



2021 Annual Report

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ABOUT THE OFFICE OF THE MEDICAL EXAMINER

The Medical Examiner's Office in Allegheny County is committed to deliver high quality professional forensic investigation and laboratory services to the citizens of Allegheny County.

The staff supports the obligation to investigate sudden, unnatural, and violent deaths with compassion for families and friends during their time of grief. The Medical Examiner's Office applies current scientific methods for evidence analyses and investigations to effectively assist law enforcement, judicial court systems and health and environmental agencies.

Mission

The Allegheny County Office of the Medical Examiner will serve the citizens of Allegheny County by supporting law enforcement, the public defender's office, district attorney's office and judicial system by providing Medico-legal death investigation, forensic, clinical and environmental analysis, consultation and expert testimony. The office has the additional mission of using the knowledge obtained in this process to promote education and research into the key public health problems facing the citizens of the county such as gun violence, drug overdose, suicide and other issues.

The Medical Examiner's Office will be foremost in the delivery of these services to our client base through a continual review and update of Evidence Based Practices Standards within the office along with input from practices in other Medical Examiner systems and standards promulgated by the National Association of Medical Examiners (NAME) and ANAB / ISO (International Standards Organization).

Vision

The Medical Examiner's Office will continually strive to exceed customer expectations by being the benchmark in Medico-legal death investigation, forensic, clinical, and environmental analysis, methods development, process optimization, and sound business practices.

Values

- Respect for the dignity of all those we serve; compassion; fairness; and uncompromising personal and institutional integrity.
- We will keep customers and staff at the forefront of decisions that have direct impact on their job-related responsibilities.
- We are committed to keeping open and effective lines of communication with staff and agencies.
- We will instill a climate of motivational teamwork that fosters efficiency and innovation.
- We will cultivate an environment in which the staff works without trepidation.

THE MEDICAL EXAMINER

Dr. Karl E. Williams, MD, MPH, was appointed Medical Examiner of Allegheny County in January of 2007. Originally trained in Forensic Pathology here in Allegheny County, he had over 20 years of expertise consulting on forensic cases and laboratory management before coming to Allegheny County.

Dr. Williams graduated from the University of Pittsburgh School of Medicine in 1974. He completed his residency training in Anatomic and Clinical Pathology at Allegheny General and Shadyside Hospitals. He served as a Staff Pathologist at the Allegheny County Coroner's Office from 1983 to 1985. He is Board Certified in all three of these specialties.

From 1986 to 2006, Dr. Williams was the Director of Laboratories at the Ellwood City Hospital in Ellwood City, Pennsylvania, while working as Consulting Forensic Pathologist to several of the elected lay coroners of surrounding counties. In 2005 he earned a Master's in Occupational and Environmental Medicine from the University of Pittsburgh Graduate School of Public Health.

Dr. Williams was appointed to be the County's first Medical Examiner after a year-long search, following row office reform in 2006. Dr. Williams feels fortunate in being able to head one of the few Death Scene Investigation systems in the country which combines both Morgue and Crime Laboratories into a single integrated entity.

He has become known both locally and nationally for his and his office's efforts in combatting the current epidemic of drug overdoses. In addition to the continual attention to improving the quality of service rendered to the citizens of Allegheny County, his personal interests are in the areas of drug overdoses and child deaths.

HISTORICAL PERSPECTIVE

This office has a long history in Allegheny County and went through some substantial changes in 2005. In that year, Allegheny County voters approved a referendum that eliminated the Coroner as a Row Office, making it an appointed position, now called Medical Examiner. This position is now appointed by the County Executive to a five-year term and reports to the Allegheny County Manager.

The Office of the Coroner dates back to the Anglo-Saxon Common Law system of government, making it the oldest administrative office in Europe. The earliest mention of Coroner is in the statutes of Eyre around 925 A.D. It was an appointed position with broad judicial and investigative powers to investigate instances of death. It is the origin of the jury system.

In 1170 A.D., the King succumbed to pressure from the residents of London, giving them permission to elect four Coroners to serve the area. By 1215 A.D., the subjects throughout the kingdom demanded that they be allowed to elect Coroners. The King of England signed the petition, creating one of the most famous documents in existence, the Magna Carta.

Until recently, the Coroner had jurisdiction over crimes such as robbery, rape and burglary, in addition to homicides. As late as the early nineteenth century, the Pennsylvania Supreme Court ruled that these common law powers still inherently rested with the Coroner but were seldom exercised. It was not until 1972 that the Coroner statutes became codified and those seldom-used common law powers of the Coroner were officially abolished.

By the turn of the century, the Coroner's Office in Allegheny County was well on its way to becoming a fully developed medico-legal investigative agency. Employees took an active role in performing autopsies, rather than hiring private physicians to do the work. In 1965, Allegheny county voters elected their first physician as Coroner. Since that time, the Office has made its professional expertise available upon request to Coroners' offices and law enforcement agencies in surrounding counties.

The building that housed the Allegheny County Medical Examiner's Office has a rich history of its own. The impressive stone edifice was constructed at the

turn of the century and was occupied by the Coroner/Medical Examiner's office from 1902 until 2009. Its gothic architecture mirrors that of the Allegheny County Courthouse and former Jail. The intention of the County planners was to form a fortress-like enclave of government centered in Downtown Pittsburgh. The buildings were constructed adjacent to each other, with the Mortuary being located at Forbes Avenue and Ross Street diagonally across the intersection from the Courthouse.

By 1929, Allegheny County government needed more space for expansion. It was determined that the most efficient form of expansion was the construction of one consolidated County Office Building on Ross Street between Forbes and Fourth Avenues, forcing the relocation of the Mortuary. The County was able to procure the property at 542 Fourth Avenue where the Metropol Restaurant and the MB Speer & Company were located, and hired a young engineer named Levi Duff to supervise the move.

The three-story marble and stone monument was moved by a system of beams designed by Kress-Orvits Co. The building was slowly and laboriously moved in one piece onto the beams and then pulled by cable along the system until it rested on the new foundation which had been built at the 542 Fourth Avenue property. Horses supplied the power needed to move the building.

During the three weeks it took to move the building, operations at the Mortuary continued. Temporary gas, water, and sewage were connected and maintained on a 24-hour basis. The move was completed in August of 1929. From that time, the building has remained in much the same condition in which the movers left it on that hot summer day when they finally placed the structure into its present foundation.

Since 2009 the Medical Examiner's Office, including both Morgue and Laboratory Operations, have been located in a single, state of the art facility located in Pittsburgh's Strip District.

MORGUE OPERATION SERVICES

Forensic Investigation: Forensic investigators conduct the initial phase of the investigation of each death reported to the Medical Examiner. Most of the vital information-gathering and record-keeping functions required for death investigations are performed by these investigators. Under the supervision of a manager, the forensic investigators coordinate their findings with autopsy and laboratories throughout the entire investigative process. When the circumstances are appropriate, one or more forensic investigators conduct an on-scene investigation in cooperation with police authorities. The forensic investigator is trained in areas such as death investigations, evidence identification, post-mortem physiological changes, traumatic injuries and medicolegal documentation.

Autopsy: The autopsy examination is the principal tool for forensic pathologists to conduct medical investigations. The autopsy staff collaborates with pathologists, investigators and the laboratories to manage a complete medical case investigation. The autopsy room is an essential laboratory during any death investigation. The examination room uses the most advanced equipment required by the pathologists to establish the cause and manner of death. In addition to the standard autopsy room tables and instruments, technical support equipment includes X-rays, photographic processing and magnifying equipment, computerized surface magnification, and recording devices. The technicians also use any necessary photographic procedures and technologies during the post mortem examination to add to the case investigation.

Histology: The Histology Laboratory aids in the investigation by creating microscopic slides from tissue samples retrieved at autopsy.

MORGUE OPERATION SERVICES

ACOME is responsible for investigating the facts and circumstances concerning deaths which appear to have happened within the county, regardless of where the death may have occurred, for the purpose of determining if an autopsy should be conducted.

Reportable deaths to ACOME include circumstances such as the following:

- Sudden deaths not caused by readily recognizable disease, or wherein the cause of death cannot be properly certified by a physician
- Deaths occurring under suspicious circumstances or as a result of violence or trauma
- Any death from trauma, chemical injury, drug overdose or reaction to drugs, medication or medical treatment
- Operative and peri-operative deaths in which the death is not readily explainable
- Any death wherein the body is unidentified or unclaimed
- Deaths as due to contagious disease and constituting a public hazard (known or suspected)
- Deaths occurring in prison or a penal institution, or while in the custody of the police
- Deaths of persons whose bodies are to be cremated, buried at sea or otherwise disposed of to be thereafter unavailable for examination
- Infant deaths

MORGUE OPERATION SERVICES

Once reportable deaths are called in to ACOME, the Forensic Investigations Unit categorizes them into specific dispositions based upon the information provided. If additional information becomes available, the disposition may change before being finalized.

ACOME dispositions include:

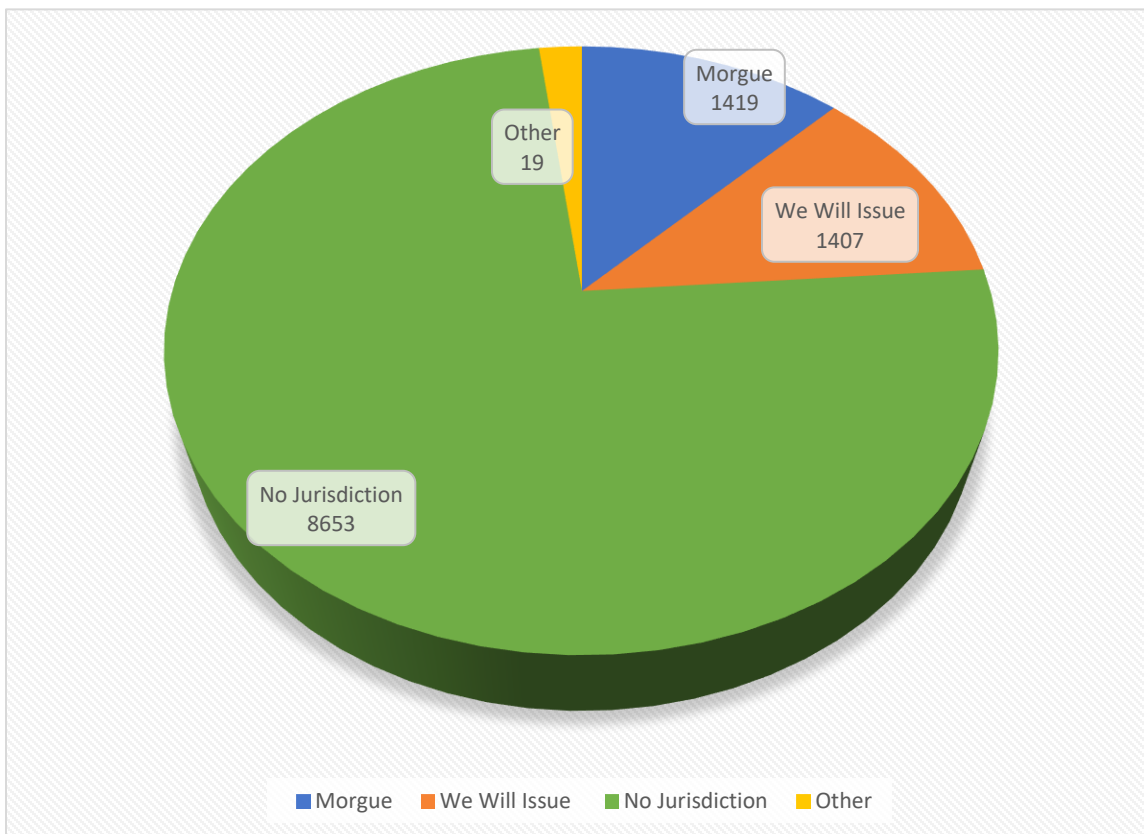
- Morgue: a pathological examination must be conducted
- No Jurisdiction: Any case where the death was imminent or reasonably expected as the result of a natural disease process, whether brief or prolonged, and where a physician or other authorized certifier with knowledge of the decedent's diagnoses through medical attendance, is willing to complete the medical portion on the death certificate, and funeral arrangements are made.
- We Will Issue (WWI): Any case where the ACOME must issue a death certificate due to legal/statute guidelines and the cause and manner of death can be determined without a pathological examination.
- Other: (not inclusive)
 - Bones/Tissue Non-Human: Any case that is composed of bones or tissue, which are confirmed to be non-human examined by a Forensic Pathologist or outside consultant. In the event bones or tissue are determined to be human the disposition will be updated to appropriate disposition.
 - Donor After Cardiac Death (DCD): Any case that the decedent's NOK and the regional Organ Procurement Organization are pursuing rapid recovery of organs. An investigation will be performed into the circumstances surrounding the death prior to final approval or denial by ACOME.

