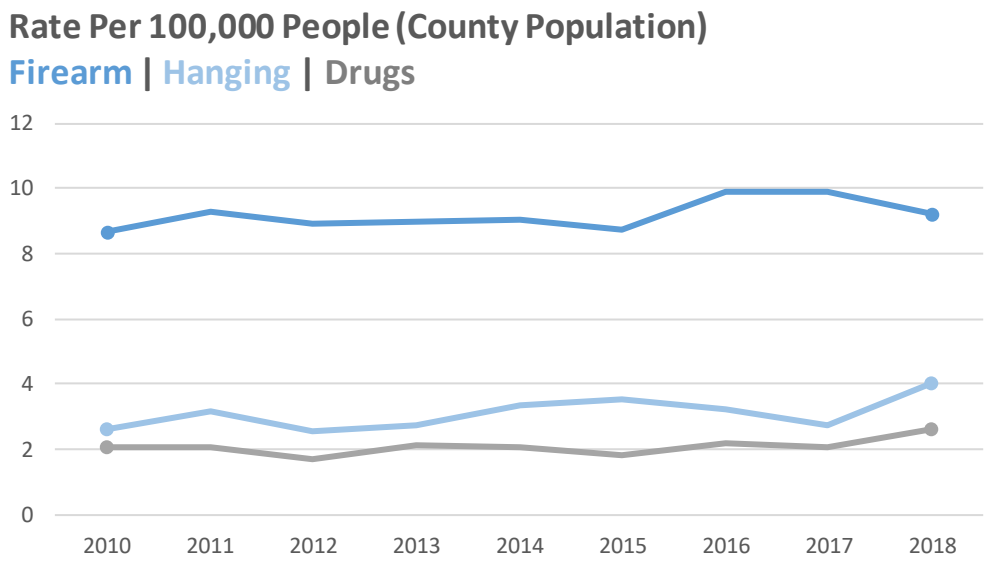


Manner of Death: Suicide

In 2018, 753 deaths were categorized as suicides. The majority were carried out with firearms.

