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2021 Executive Summary

In this seventh annual report, we again summarize the trends for deaths in our community that were non-natural or natural but initially unexplained. Caseloads continued to grow at rates exceeding population growth in Maricopa County. Rates for accidents, natural-death Medical Examiner (ME) cases, suicides, and homicides all grew in 2021.

As has been the trend since 2017, drug-related deaths comprised the largest subcategory of deaths investigated, now making up 28% of the total jurisdictional caseload. In encouraging news, the rate of drug-related deaths was nearly flat compared to the prior year, something not seen in the last six years with the dramatic rise in these deaths. Much work is being done to address the crisis and we hope that future reports will begin to show decreases in the drug-related death rate. Fentanyl and methamphetamine are still the most prevalent drugs involved by far.

Traffic-related deaths, including those who die in motor vehicle crashes and pedestrians or cyclists struck and killed by motor vehicles, began to increase in mid-2020, a counterintuitive trend since less vehicles were on the road. Unfortunately, the trend continued unabated in 2021 and traffic fatalities made up the bulk of the annual increase in accidental deaths in the county.

The Office of the Medical Examiner (OME) continued to conduct investigations into deaths outside the healthcare setting that were suspicious for being caused by or contributed to by infection with the Severe Acute Respiratory Syndrome Coronavirus-2 first identified in humans in late 2019 (SARS-CoV-2 or COVID-19). Monthly counts again matched surges in COVID-19 cases in the community, adding 445 additional deaths in 2021 that would not have been accounted for without OME involvement.

OME continued to participate in state-level fatality review teams for child fatalities and drug-related fatalities and in education programs for medical students, physician assistants, dental students, anthropology students, and court officials.

It is important to recognize that each statistic in this report represents the loss of a human life, leaving bereaved family and friends behind. We hope, as always, that understanding the trends in our community can assist policy makers, public health officials, and the systems of healthcare and public safety as they work to improve our lives.

Accreditation

The Office of the Medical Examiner (OME) underwent on-site inspection in 2021 and not only maintained its full accreditation by the National Association of Medical Examiners (NAME), but was described as “…a model for a large office in an urban setting…” The accreditation program ensures facilities, policies, procedures, staffing, and turn-around-times are meeting industry standards for excellent medicolegal death investigations.
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 the public’s best 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 subspecialty 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. Once all investigation is complete, including follow-up and records reviews, a Medical Examiner Report is authored that details the observations and findings and summarizes the medical facts and conclusions.

In cases requiring investigation, OME is also responsible for certifying the medical 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, OME may list them as “pending” and amend the Death Certificate once additional investigation has been concluded.

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. We share data with partners in the Public Health System so patterns can be identified and interventions can be implemented. We 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 incredibly challenging and we are grateful for the dedicated public servants 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:

**Administration and Administration Support** – Provide business support, reception, scheduling, records management, transcription services (in-house and external), and data entry and validation for electronic Death Certificates. Includes a social worker who serves as a Family Advocate to assist bereaved family members who interact with OME.

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

**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. Includes special teams trained in advanced fingerprinting and photography.

**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.

**Laboratory** – In-house histology for preparation of microscopic slides and evidence technicians who provide specimen handling in collaboration with outside labs for toxicology, microbiology, serology, and other special testing.

**Medical Examiner** – Forensic Pathologists (FPs; physician staff trained and Board Certified in the medical subspecialty of forensic pathology) and Physician Assistants (PAs). They make jurisdictional case decisions, conduct postmortem examinations, certify deaths, review records and results, formulate medical conclusions and author OME’s final work-product, the Medical Examiner Report. This section also includes a Forensic Anthropologist and a Forensic Odontologist, both Board Certified, providing forensic specialist expertise in identifications, remains recovery, and trauma assessment.

**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.
Jurisdiction of the Medical Examiner

Not all deaths that occur in Maricopa County require reporting to or investigation by the Medical Examiner. The vast 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 medical 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 Occurring in Maricopa County

Typically, deaths occurring in Maricopa County grow at a similar rate as population growth\(^1\) (just below 2%). In 2021, there were 48,874 deaths, an 8% increase from the prior year. Like in 2020, peak months for this excess mortality aligned with surges in COVID-19 cases.

\(^1\) County population from [https://worldpopulationreview.com/us-counties/az/maricopa-county-population](https://worldpopulationreview.com/us-counties/az/maricopa-county-population)
Deaths Reported and Jurisdictional Dispositions

When a death is reported, a 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 Forensic Pathologists review the declined cases daily to ensure agreement with the decision.