ACOME maintains statistical data on which decedents are physically brought to ACOME whether for storage purposes or for examination purposes.

Cases Transported to ACOME Disposition, 2021	
Morgue	1,419
We Will Issue/Storage	1,407
Autopsy-Fee for Service	2
Out of County	2
No Jurisdiction	8,509
No Jurisdiction/Storage	144
Unknown Bones/Tissue Non-Human	17
Total	11,500

MORGUE OPERATION SERVICES

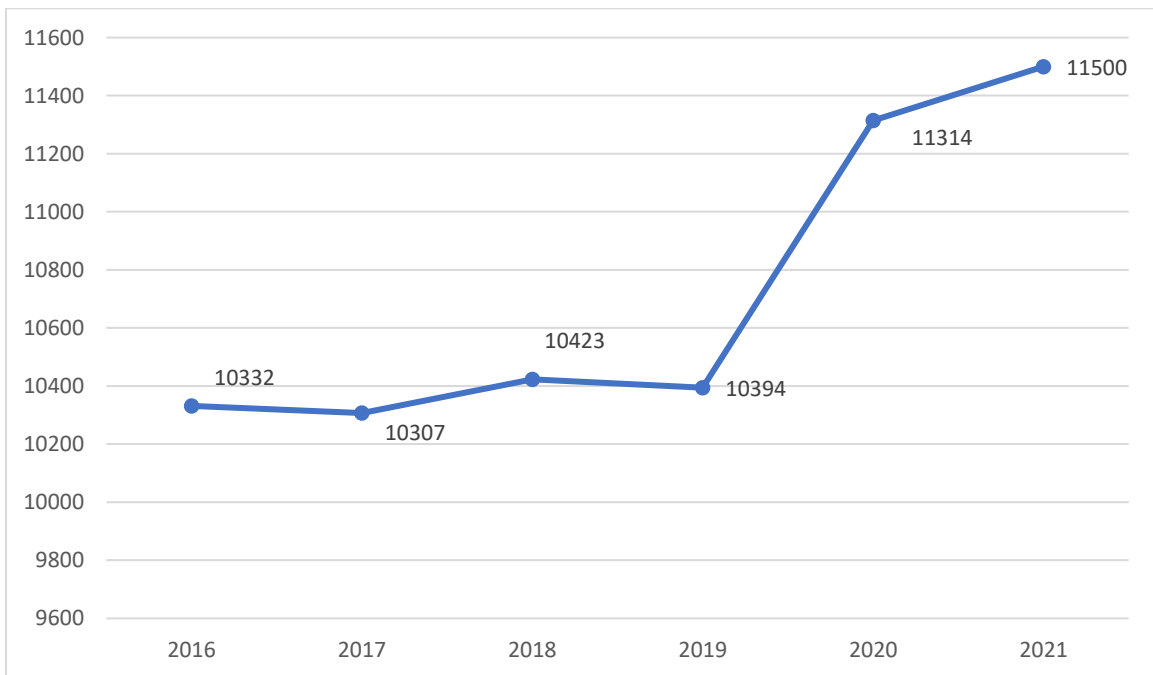
Total Deaths Reported to ACOME in 2021



Deaths Reported to ACOME 2016-2021



From 2016 – 2019 the number of reported deaths stabilized, but in 2020 a notable increase is seen.



MORGUE OPERATION SERVICES

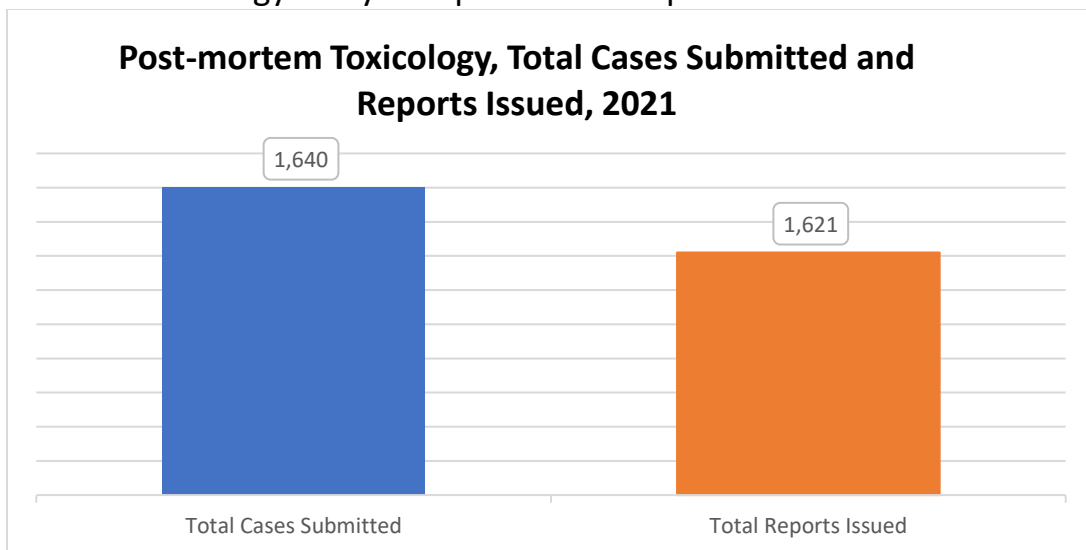
Pathological Examinations

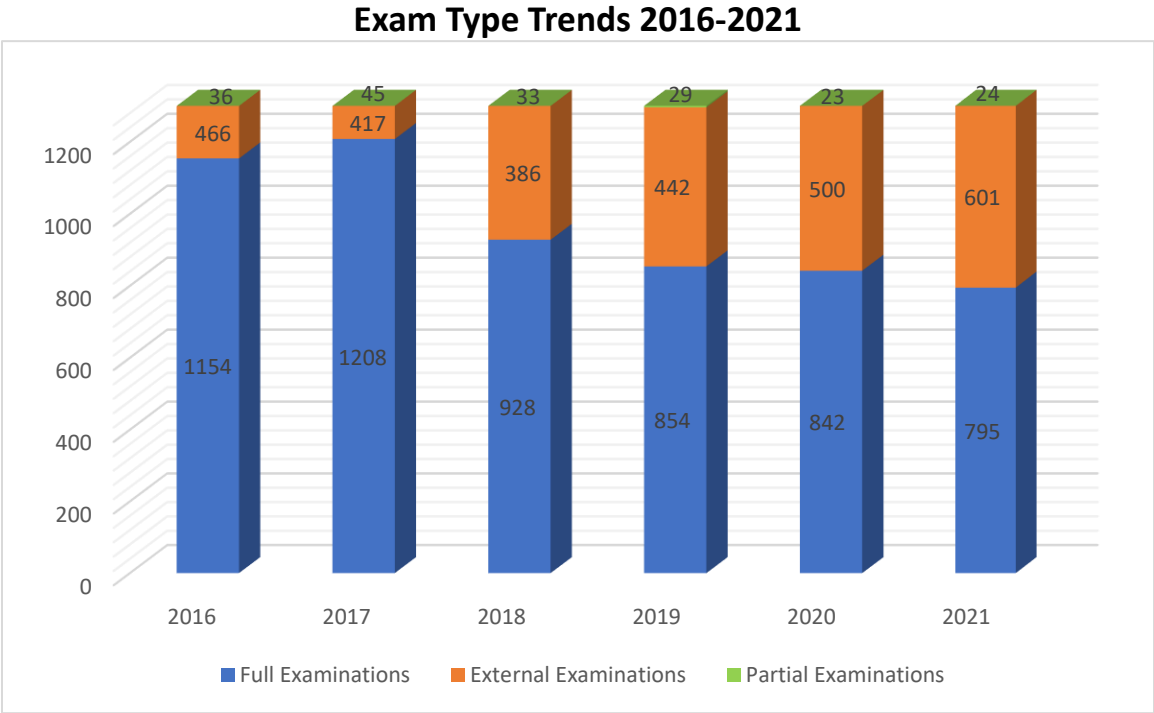
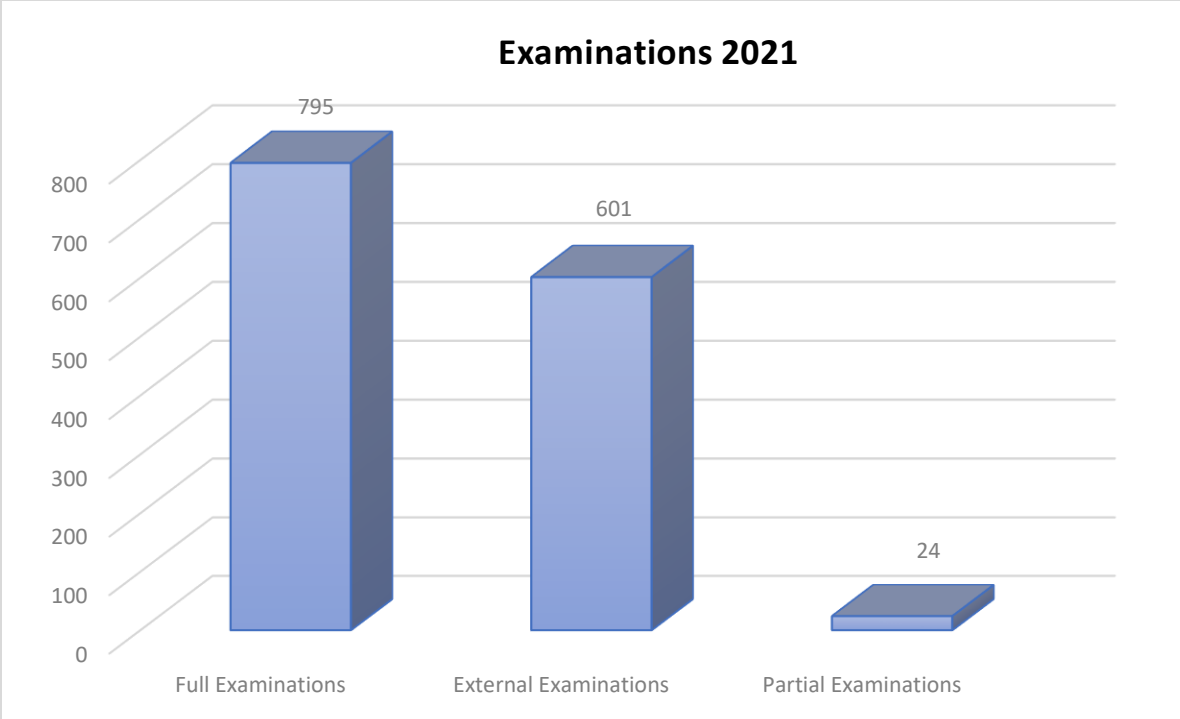
Pathological examinations are conducted in the Morgue Operations Divisions at the discretion of the Medical Examiner based upon case circumstance. There are several types of pathological examinations that may be conducted, and each are determined by the on-call pathologist based on the case information available.