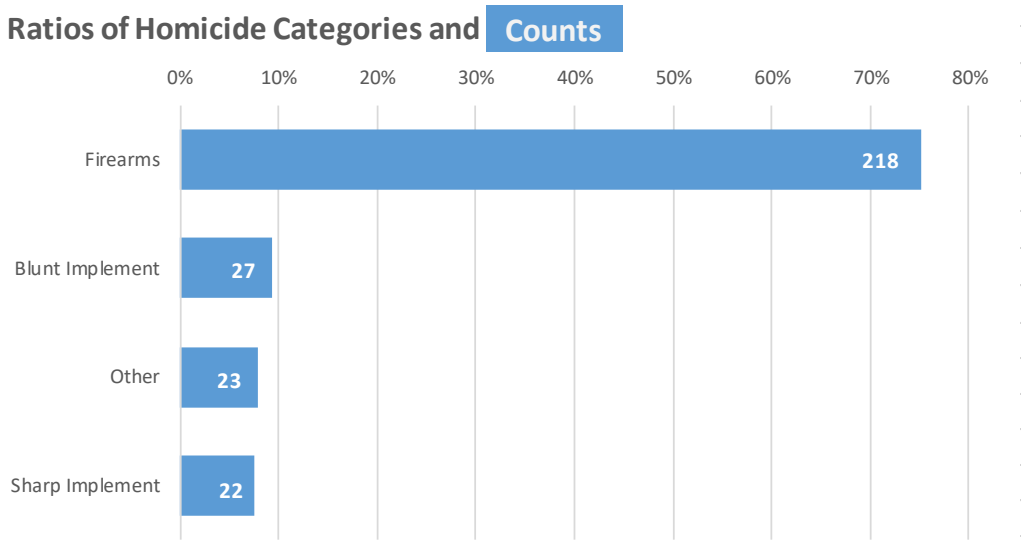


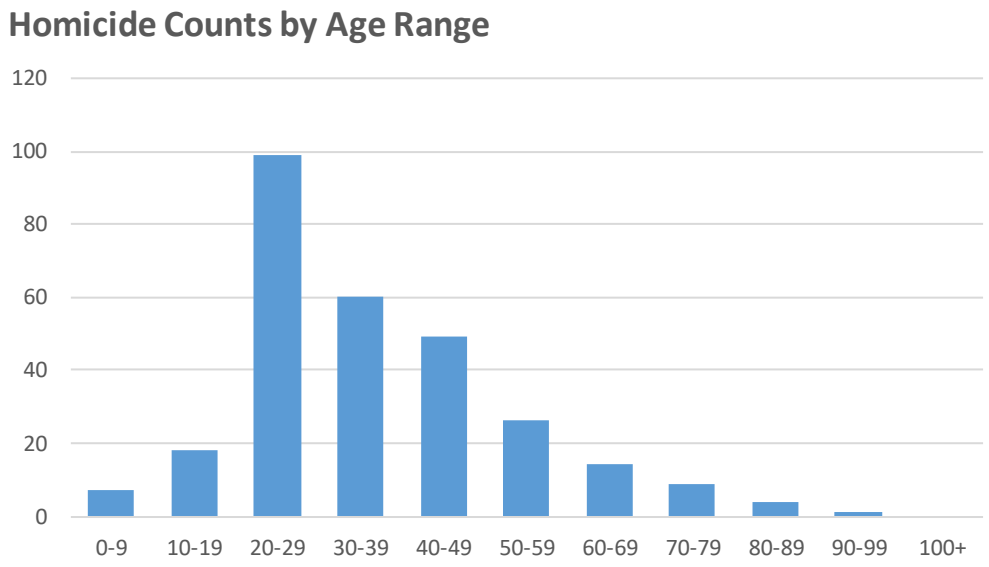


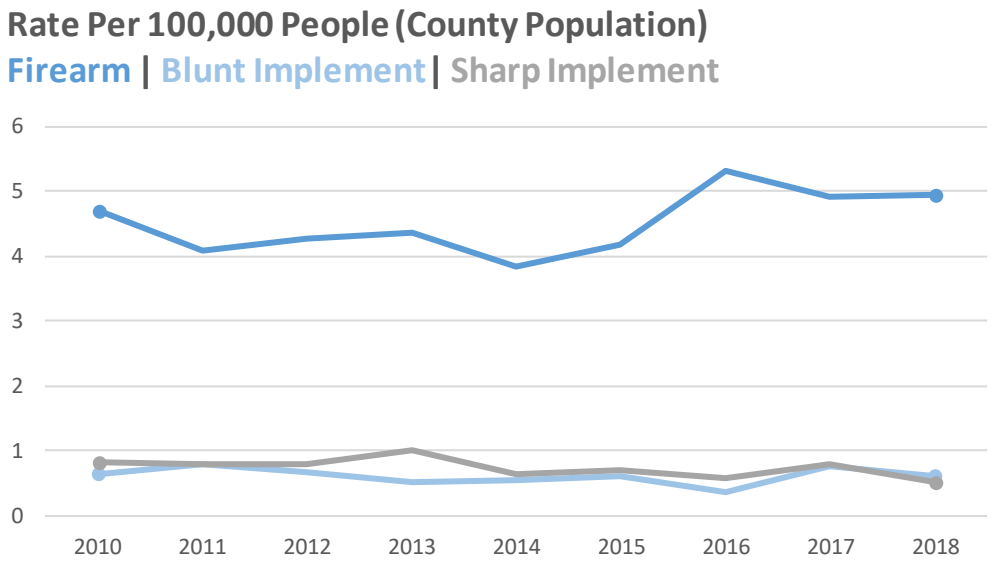

Rate Per 100,000 People (County Population)
Firearm | Hanging | Drugs
12
10
8
6
4
2
0
2010
2011
2012
2013
2014
2015
2016
2017
2018

Manner of Death: Homicide

There were 290 deaths classified as Homicides in 2018. The vast majority of Homicides were due to gunshot wounds.



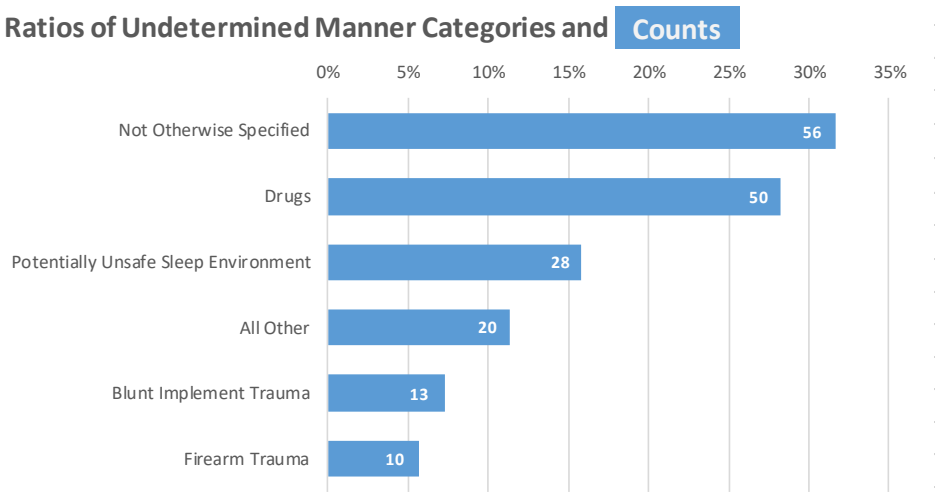


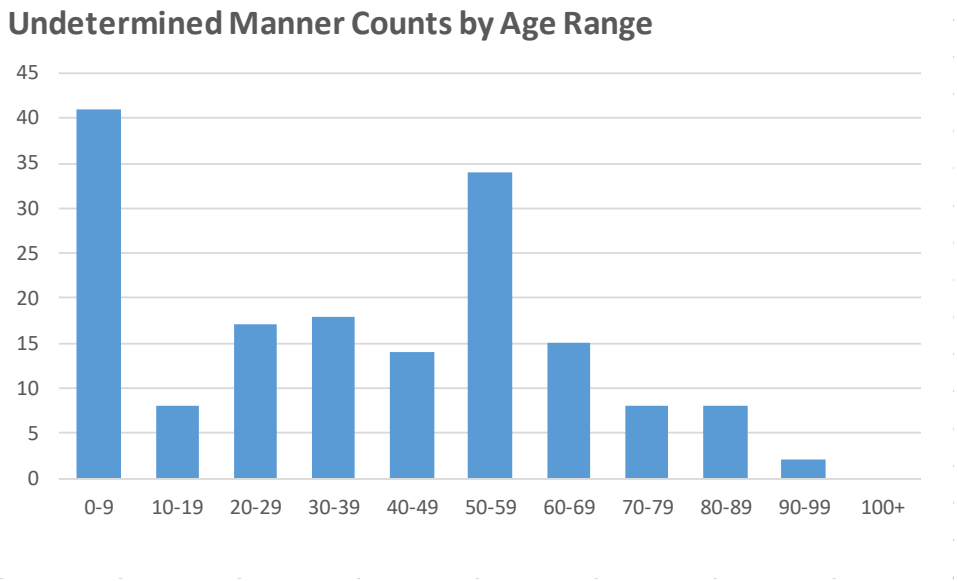

Rate Per 100,000 People (County Population)
Firearm | Blunt Implement | Sharp Implement
6
5
4
3
2
1
0
2010
2011
2012
2013
2014
2015
2016
2017
2018