In 2021, **14,022** deaths were reported to OME (29% of all county deaths), a 4% increase from 2020. Of these, **7,784** (56% of reported) met statutory jurisdictional criteria and were accepted as jurisdictional cases, an 8% increase from the prior year. For the remaining **6,238** deaths, jurisdiction was declined and the Death Certificate was medically certified by one of the individual’s healthcare providers.
Cremation Authorizations

In cases where the deceased or their family selects cremation for final disposition of the remains, Arizona statute requires the Death Certificate to 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, an on-call Forensic Pathologist 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 2021, OME authorized 37,962 cremation requests representing 78% of all county deaths. This system provides a safety net by having Forensic Pathologist Medical Examiners review the vast majority of death certificates and ensure they are not missed medical examiner cases.
Scene Evaluations

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 also critical to determining the underlying cause of the death or in answering anticipated questions.

In 2021, MDIs responded to 4,131 incident and/or death scenes for evaluation, an 8% increase from the prior year. Ninety-eight percent (98%) of responses were within 2 hours and the average time to respond was 48 minutes.

Scenes Evaluated

Scene Response within 2 Hours
Average Time (Minutes) to Respond to Scenes


48
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 Forensic Pathologist work together to verify the identity of the remains.

In 2021, 952 cases were admitted as unidentified and 936 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, 281 remains, including some 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 events to attempt to gather leads.

Cases Admitted as Unidentified | Cases Identified

![Graph showing cases admitted as unidentified and cases identified from 2013 to 2021.](image-url)
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 subspecialty trained in forensic pathology. 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, a Medical Examiner Physician Assistant will formulate conclusions based on a review of the records; these are designated Cases Not Admitted (CNAs).

In 2021, 6,021 bodies were admitted for postmortem examination and 1,760 cases were concluded through only record review (CNAs). Admissions grew by 9% from the prior year and CNAs by 7%.
The types of postmortem examination, trends, and ratios are summarized below.\(^2\)

### Examination Types

<table>
<thead>
<tr>
<th>Year</th>
<th>Autopsies</th>
<th>Autopsies + Partial Autopsies</th>
<th>External Examinations</th>
<th>Partial Autopsies</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
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<td>2011</td>
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<td>2020</td>
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<tr>
<td>2021</td>
<td></td>
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</tr>
</tbody>
</table>

### Ratios: Autopsy, Partial Autopsy, External Exams

\(^2\) 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, OME 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 2021, 91% of cases undergoing postmortem examination had specimens submitted for toxicology testing. On average, testing was completed in 20 days from the date of examination with 92% complete within 30 days.
Medical Examiner Reports

The final work product of an investigation is the Medical Examiner (ME) Report. These reports are authored by the Forensic Pathologists or Physician Assistants to document their observations, a summary of the investigation, the findings, and their medical conclusions. Timeliness is important to families and stakeholders, so accreditation standards require that 90% of reports be completed within 90 calendar days from the examination date. In 2021, agencies were again exempted from this standard due to the workload effects of the COVID-19 pandemic.

In 2021, thanks to workforce shortage mitigation strategies introduced in 2020, 96% of ME Reports were completed within 90 days and an average of 52 days. Additionally, 99.5% of reports were completed within 6 months and all but 4 cases were completed within 1 year. Sixty-six percent (66%) of reports were completed within 60 days, the highest percentage since 2011.

![Percentage of ME Reports completed within 90 days](image)

![Average ME Report completion time (days)](image)
Organ/Tissue Donation

In medical examiner cases where the deceased or their 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 2021, 171 medical examiner cases had organs procured for donation and 426 had tissues procured, such as corneas and heart valves. These donations provided 483 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’s Department of Public Health and Public Fiduciary.

In response to the economic impacts of the COVID-19 pandemic, Maricopa County also established a Funeral Assistance Program to aid families.

Number Unclaimed

Typically, 5-6% of admissions each year go unclaimed
Manners of Death

In the final step of the medicolegal death investigation, a Medical Examiner Report is authored that includes detailed descriptions of observations, a summary of the medical facts, the medical findings, and conclusions. 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 public health 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 medical vital statistical classification to group certain circumstances of death. The choices for Manner of Death are Accident, Natural, Suicide, Homicide, 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.

Each death certified at OME will also include a SubManner category; this represents the single most significant subcategory in the certifier’s medical opinion, even if the death is multifactorial.