Full examinations, or often referred to as “complete examinations” are pathological examinations in which an external and internal examination are conducted as well as specimens collected for toxicological analysis. An internal examination is defined as the examination of the body to include opening the body cavity for examination of the organs. The external examination is defined as the examination of the exterior of the body without opening the cavities or examining the various organs, but specimens are collected for toxicological examination. An external examination is limited to situations where examination of organs or body cavities is not believed to affect the determination of the cause and manner of death.

Partial examinations are to be performed in cases in which there is one obvious cause of death and there is no likely information to be gleaned from the performance of an internal examination that would be useful to the courts or investigating agencies. This may include examinations of only the head or only the torso.

Post-mortem toxicology analysis is performed as part of the examination.

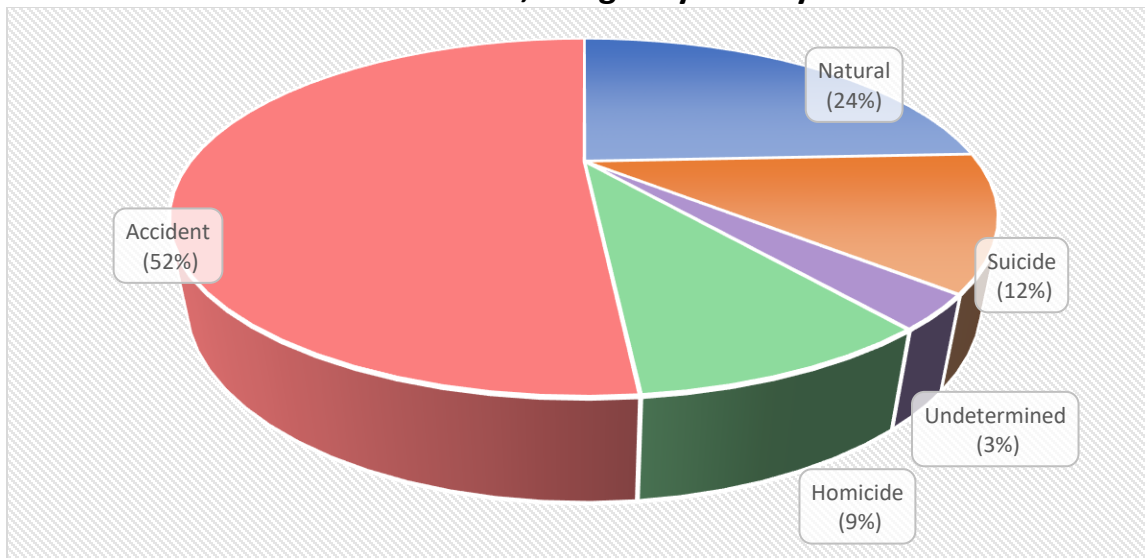




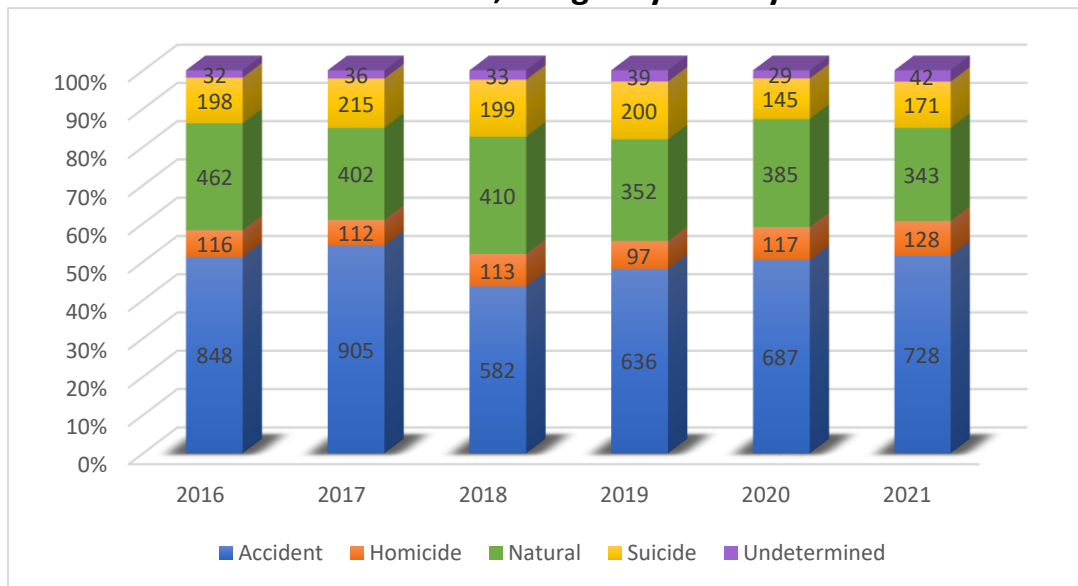
MORGUE OPERATION SERVICES

ACOME Morgue Operations is tasked with determining Cause and Manner of Death. The cause of death is the disease/injury that started the sequence of events leading directly to death or the circumstances of the accident or violence that produced the fatal injury. The manner of death is the determination of how the injury or disease leads to the death. One of five manners of death may be assigned. Those include: natural, accident, suicide, homicide, and undetermined. A status of “Pending” for manner of death is often used while awaiting further test results.