Manner of Death: Undetermined

In some cases, a clear manner of death cannot be determined. This is typically due to a lack of available information (e.g. a drug intoxication death in an individual with past suicidal threats may be an accident or a suicide and there may not be enough information to arrive at a clear conclusion).

In 2018, two age groups had the most undetermined manners of death, 0-9 years and 50-59 years. The 50-59 year olds were predominantly drug-related deaths. In the 0-9 year-old age group (41 deaths), infants were most commonly represented; this is typical, as many infant deaths have no circumstantial, anatomic, laboratory, or scene findings to conclusively explain their deaths.

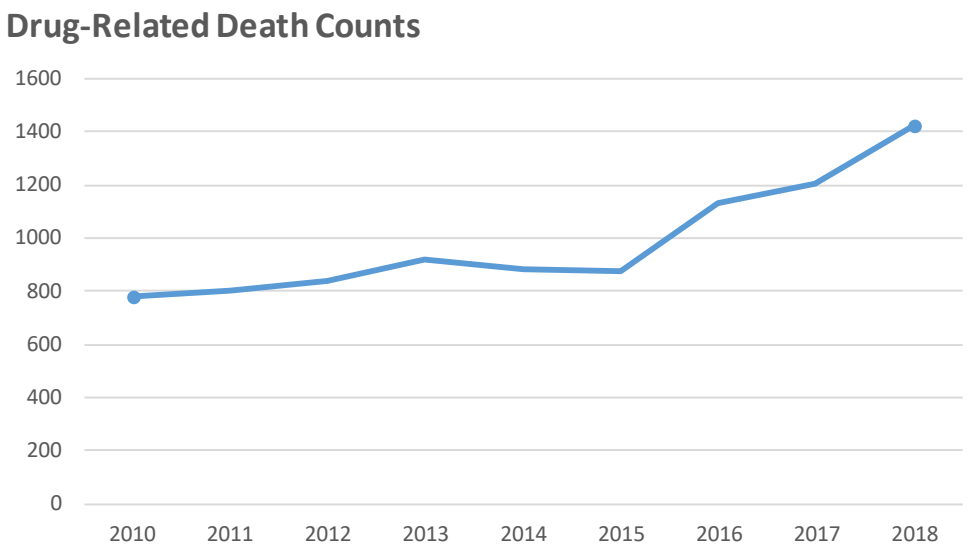


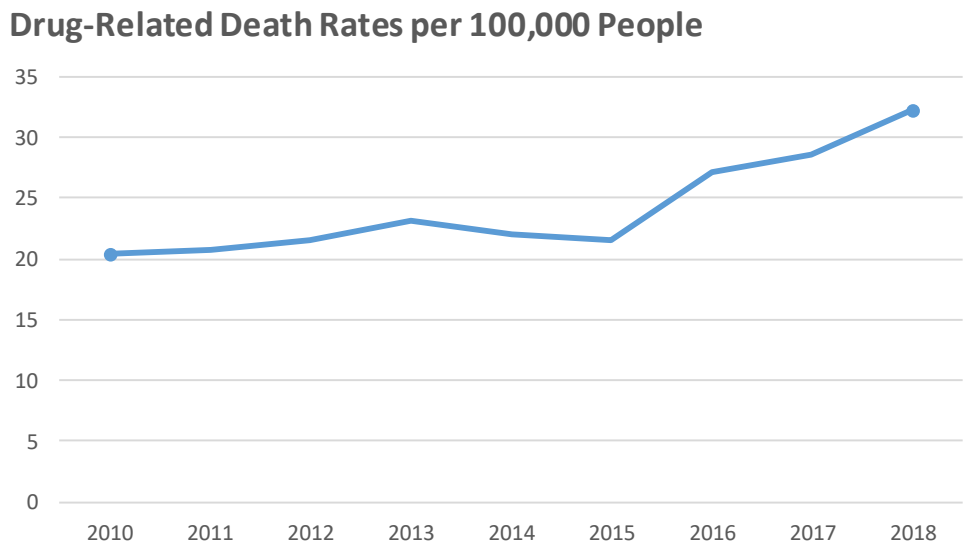


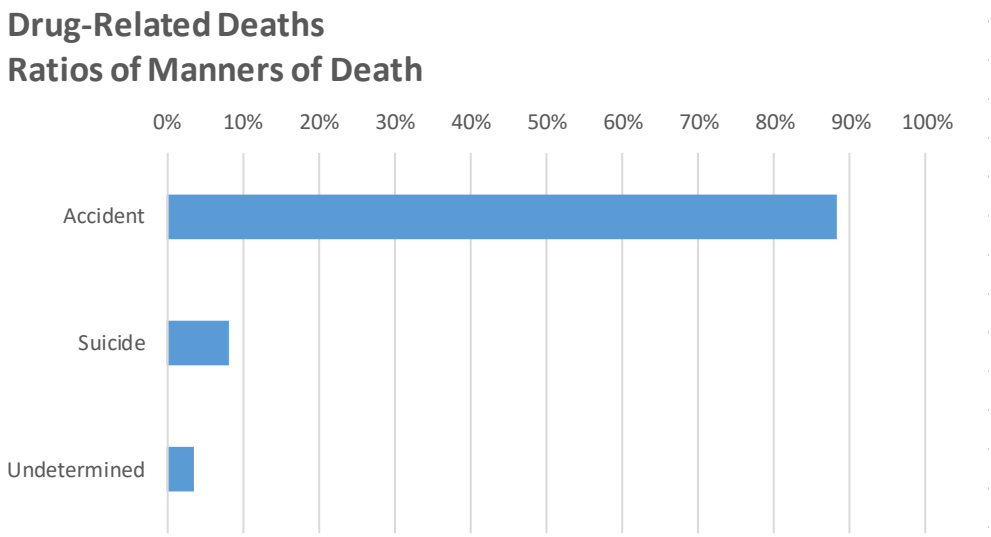
Drug Overdoses/Toxicity Deaths