### 2021 Manner of Death Ratios and Counts

<table>
<thead>
<tr>
<th></th>
<th>Counts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accident</td>
<td>4,205</td>
</tr>
<tr>
<td>Natural</td>
<td>2,199</td>
</tr>
<tr>
<td>Suicide</td>
<td>766</td>
</tr>
<tr>
<td>Homicide</td>
<td>376</td>
</tr>
<tr>
<td>Undetermined</td>
<td>212</td>
</tr>
</tbody>
</table>
Manner of Death rates as a ratio of the number of deaths for each category relative to the population of Maricopa County each year allow comparisons to other jurisdictions and account for population changes. In 2021, the accident rate rose 7% due largely to increased traffic fatalities, the natural death ME case rate rose 7% and showed monthly peaks that aligned with COVID-19 surges, the homicide rate increased 2%, and the suicide rate increased 6% after hitting its lowest rate since 2010 in 2020.
Manner of death count and ratio trends are below. The ratio is the proportion of ME cases made up by each manner category. The age distribution for all ME cases shows deaths at all ages.
Manner of Death Ratio Trends

- Accident
- Natural
- Suicide
- Homicide
- Undetermined

Age Distribution

Age (years)
Manner of Death: Accident

Rates for several Accident SubManners grew in 2021: vehicle crashes (34%), pedestrian/bicyclists (28%), drowning (13%), falls (6%), and heat/cold (3%). On a positive note, the drug-related accident rate was nearly flat, growing 0.7%.
Traffic Accidents (vehicle crashes plus pedestrians or cyclists struck) continued to increase in 2021, making up 55% of the increase in accident deaths between 2020 and 2021. The trend was also seen nationally with 2021 having the most traffic fatalities in 16 years.

Monthly Accident Drug SubManner cases did not appear to align with COVID surges in 2021.
Accidents involved all ages. Drug-, fall-, and traffic-related accident age distributions are highlighted below.
Manner of Death: Natural

The vast majority of Natural deaths occurring each year are certified by community health care providers (95% of county Natural deaths in 2021) and are not required to be reported to the Medical Examiner; in 2021, this included the vast majority of deaths caused or contributed to by COVID-19. OME can only accept Natural deaths if they are outside of the care of a healthcare provider, are sudden/unexplained in previously healthy individuals, are deaths in custody, or are in unidentified decedents.

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 2021, there were 2,199 cases.

The Maricopa County Department of Public Health and Arizona Department of Health Services track health statistics that include data from 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

### Natural Death ME Case SubManners

<table>
<thead>
<tr>
<th>Cause</th>
<th>Cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cardiovascular</td>
<td>988</td>
</tr>
<tr>
<td>COVID-19</td>
<td>306</td>
</tr>
<tr>
<td>Chronic Substance Use</td>
<td>289</td>
</tr>
<tr>
<td>Respiratory</td>
<td>174</td>
</tr>
<tr>
<td>Central Nervous System</td>
<td>72</td>
</tr>
<tr>
<td>Cancer</td>
<td>72</td>
</tr>
<tr>
<td>Diabetes</td>
<td>53</td>
</tr>
<tr>
<td>Other</td>
<td>245</td>
</tr>
</tbody>
</table>
In 2021, Natural death ME cases again saw a monthly pattern that aligned with COVID-19 death surges seen in January and from August through December.
Manner of Death: Suicide

In 2021, Suicide rates increased by use of firearms (+4%), hanging (+4%), and drugs (+11%).

The majority of deaths continued to be carried out with a firearm (59%).
Suicides involved a wide spectrum of ages. Firearm and Hanging SubManners are highlighted below and show firearm use affecting all ages while hanging trended towards younger aged individuals.
Manner of Death: Homicide

There were 376 homicides in 2021 equating to a 2% increase in the homicide rate compared to 2020. Seventy-seven percent (77%) were perpetrated using firearms, a 9% rate increase from the year prior.
Monthly homicide counts showed no discernible pattern.

Homicide Case Counts

Homicides affected a wide age spectrum.
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 (for example, 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 2021, there were 212 deaths certified with an Undetermined Manner of Death with a rate increase of 15%. The most represented age group was infants (less than 1 year of age) (29 cases).
Drug-Related Deaths

Deaths are classified as drug-related when the acute effects of an intoxication cause or contribute to the abnormal physiology that leads to death; this excludes indirect consequences of drug intoxication (for example, an intoxicated driver who dies of traumatic injuries typically would not be classified as a drug toxicity death even though the intoxication may have caused the crash) and chronic (long-term) effects (for example, a long-term heavy user of alcohol who dies of alcoholic liver cirrhosis).

In 2021, the drug-related death rates rose 1.1% to 46.7 per 100,000 people and counts rose 2.9%. The vast majority (93%) were unintentional.
In many cases, deaths involved multiple drugs simultaneously. Below are case counts of specific drugs that were involved in deaths in 2021, 2020, and the 5 prior years. Fentanyl and methamphetamine are by far the two most common drugs involved with fentanyl involvement in 60% and methamphetamine involvement in 55% of all drug-related deaths in 2021.

Drug-related deaths did not show a monthly pattern similar to COVID case surges in 2021.