Manner of Death, Allegheny County Cases 2021

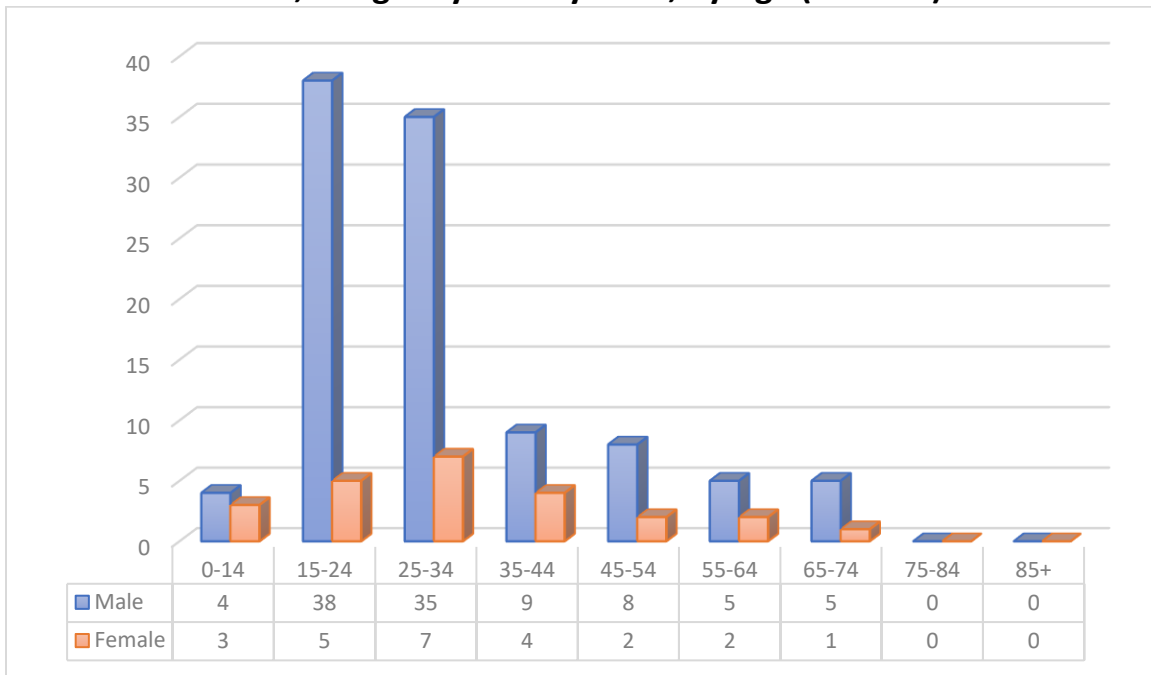


Manner of Death Trends, Allegheny County 2016 – 2021

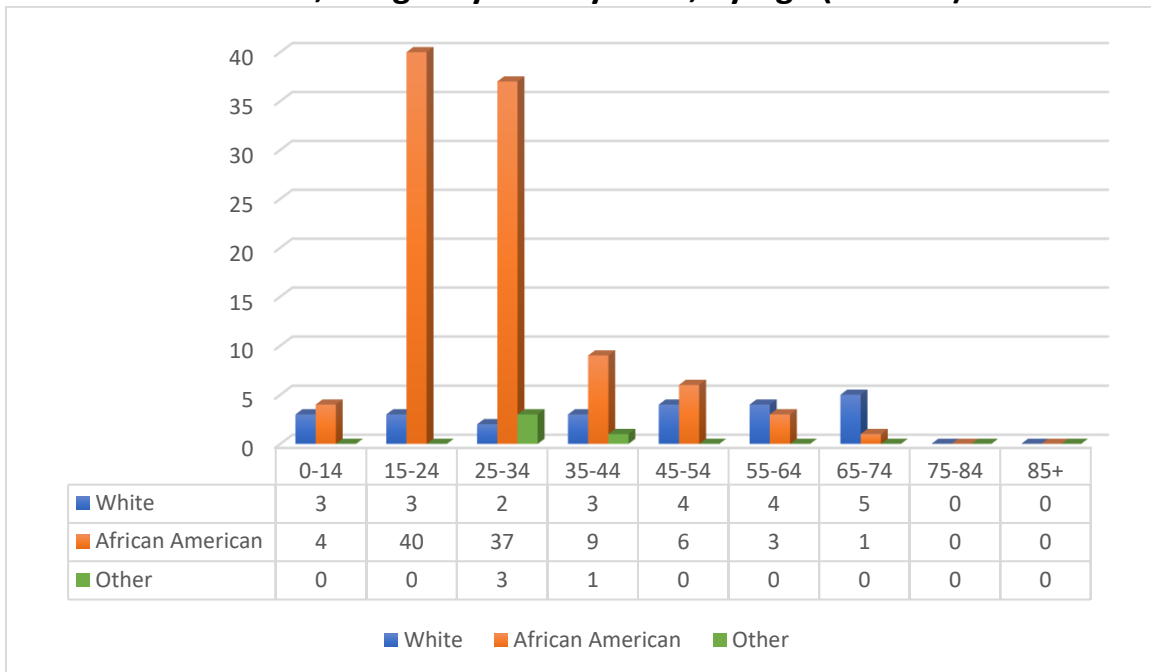


Manner of Death: Homicide

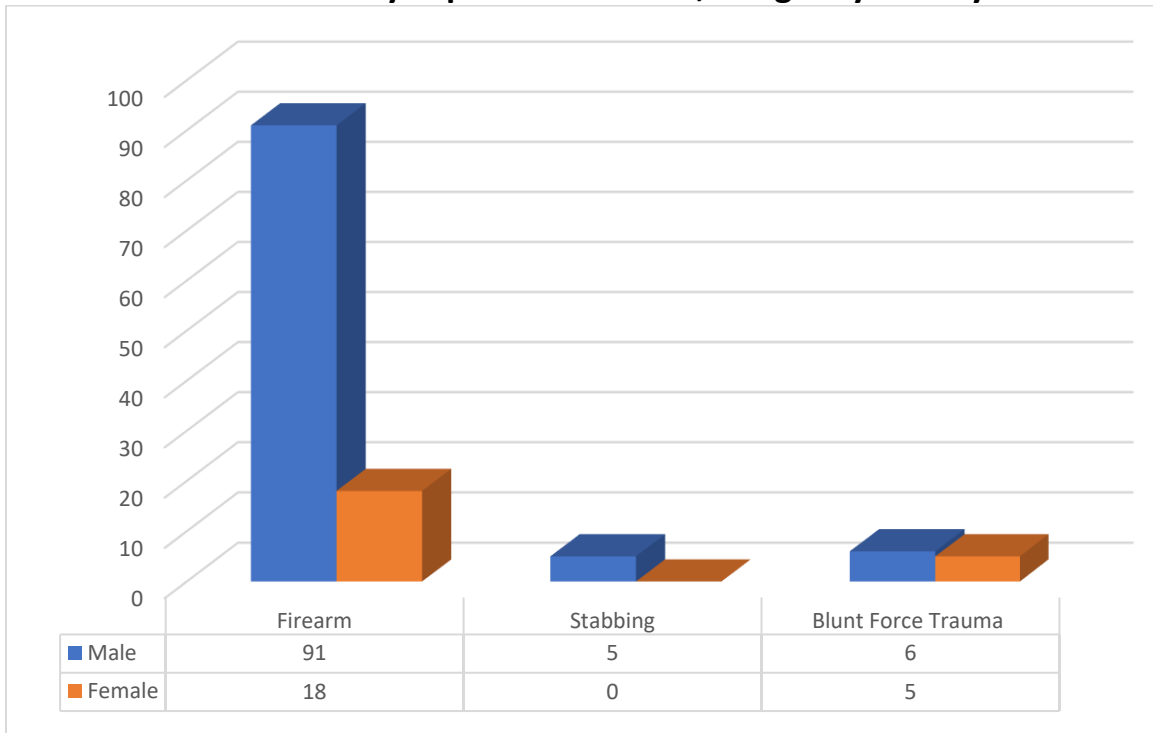
Homicide Deaths, Allegheny County 2021, by Age (In Years) and Gender



Homicide Deaths, Allegheny County 2021, by Age (In Years) and Race

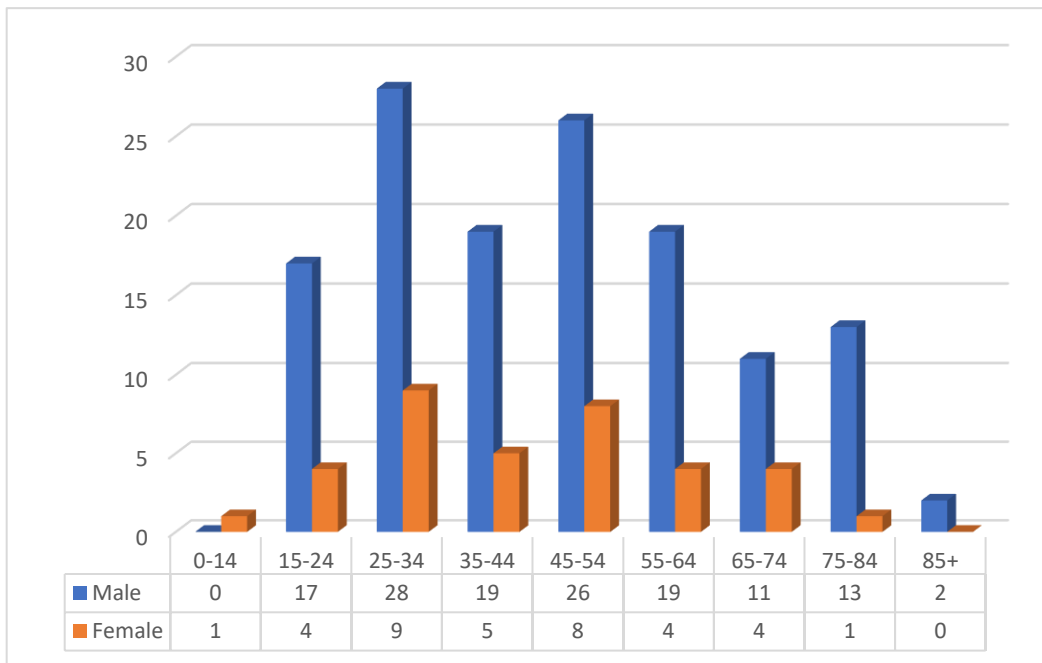


Homicide Deaths by Top 3 Mechanisms, Allegheny County 2021

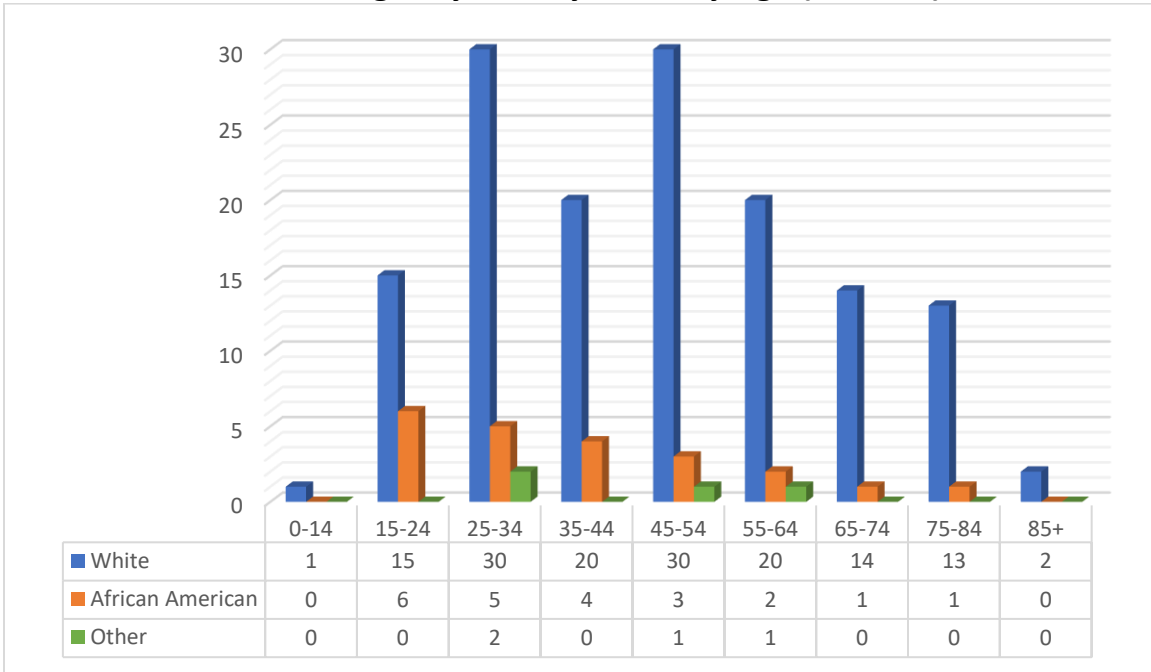


Manner of Death: Suicide

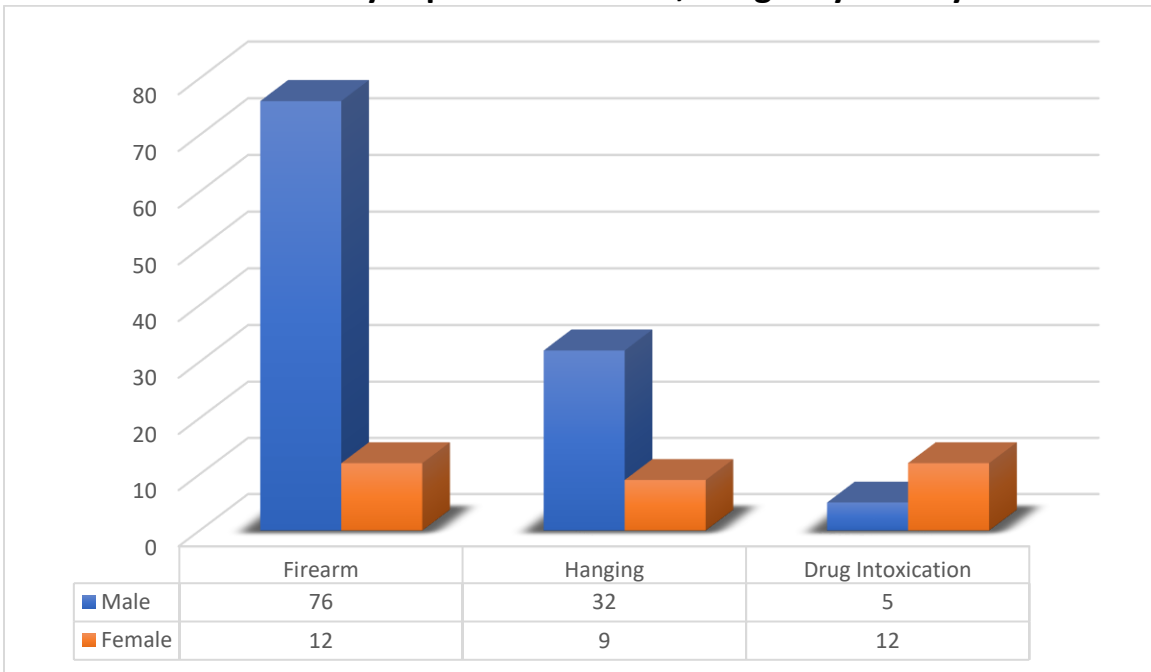
Suicide Deaths, Allegheny County 2021, by Age (In Years) and Gender