Deaths are classified as drug overdose/toxicity deaths when they are caused directly by the acute effects of drugs or the acute effects of drugs directly contribute to the death; this excludes indirect effects of drugs (for example, an intoxicated driver who dies of traumatic injuries typically would not be classified as a drug toxicity death even though the intoxication indirectly contributed to the death) and chronic effects (for example, a long-term heavy user of alcohol who dies of alcoholic liver cirrhosis).

In 2018, drug-related death counts and rates continued to rise. The vast majority were unintentional.

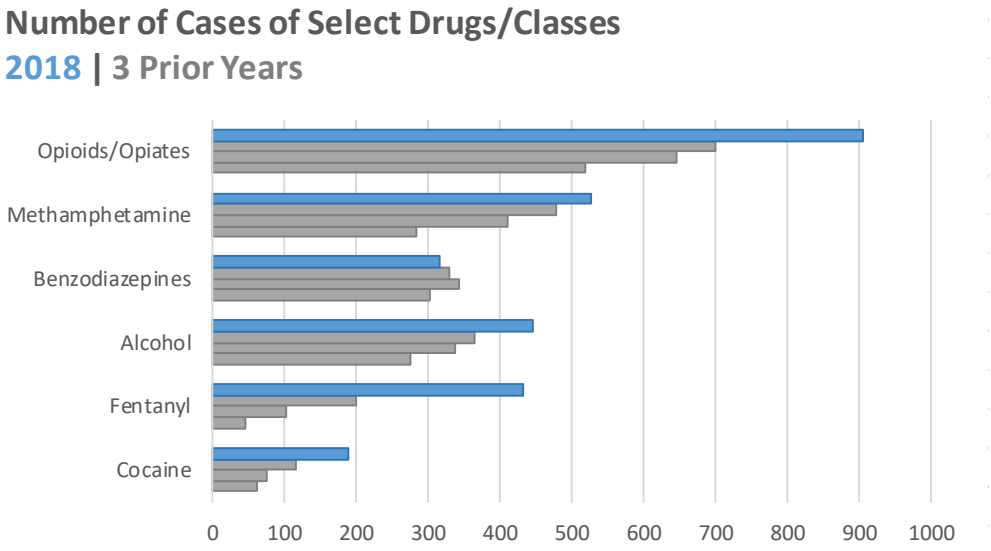




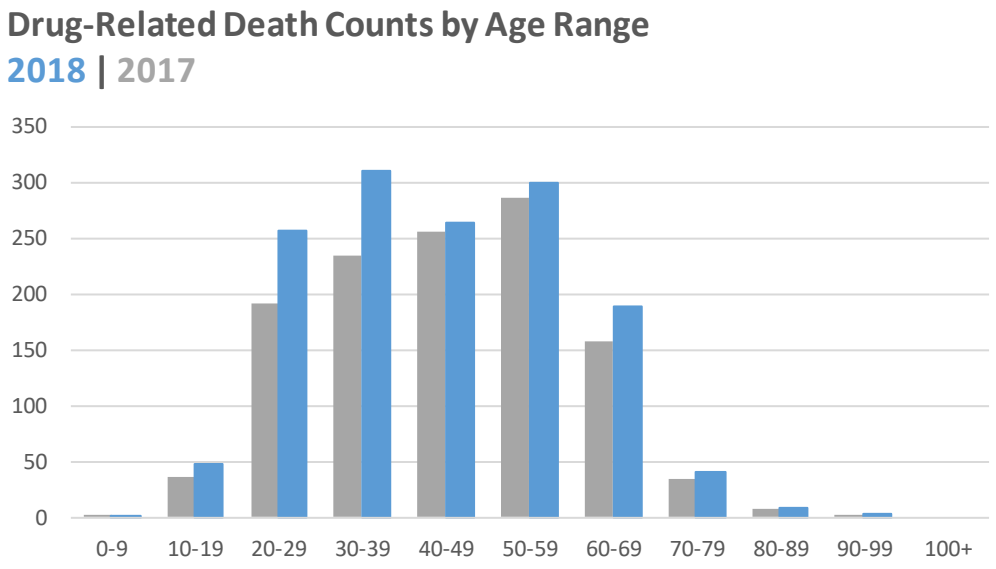


In most cases, deaths involved multiple drugs simultaneously. Below are case counts of major drug classes or specific drugs that were involved in deaths in **2018** and the **3 prior years** – note: A single death may be counted in multiple drug classes if multiple drugs were involved.

