Office of the Medical Examiner

2020 Annual Report
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2020 Executive Summary

In this sixth annual report, we again summarize the trends for deaths in our community that were non-natural or natural but initially unexplained. As with all other communities across the globe, Maricopa County felt the consequences of the pandemic caused by the Severe Acute Respiratory Syndrome Coronavirus-2 first identified in humans in late 2019 (SARS-CoV-2 or COVID-19). The pandemic, through direct and indirect effects that will no doubt be studied for years to come, resulted in significant excess mortality in Maricopa County. Two COVID-19 new-case-count surges, and consequent surges in hospitalizations and deaths, occurred in 2020, one over the summer and one beginning later in the year and peaking in January of 2021.  

Preliminary national data showed COVID-19 as the third leading cause of death in the United States in 2020 after heart disease and cancer. During disasters, such as a pandemic, there can be mortality directly caused by the disaster and mortality by indirect means. Determining the causal relationships of indirect effects is complex and difficult and will likely take years of study to understand.

In Arizona, County Medical Examiners are charged by law with performing comprehensive medical death investigations in cases where the death appears to be non-natural; natural but unexplained; or natural and

1 COVID-19 Case and Death Epidemiology Curves from Maricopa County Department of Public Health at https://phdata.maricopa.gov/Dashboard/e10a16d8-921f-4aac-b921-26d95e638a45?e=false&vo=viewonly on 3/1/2021. LTCF (Long Term Care Facility)
2 Per Centers of Disease Control and Prevention: https://www.cdc.gov/mmwr/volumes/70/wr/mm7014e1.htm
outside the recent care of a healthcare professional. Because the vast majority of COVID-19 caused deaths are natural and occur under the care of a healthcare provider, they do not meet criteria for Medical Examiner (ME) jurisdiction; however, deaths outside of the healthcare system that are suspected to be caused by a disease that threatens the public’s health do and counts are summarized within this report in a new section.

Because of the seasonality of COVID-19 surges and the possibility of indirect excess mortality related to surges, monthly counts of various ME case types were examined this year and graphs added to this report in instances where there appeared to be patterns.

As noted in last year’s annual report, the Office of the Medical Examiner (OME) implemented an upgraded case management system in late 2019. The data presented here for 2020 benefits from the enhancements in that system including more robust ability to examine counts of cases by relevant dates. In this year’s report, all the Manner of Death and special topic counts (e.g. pediatrics and deaths in those experiencing homelessness) are based on date of death. Counts for caseloads (e.g. reported deaths, inquiries, and accepted jurisdiction counts) are based on the date the death was reported to OME. An additional tool you will see throughout this report is the use of SubManner of Death. This allows us to subcategorize the deaths under each Manner.

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) maintained its full accreditation by the National Association of Medical Examiners (NAME) in 2020. This 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. 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.

**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 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.

**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. In 2020, there were **45,303 deaths** compared to 35,854 the year prior, equating to a **26% increase in the death rate**. Peak months for this excess mortality aligned with surges in COVID-19 cases.

**Death rate per 100,000 people**

26% increase in deaths with an estimated population increase of 1.9% in 2020

**Maricopa County Deaths**

2018 | 2019 | **2020**

Over 45,000 deaths in 2020 compared to ~36,000 in 2019
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 2020, 13,437 deaths were reported to OME (30% of all county deaths). Of these, 7,179 (53% of reported) met statutory jurisdictional criteria and were accepted as jurisdictional cases, a 14% increase from the prior year (typical caseload annual growth is around 3%). In the remaining 6,258 deaths, jurisdiction was declined and the Death Certificate was medically certified by one of the individual's healthcare providers.
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 2020, MDIs responded to 3,820 incident and/or death scenes for evaluation. Ninety-eight percent (98%) of responses were within 2 hours and the average time to respond was 48 minutes.
Average Time (Minutes) to Respond to Scenes

- 2015: 32 minutes
- 2016: 33 minutes
- 2017: 35 minutes
- 2018: 35 minutes
- 2019: 37 minutes
- 2020: 45 minutes
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 2020, 856 cases were admitted as unidentified and 844 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, 273 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. Also in 2020, a Rapid DNA-ID instrument was procured to assist in confirming IDs in cases where other avenues have failed.
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 2020, 5,530 bodies were admitted for postmortem examination and 1,651 cases were concluded through only record review (CNAs). Admissions grew by 10% from the prior year and CNAs by 33%.
The types of postmortem examination, trends, and ratios are summarized below:\(^3\).