Suicide Deaths, Allegheny County 2021, by Age (In Years) and Race

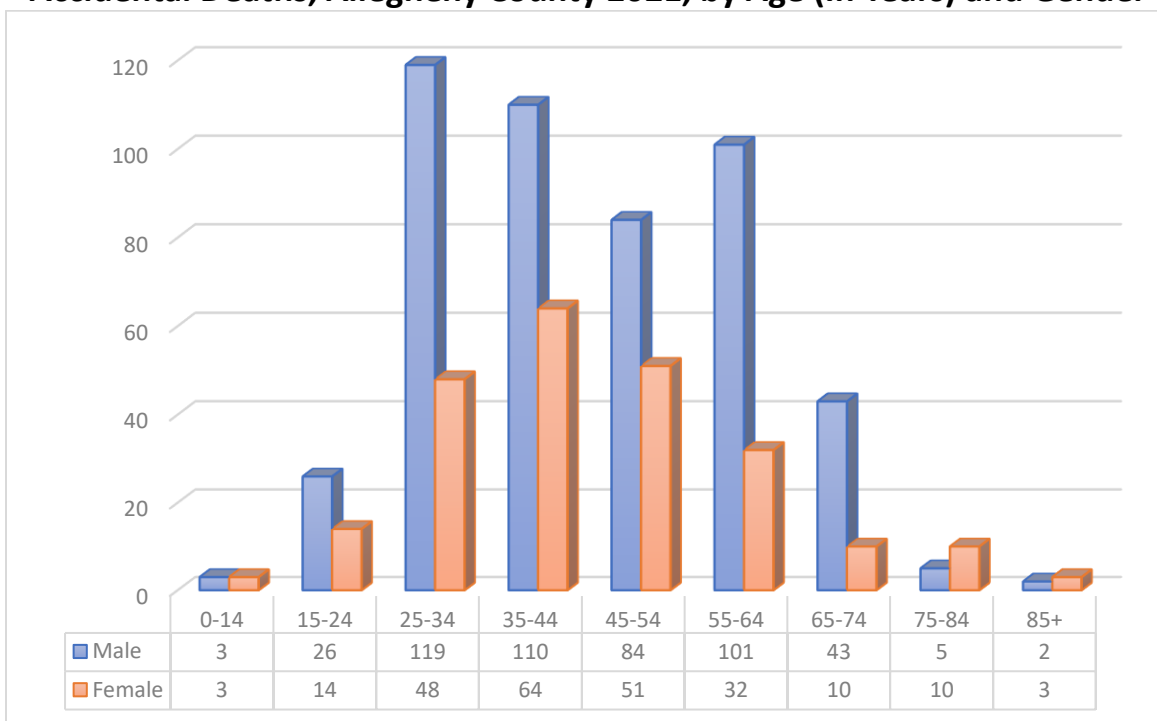


Suicide Deaths by Top 3 Mechanisms, Allegheny County 2021

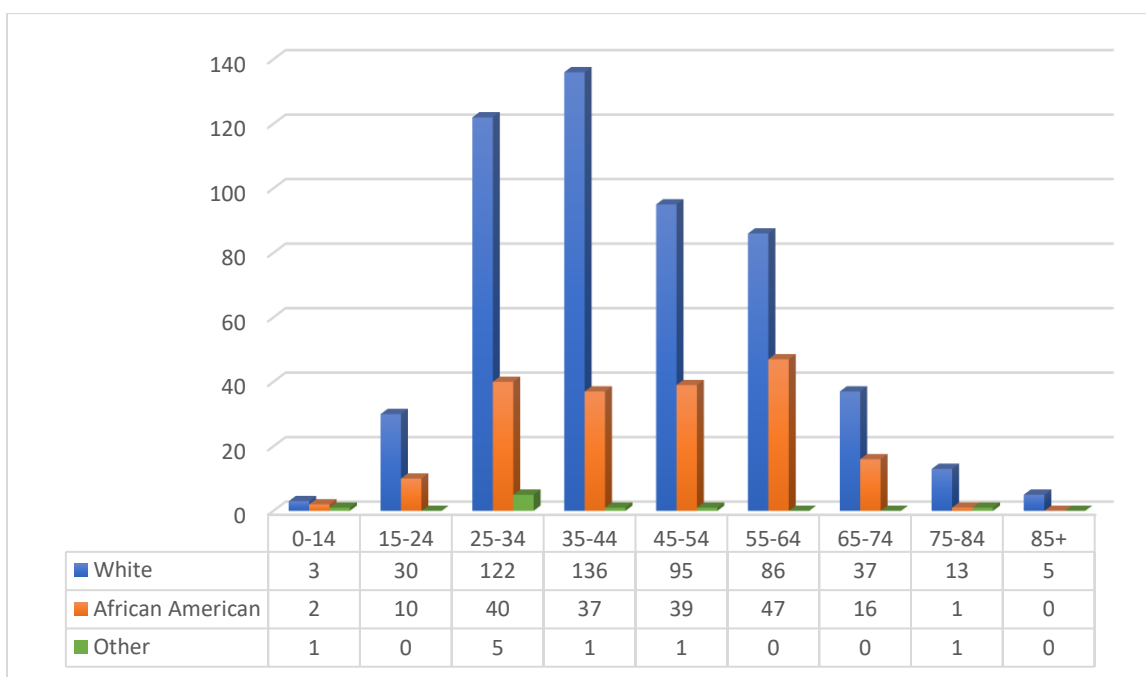


Manner of Death: Accident

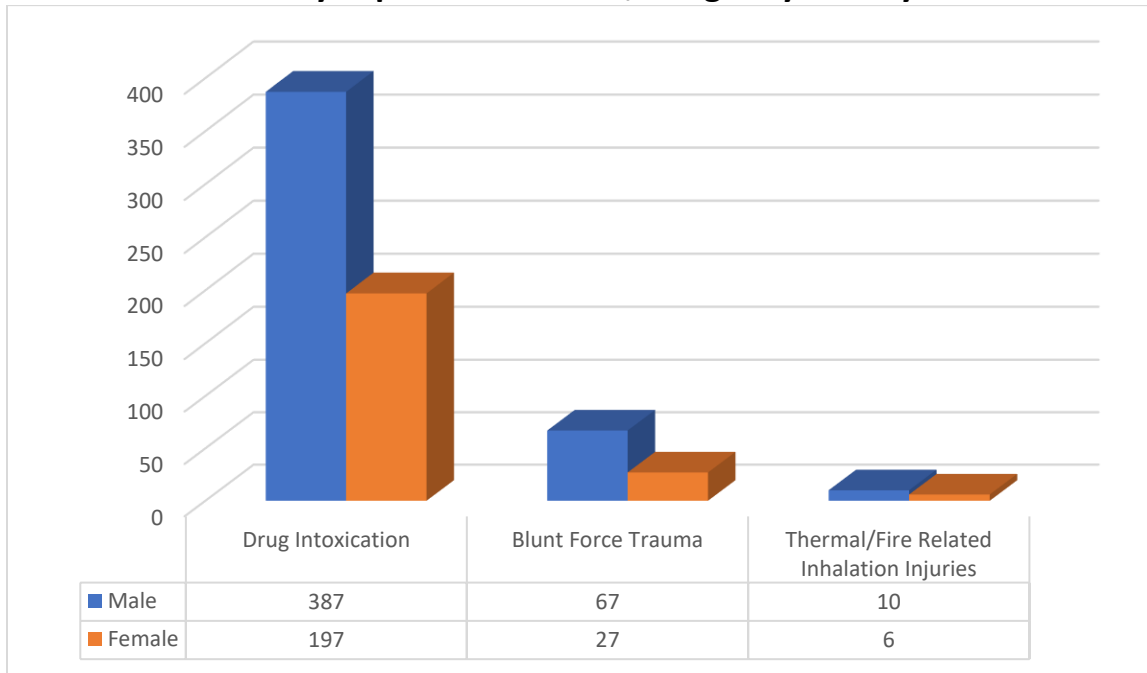
Accidental Deaths, Allegheny County 2021, by Age (In Years) and Gender