The number of fentanyl cases has continued to quickly rise, doubling in number each year since 2015.



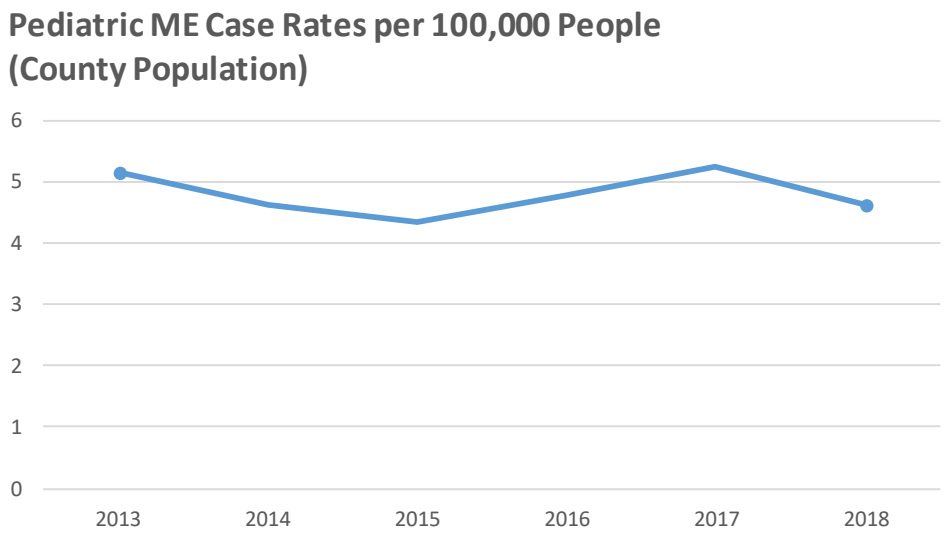
Drug-related deaths are seen across the age spectrum and most cases affect individuals 20-69 years old.

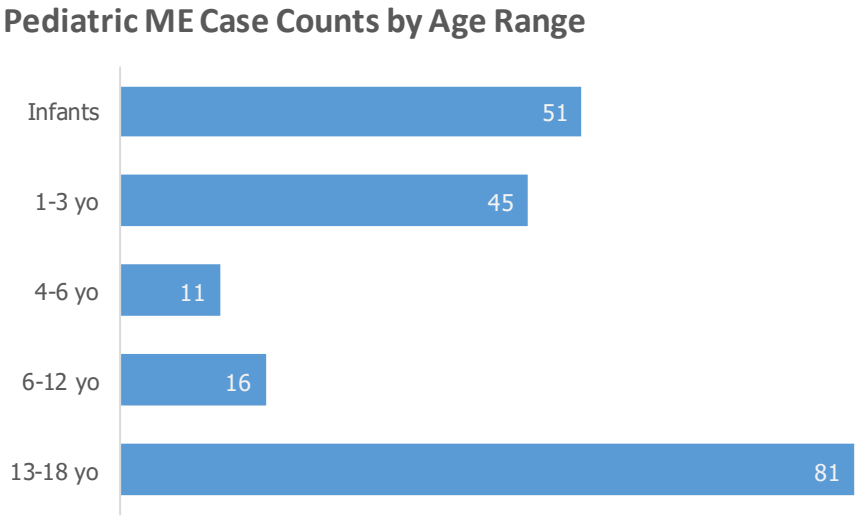


Pediatric Deaths

Deaths in childhood are uniquely tragic to our community. All pediatric deaths are reported to the Arizona Child Fatality Review Team for review, collation, and recommendations for future prevention efforts.

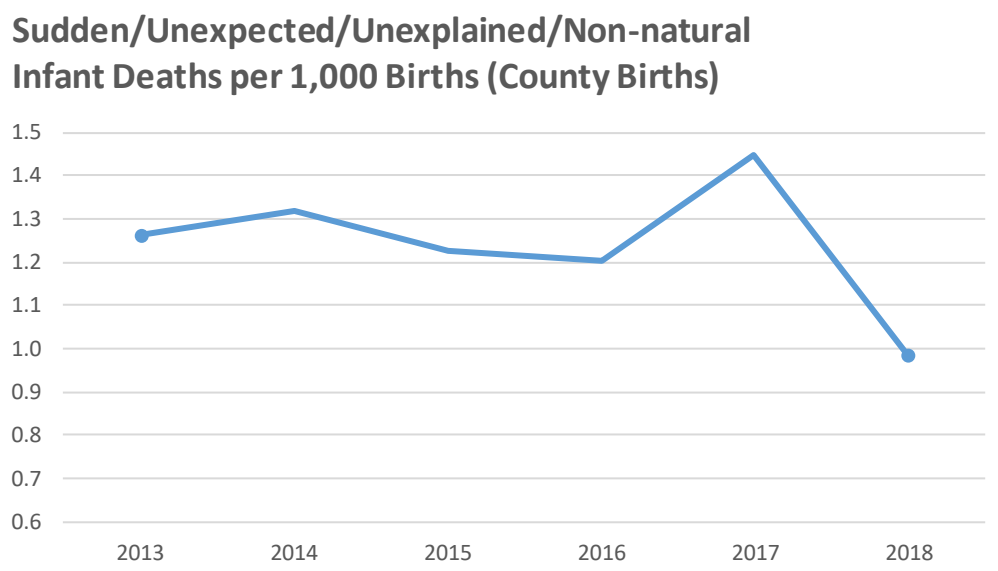
In 2018, OME investigated the deaths of 204 children (under the age of 18 years) including 51 infants (children under the age of 1 year).