### 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>2019</td>
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<tr>
<td>2020</td>
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</tbody>
</table>

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

3 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 2020, 93% of cases undergoing postmortem examination had specimens submitted for toxicology testing. On average, testing was completed in 16 days from the date of examination with 97% 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 \textbf{90\% of reports be completed within 90 calendar days} from the examination date. In 2020, agencies were exempted from this standard due to the expected effects of the COVID-19 pandemic.

In 2020, though the caseload grew to a similar degree as seen in 2016 with the beginning of the opioid crisis, \textbf{89\% of ME Reports were completed within 90 days} and an average of \textbf{67 days}. These results were made possible by the mitigating effects of two new fourth-quarter programs: Locum Tenens Forensic Pathologist assistance with admissions cases and Medical Examiner Physician Assistants completing CNA cases.
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 2020, 147 medical examiner cases had organs procured for donation and 471 had tissues procured, such as corneas and heart valves. These donations provided 513 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.
Cremation Authorizations

In cases where the deceased or her/his 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 2020, OME authorized **34,852** cremation requests representing **77%** 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.
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 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.

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.

![2020 Manner of Death Ratios and Counts](image)
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 2020, the accident rate rose 17% due largely to continued effects of the opioid crisis, the natural death ME case rate rose 15% and showed monthly peaks that aligned with COVID-19 surges, and the homicide rate increased 25%. The suicide rate declined 3%.
Manner of death count and ratio trends are below. The ratio is the proportion of ME cases made up by each manner category.
Manner of Death: Accident

Rates for several Accident SubManners grew in 2020: heat/cold (62%), drugs (45%), drowning (43%), vehicle crashes (12%), and pedestrian/bicyclists (2%). Falls declined (3%).
Accident Drug SubManner cases showed an atypical monthly case distribution with a peak from May through August but no increase toward the end of the year.

Accident Drug SubManner Counts

2019 | 2020

Accident vehicle crash cases trended upwards during the second half of 2020. Increased traffic fatality rates by vehicle miles travelled were seen nationally as well.

Accident Vehicle Crash SubManner Counts

2019 | 2020
Accidents involved a wide spectrum of ages. Drug and fall-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 2020) and are not required to be reported to the Medical Examiner; in 2020, 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 2020, there were 2,011 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>Category</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cardiovascular</td>
<td>1,114</td>
</tr>
<tr>
<td>Respiratory System</td>
<td>202</td>
</tr>
<tr>
<td>Chronic Substance Use</td>
<td>197</td>
</tr>
<tr>
<td>COVID-19</td>
<td>128</td>
</tr>
<tr>
<td>Central Nervous System</td>
<td>81</td>
</tr>
<tr>
<td>Cancer</td>
<td>61</td>
</tr>
<tr>
<td>Diabetes</td>
<td>56</td>
</tr>
<tr>
<td>Other</td>
<td>172</td>
</tr>
</tbody>
</table>
In 2020, Natural death ME cases saw an atypical monthly pattern not seen in prior years; this pattern aligns with COVID-19 death surges seen in the summer and from December 2020 into 2021.
Manner of Death: Suicide

In 2020, Suicide Manner of Death cases saw a rate decline. For Suicide SubManners, the firearm rate increased while hanging decreased.

The majority of deaths continued to be carried out with a firearm.
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 363 homicides in 2020 equating to a 25% increase in the homicide rate. Seventy-two percent (72%) were perpetrated using firearms, a 23% rate increase from the year prior.
Monthly homicide counts are shown below compared to the year prior.

Homicide Case Counts

<table>
<thead>
<tr>
<th>2019</th>
<th>2020</th>
</tr>
</thead>
</table>

Homicides affected a wide age spectrum.