Accidental Deaths, Allegheny County 2021, by Age (In Years) and Race

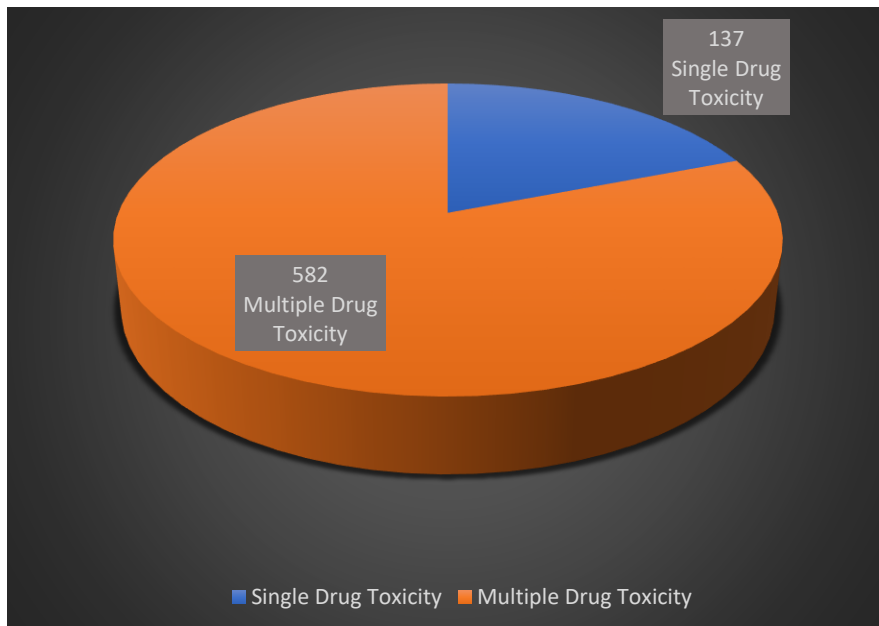


Accidental Deaths by Top 3 Mechanisms, Allegheny County 2021

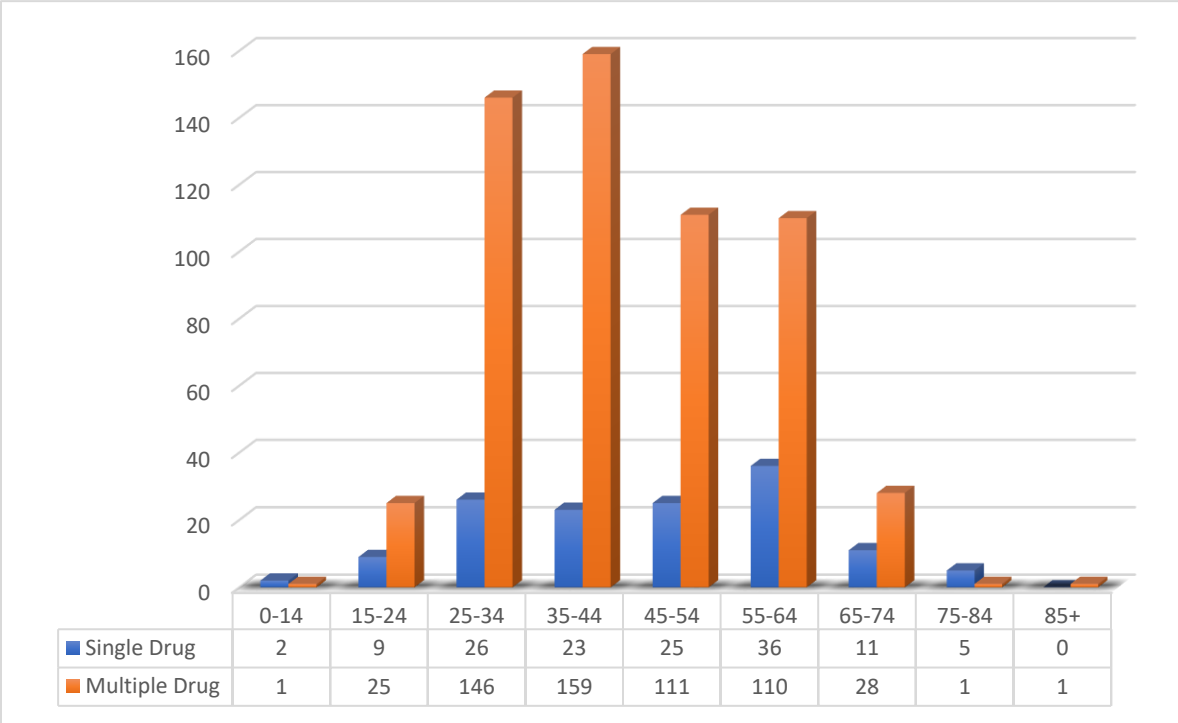


Accidental Overdose Deaths in Allegheny County In 2021

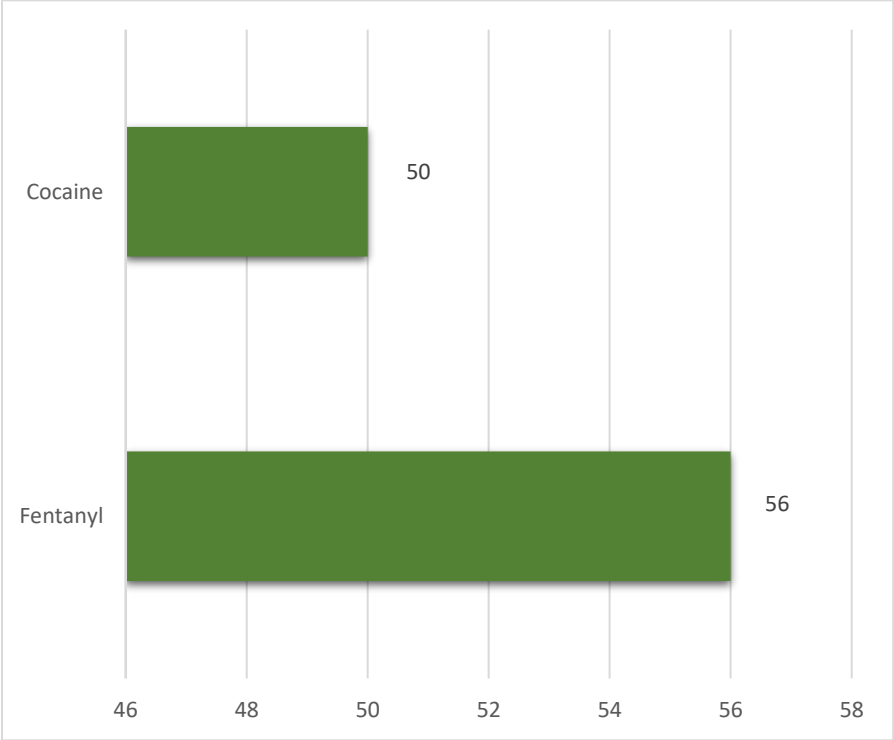
Multiple Drug Toxicity Versus Single Drug Toxicity



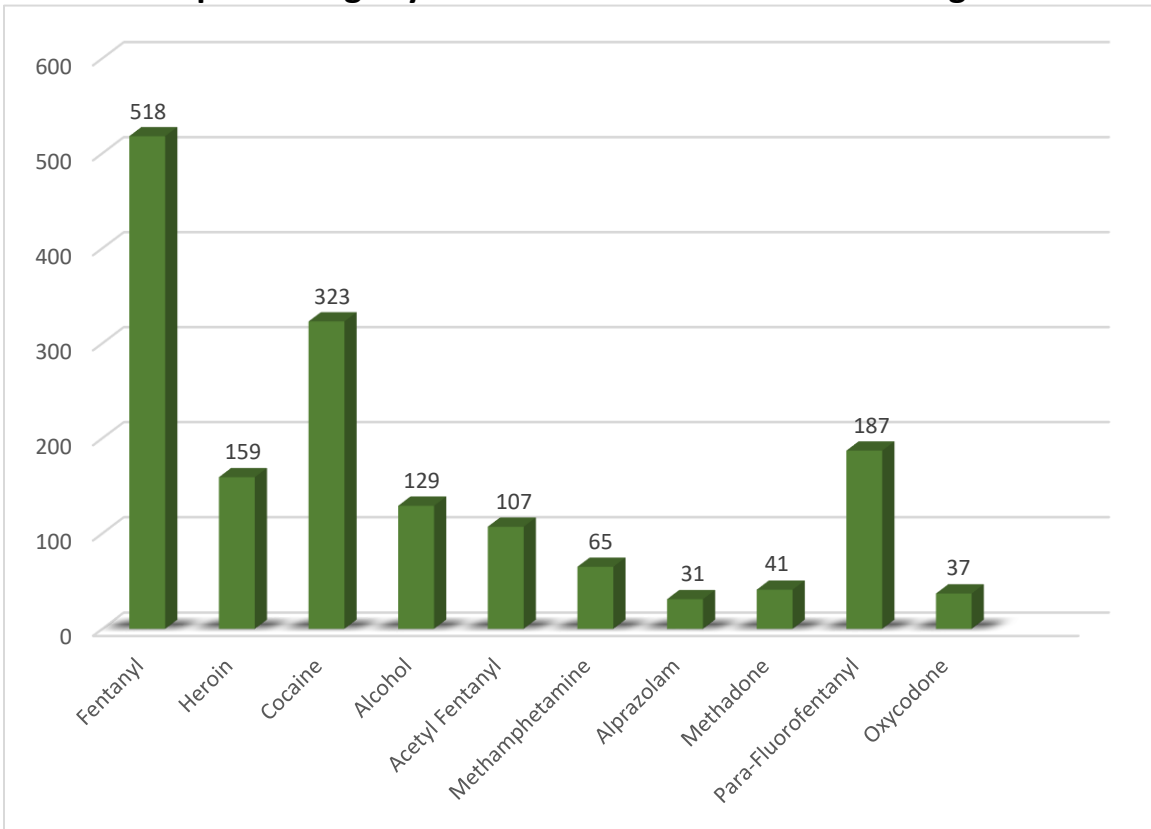
Accidental Drug Deaths by Age (In Years), Allegheny County 2021, Single Drug and Multiple Drug



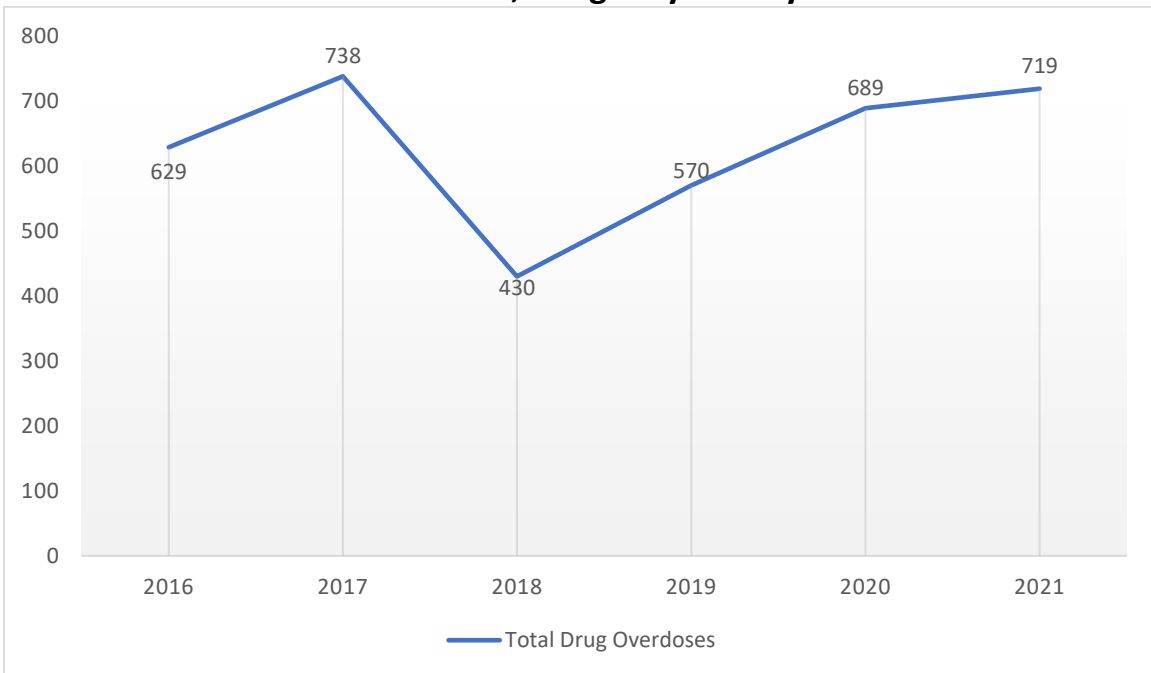
Drugs in Single Drug Accidental Overdose Deaths (Top 2), 2021