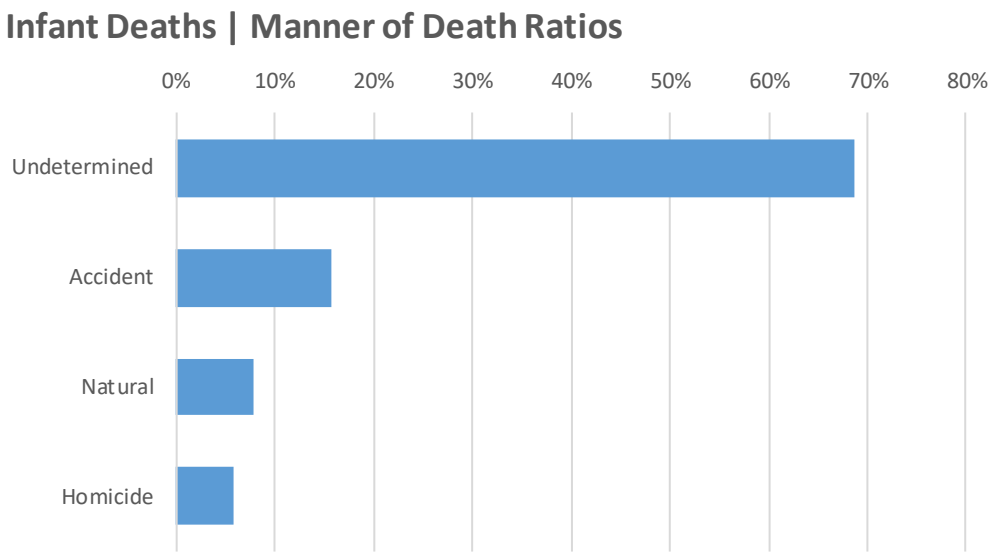


Infant Deaths:

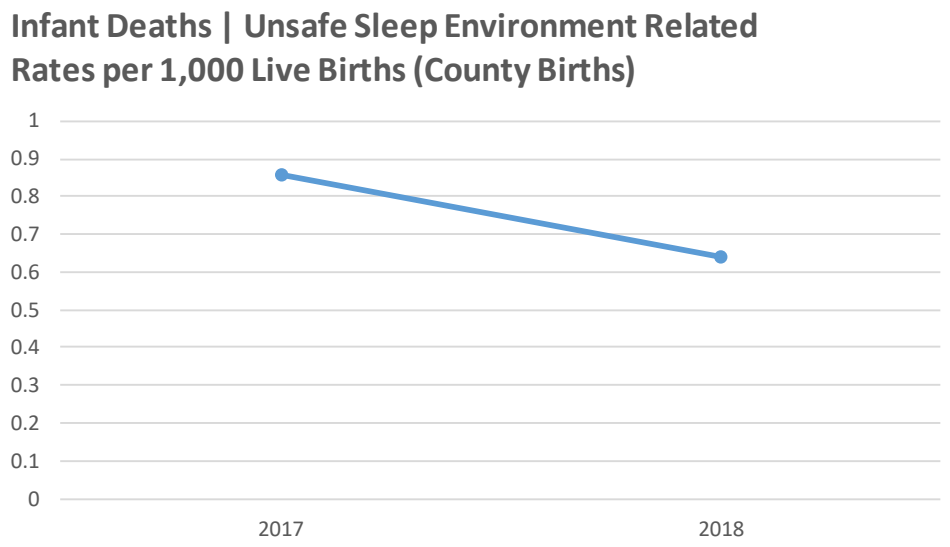
In 2018, the infant ME death rate per 1,000 county live births dropped dramatically.



In this age group, the majority of deaths were categorized with a Manner of Death of Undetermined; however, of the 35 deaths listed this way, 94% were associated with potentially unsafe sleep environments.

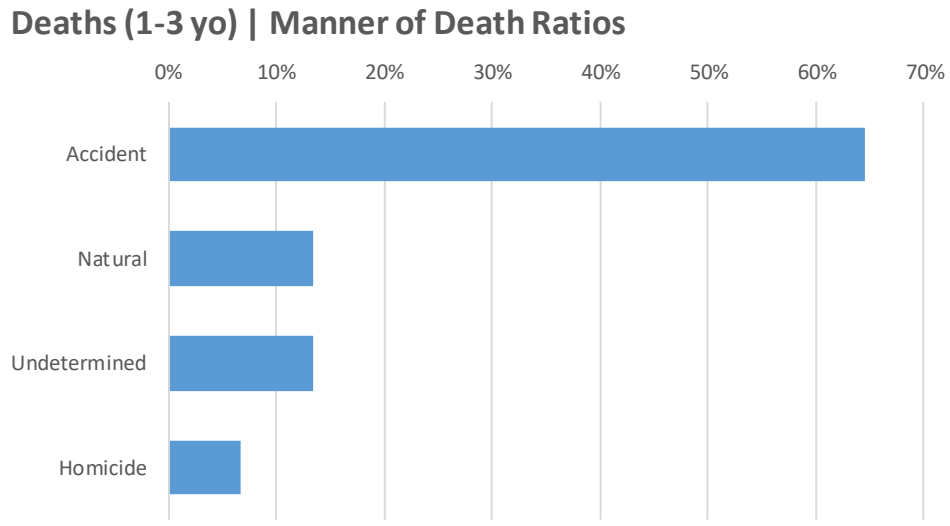


In recent years, education campaigns have sought to bring awareness to safe infant sleep routines. The rate of infant deaths caused by or associated with potentially unsafe sleep environments dropped in 2018.