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3 Note: A single death may be counted multiple times if multiple drugs were involved which is common.
Drug-related deaths are seen across the age spectrum, predominately from 20-70 years old. Fentanyl and methamphetamine age distributions are highlighted below; fentanyl deaths tend to be in a younger population cohort than methamphetamine.
Pediatric Deaths

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

In 2021, OME investigated the deaths of 253 children (people under the age of 18 years) including 64 infants (children under the age of 1 year). The pediatric ME Case counts rose 7% compared to 2020. Details are in subsections below for each age range.
Manner of death count and ratio trends are below. The ratio is the proportion of Pediatric ME cases made up by each manner category. Ratios are lower than the overall ME case cohort for Natural Deaths; higher for Undetermined and Homicide deaths; and similar for Accident and Suicide deaths.
Infant Deaths:

In 2021, the infant (children under 1 year old) ME case rate per 1,000 county live births increased 10%.

In this age group, 45% of deaths were categorized with a Manner of Death of Undetermined; of the 29 deaths listed this way, 76% were associated with unsafe sleep environments. Accidental deaths were due to unsafe sleep practices (58%), drug exposures (21%), and motor vehicle crashes (13%). There was 1 drowning and 1 environmental heat exposure death (left in a hot car).
Annual Manner of Death trends for this age group are below. Improvements in investigations of sleep environments has led to a lower proportion of undetermined deaths.

In 2021, 56% of infant deaths were associated with 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 unsafe sleep environments in 2021 increased by 18% from the prior year, but was 22% lower than the five-year peak in 2019.
Toddler Deaths:
This age group includes children 1-3 years old. The majority of the deaths in this group were accidental. The most common Accidental SubManner was drowning (69%). The remainder of accidents were related to traffic accidents, fire, drug-exposure, heat-exposure, and asphyxia.
Children 4-12 Years Old:

The largest category of death in this age group was **accident** and those deaths were due to **traffic accidents** (42%), **drowning** (38%), fires, firearm discharge, and asphyxia.

![Children 4-12yo Manner of Death Ratios and Counts](image)

![ME Case Counts: Children (4-12yo)](image)
Adolescent Deaths:

This age group includes children between the ages of 13-17 years. In 2021, there were 113 deaths accounting for 45% of all pediatric ME cases. Most deaths were accidental and caused by traffic accidents (51%), drugs/alcohol (39%), drowning (10%), fire, and a firearm discharge. In the traffic fatalities, the decedent was a passenger (58%), the driver (31%), or a pedestrian struck (8%). The number of drug-related accidents in this age group decreased 44% from 2020. All the drug-related fatalities involved fentanyl and in two cases also methamphetamine. Homicides and suicides were tied as the second largest category; 92% of homicides and 35% of suicides were committed using a firearm.
Pediatric Suicides:

In 2021, 27 children died from suicide, ages 12-17 years, 16 boys and 11 girls. The two most frequent means were hanging (48%) and use of a firearm (33%).
Deaths in Those Experiencing Homelessness

Individuals in our community experiencing homelessness may be more vulnerable to particular types of death. In 2021, ME cases included 517 individuals who were noted to be experiencing homelessness, a 13% decrease from 2020. The ratio of accidental deaths was higher in this population than in the overall population of ME cases. As for all ME cases, it is important to note that natural deaths in this population are not reported to OME if they died under the care of a healthcare provider and are not included here.

Drug-related deaths were most common and in contrast to all ME cases, methamphetamine use was more commonly involved (86%) than fentanyl (61%), though that trend may be starting to change as cases with methamphetamine decreased 21% from 2020 and cases with fentanyl increased 30%.
Heat-Related Deaths

The OME investigates all deaths where environmental heat exposure may have caused or contributed to the death. The data collected during our investigation is analyzed by Maricopa County’s Department of Public Health who produces a comprehensive annual report examining trends, demographics, and co-factors in these deaths. Their reports and important information about interventions can be found at https://www.maricopa.gov/1858/Heat-Surveillance.
COVID-19 Medical Examiner Cases

The vast majority of COVID-19 deaths are not Medical Examiner cases. By law, OME may only take jurisdiction of COVID-19 cases if the death had a non-natural contributor and/or was outside of the care of a healthcare provider. Early in the pandemic, OME collaborated with Maricopa County’s Department of Public Health to develop a COVID-19 residential death surveillance program wherein deaths that were at risk of being due to COVID-19 outside of a healthcare provider’s oversight would be made ME cases and tested for the virus.

Only cases in which COVID-19 caused or contributed to the death are counted (e.g. a car crash victim with COVID-19 would not be counted). Additionally, to ensure test supplies and capacity were prioritized for the living, ME cases were not screened universally for COVID-19 and tests were only performed when history, circumstances, or postmortem findings showed a risk for infection that may have caused or contributed to death. In 2021, 445 deaths were caused by or contributed to by COVID-19 infection for a total of 683 deaths for the pandemic so far. Again, monthly case counts aligned with COVID-19 case surges in the community.