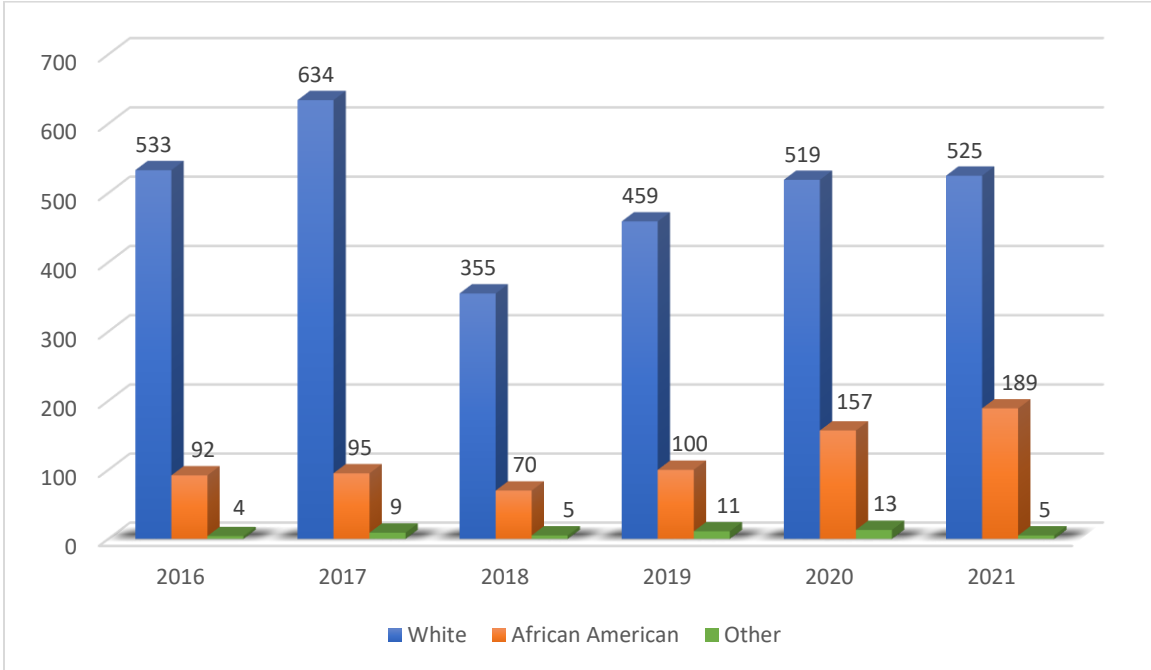
2021 Top Ten Drugs by Rank in Combined Accidental Drug Deaths



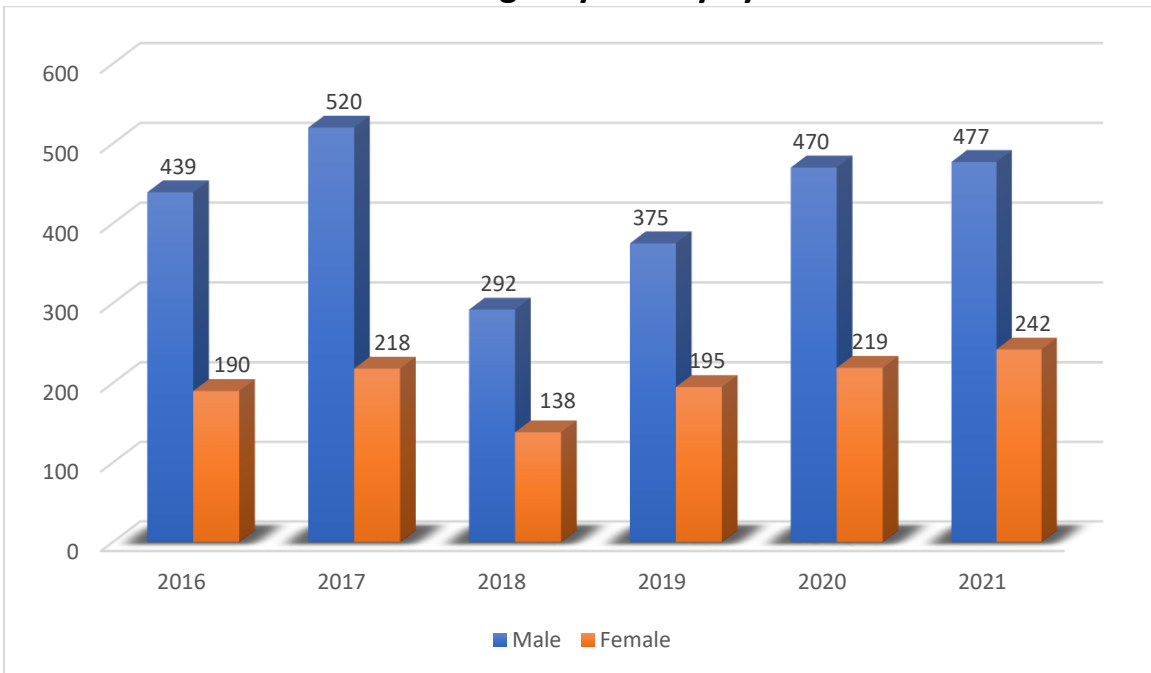
Accidental Overdose Deaths, Allegheny County Trends 2016-2021



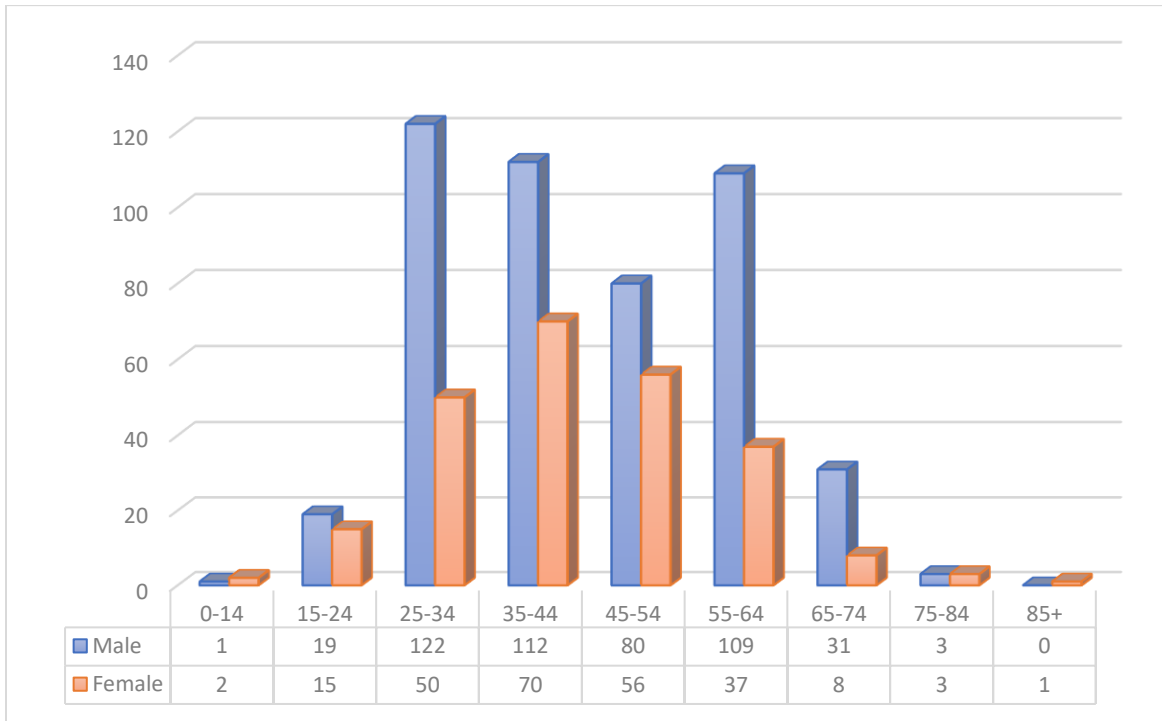
Accidental Overdose Deaths by Race, Allegheny County Trends 2016-2021



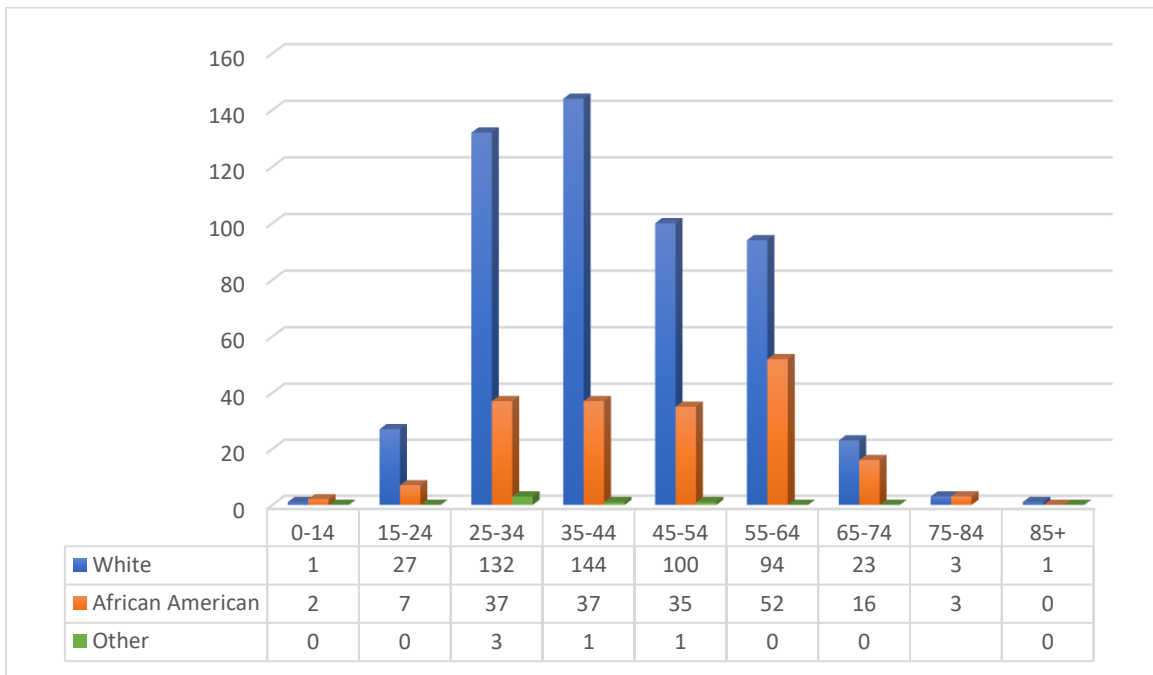
Accidental Overdose Deaths Allegheny County by Gender Trends 2016-2021