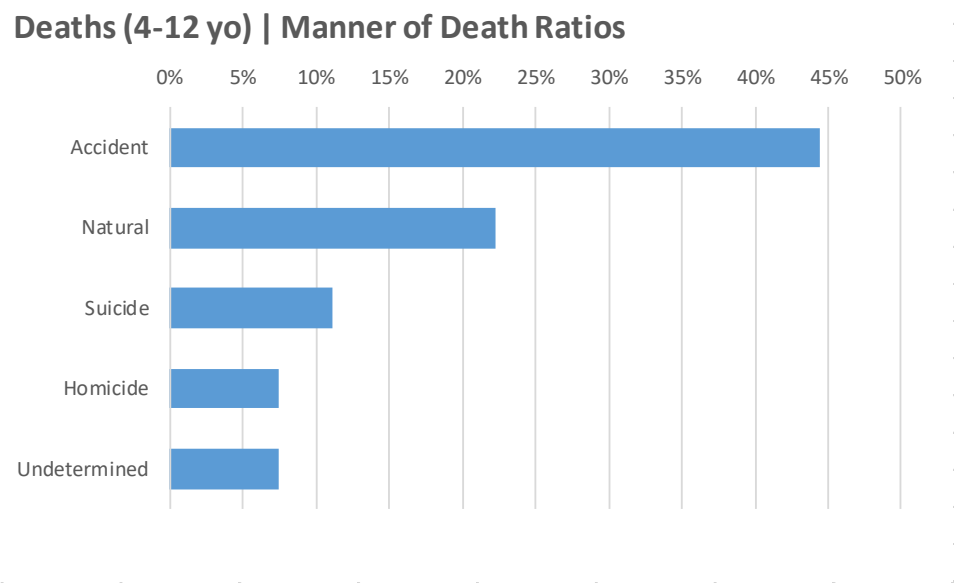
Toddler Deaths:

This age group includes children 1-3 years old. The majority of the deaths in this group were accidental and predominantly due to drowning.



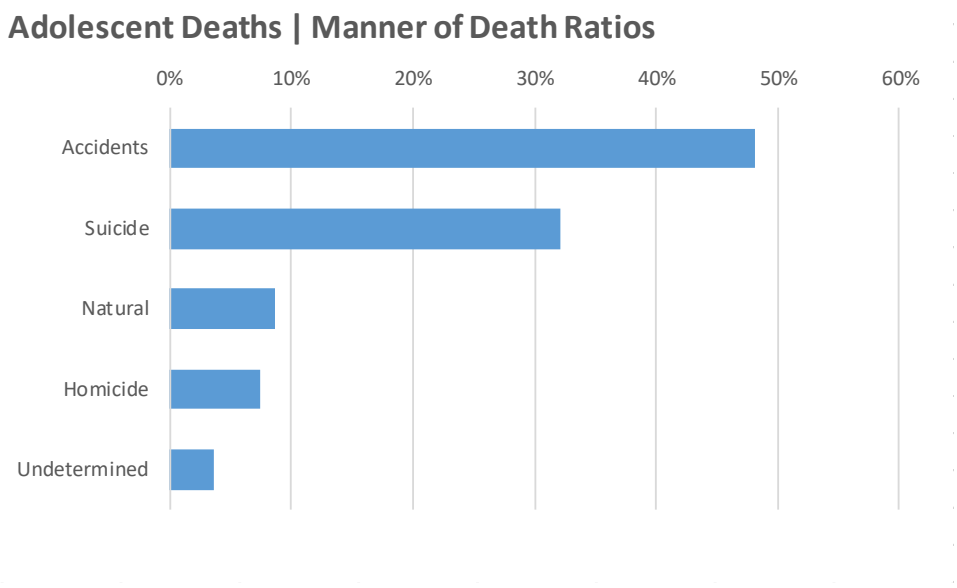
Children 4-12 Years Old:

The majority of deaths in this age group were accidental and predominantly motor vehicle related.