Homicides: Age Distribution
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 2020, there were 181 deaths certified with an Undetermined Manner of Death with a rate decrease of 2%. The most represented age group was 0-2 year olds (32 cases). Infants (children under 1 year of age) were most commonly represented.
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 2020, the drug-related death rates rose 32% to 46.2 per 100,000 people and counts rose 35% (2,110). The vast majority (94%) were unintentional.
In many cases, deaths involved multiple drugs simultaneously. Below are case counts of specific drugs that were involved in deaths in 2020, 2019, and the 4 prior years. The number of fentanyl cases has continued to double annually most years since 2015 (4,300% increase in cases since 2015), quickly becoming the most common drug detected in overdoses (1,145 cases in 2020).

Drug-related deaths showed a larger summer peak in 2020 than in the prior year but no winter surge.

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4 New methods afforded by OME’s new database system allows more accurate counts than in prior years’ reports; numbers in this report are similar but may not match prior years’ reports. Note also: 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. 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 deaths are reported to the Arizona Child Fatality Review Team for review, collation, and recommendations for future prevention efforts.

In 2020, OME investigated the deaths of 237 children (people under the age of 18 years) including 57 infants (children under the age of 1 year). The pediatric ME Case rate rose 12%. Forty-six percent (46%) were in adolescent children (ages 13-17 years), a 48% count increase from the prior year.
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 2020, the infant ME case rate per 1,000 county live births decreased 17%; this was seen even as birth rates have been falling in the county since 2014.

In this age group, 46% of deaths were categorized with a Manner of Death of Undetermined; of the 25 deaths listed this way, 80% were associated with unsafe sleep environments. Accidental deaths were predominantly due to unsafe sleep practices (67%).

Infant Manner of Death Ratios and Counts

<table>
<thead>
<tr>
<th>Manner of Death</th>
<th>Ratio</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Undetermined</td>
<td></td>
<td>25</td>
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<tr>
<td>Accident</td>
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<td>15</td>
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<tr>
<td>Natural</td>
<td></td>
<td>10</td>
</tr>
<tr>
<td>Homicide</td>
<td></td>
<td>4</td>
</tr>
</tbody>
</table>
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 2020 dropped by 34% from the prior year.

**Infant Deaths | Unsafe Sleep Environment Related Rates per 1,000 Live Births (County Births)**

Toddler Deaths:
This age group includes children 1-3 years old. The majority of the deaths in this group were accidental. The three most common Accidental SubManners were drowning (60%), pedestrian/bicyclist struck by motor vehicle(s) (17%), and choking (10%). The remainder of accidents were related to drug-exposure, heat-exposure, and motor vehicle crashes.

**Toddler Manner of Death Ratios and Counts**

<table>
<thead>
<tr>
<th>Manner</th>
<th>Counts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accident</td>
<td>30</td>
</tr>
<tr>
<td>Undetermined</td>
<td>7</td>
</tr>
<tr>
<td>Homicide</td>
<td>4</td>
</tr>
<tr>
<td>Natural</td>
<td>4</td>
</tr>
</tbody>
</table>
Children 4-12 Years Old:

The largest category of death in this age group was **accident** and predominantly due to **motor vehicle crashes** (69%). The remainder of accidents involved being a pedestrian/bicyclist, drug-exposure, or heat-exposure.

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

Adolescent Deaths:

This age group includes children between the ages of 13-17 years. In 2020, there were **111** deaths. The majority of deaths were accidental with **61% drug related** and **29% motor vehicle crashes**. Of the drug-related deaths, **97% involved the use of fentanyl**. Homicides continued to be the second largest category; **74% were due to gunshot wounds**.

![Adolescents Manner of Death Ratios and Counts](chart)
Pediatric Suicides:

In 2020, 22 children died from suicide, ages 10-17 years, 18 boys and 4 girls. The two most frequent means were hanging and use of a firearm.
Deaths in Those Experiencing Homelessness

Individuals in our community experiencing homelessness may be more vulnerable to particular types of death. In 2020, ME cases included 596 individuals who were noted to be experiencing homelessness. 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 required to be reported if they died under the care of a healthcare provider.

5 OME’s new case management system allows for more accurate accounting of these deaths than in prior years which may have been undercounted by an unknown amount.
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. A total of 238 deaths were certified with a cause or contributory cause of death of COVID-19.