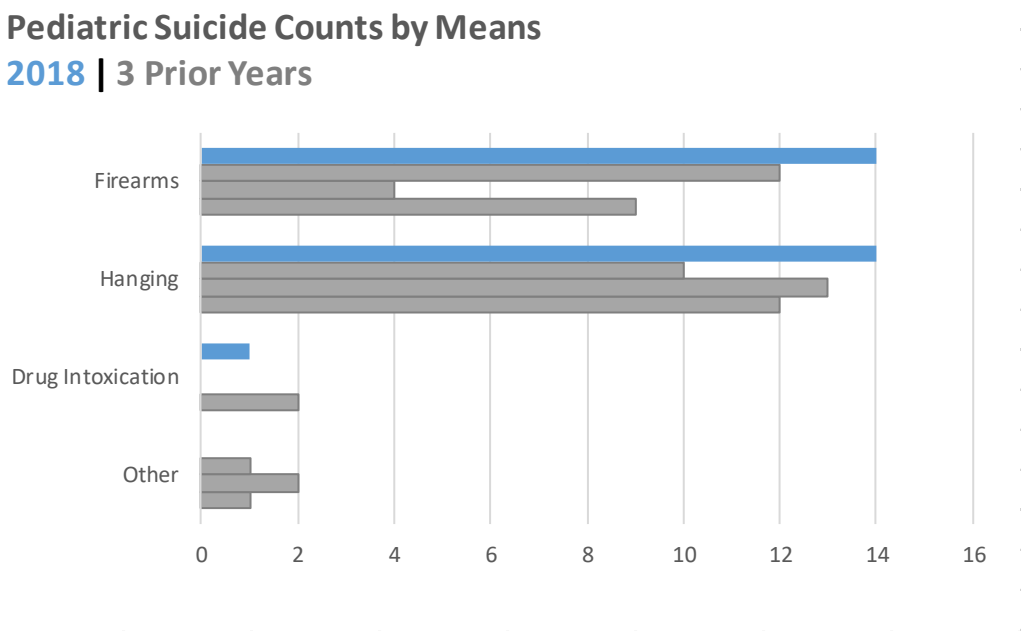
Adolescent Deaths:

This age group includes children between the ages of 13-17 years. In 2018, there were 81 deaths. The majority of deaths were accidental with 51% motor vehicle related and 38% drug related. Of the drug-related deaths all but one involved the use of fentanyl.



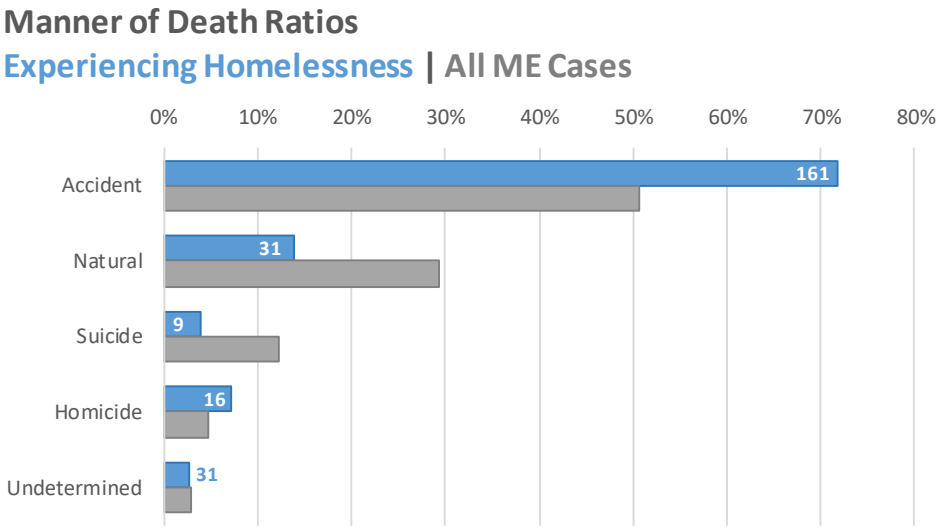
Pediatric Suicides:

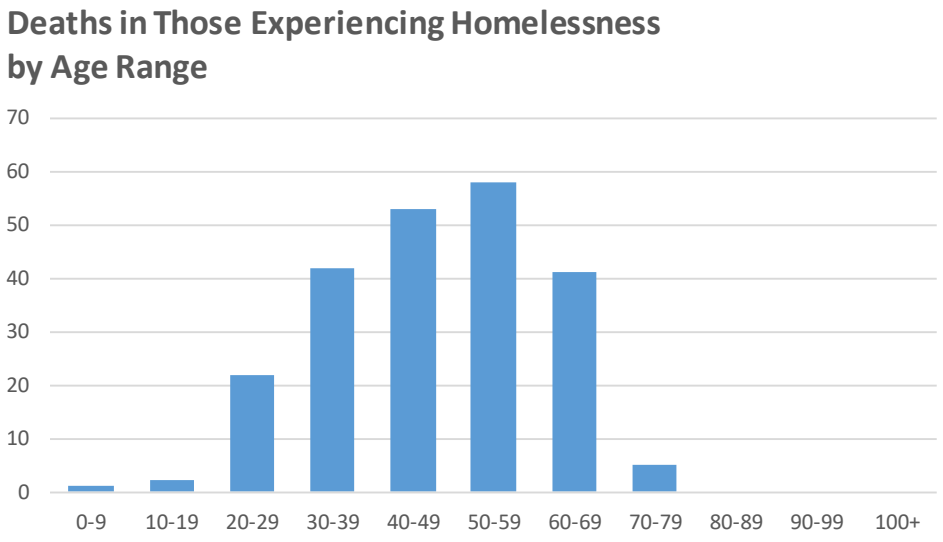
In 2018, 29 children died from suicide ages 11-17 years, 4 girls and 25 boys. The two most frequent means were use of a firearm and hanging.



Deaths in Those Experiencing Homelessness

Individuals in our community experiencing homeless may be more vulnerable to particular types of death. In 2018, ME cases included 224 individuals who were noted to be experiencing homelessness. The ratios of accidental and homicidal death were higher in this population than in the overall population of ME cases.





MARICOPA
1871
ARIZONA
COUNTY