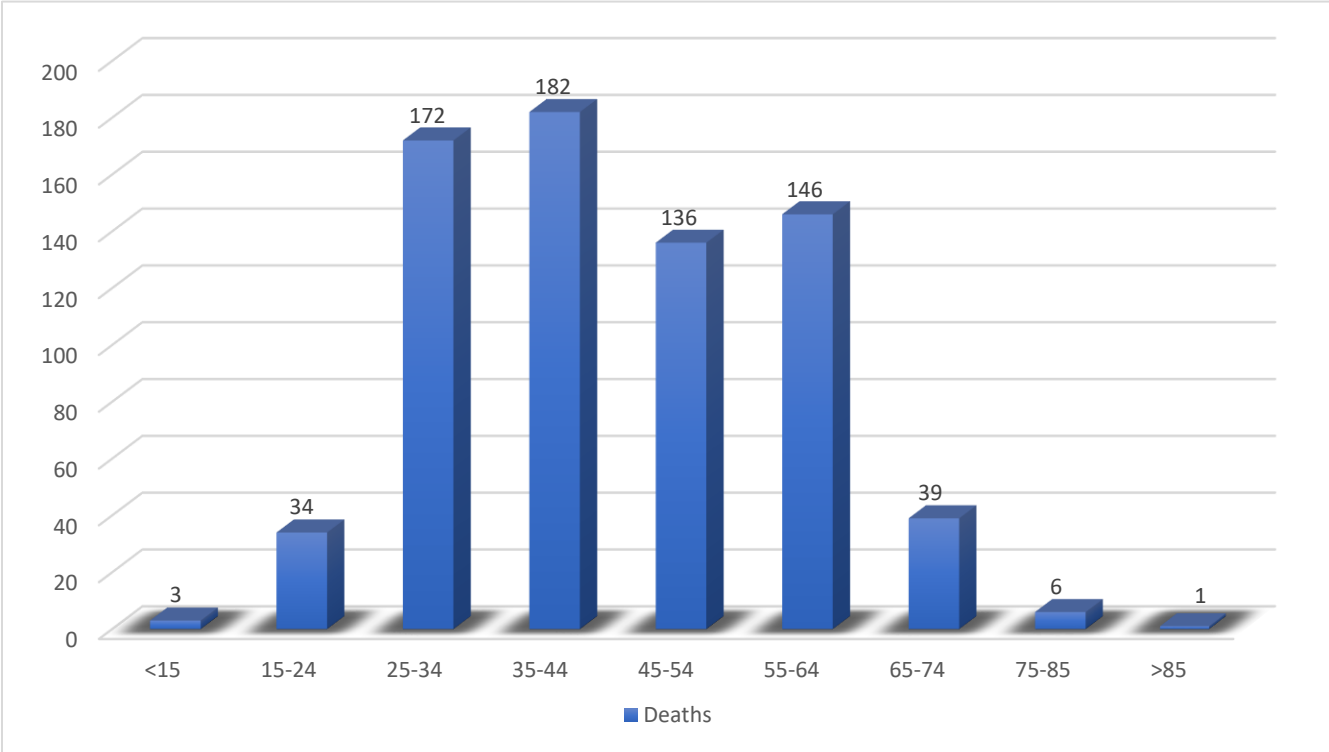
Accidental Overdose Deaths, Allegheny County 2021, by Age (In Years) and Gender



Accidental Overdose Deaths, Allegheny County 2021, by Age (In Years) and Race

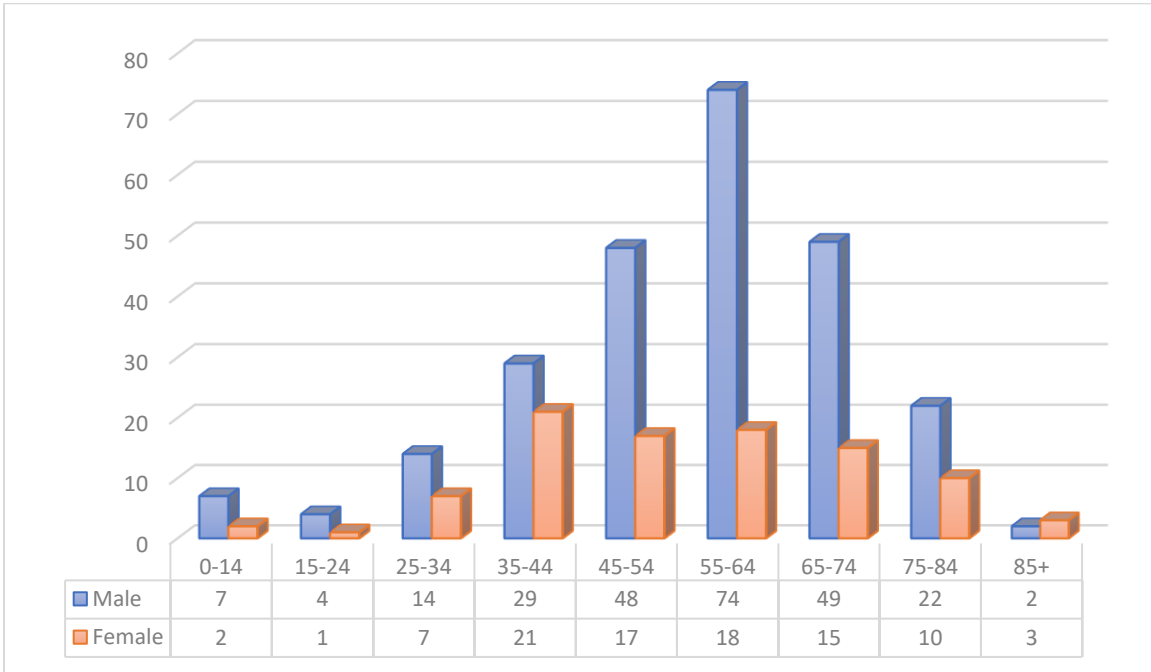


Accidental Overdose Deaths 2021 Allegheny County by Age (In Years)

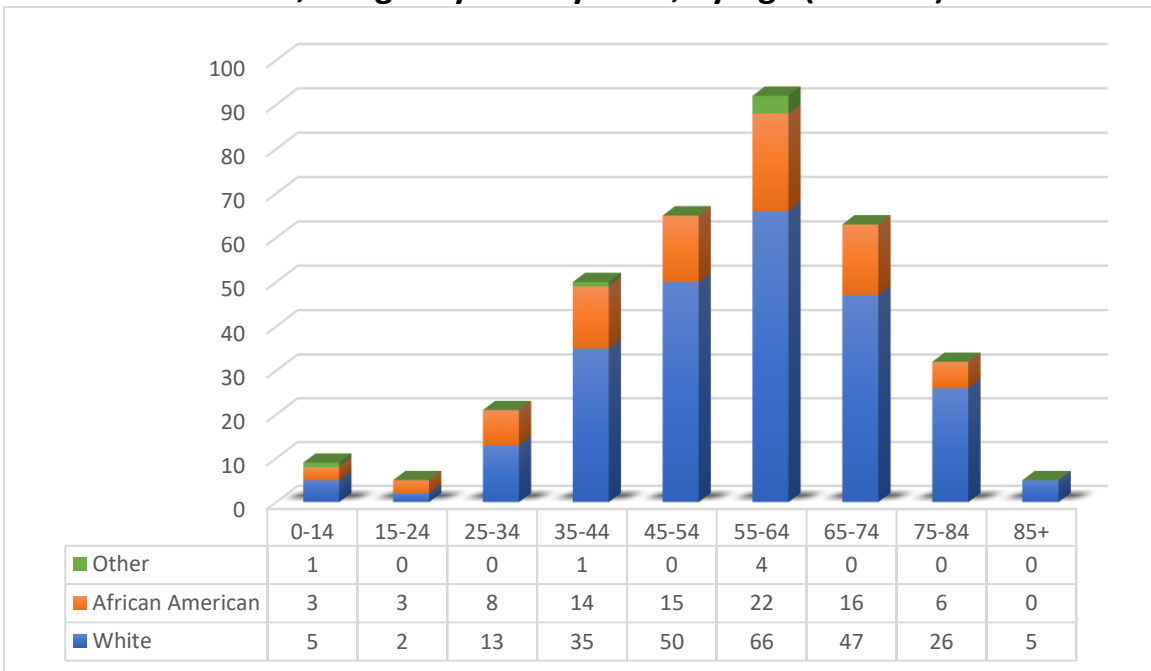


Manner of Death: Natural

Natural Deaths, Allegheny County 2021, Examined by ACOME by Age (In Years) and Gender

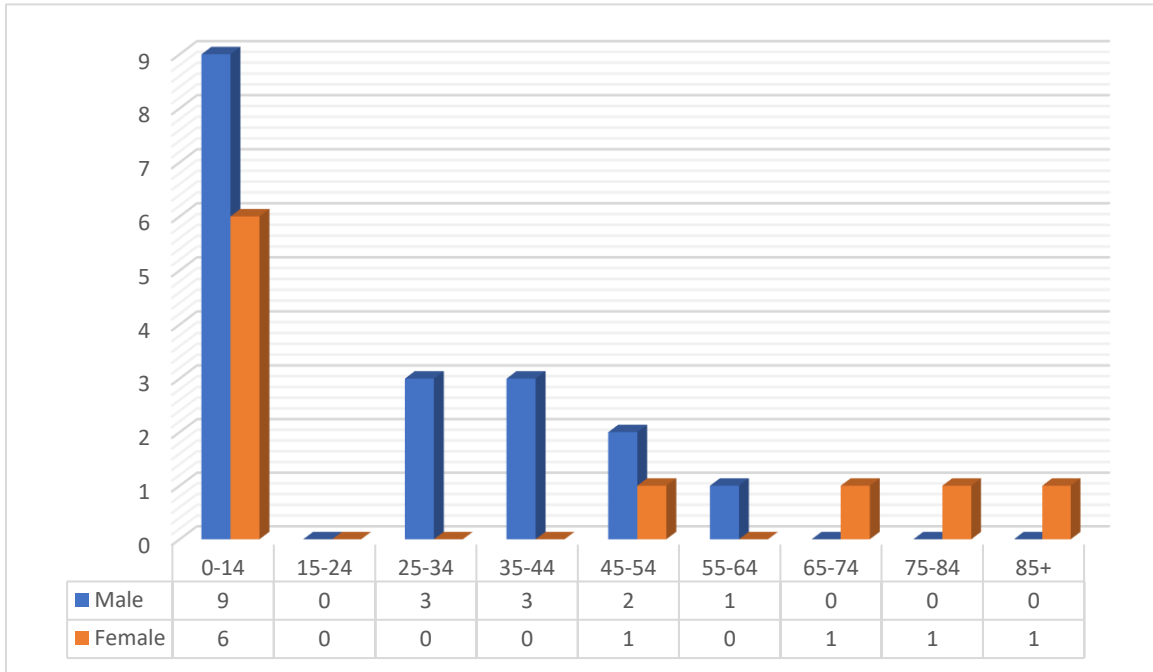


Natural Deaths, Allegheny County 2021, by Age (In Years) and Race



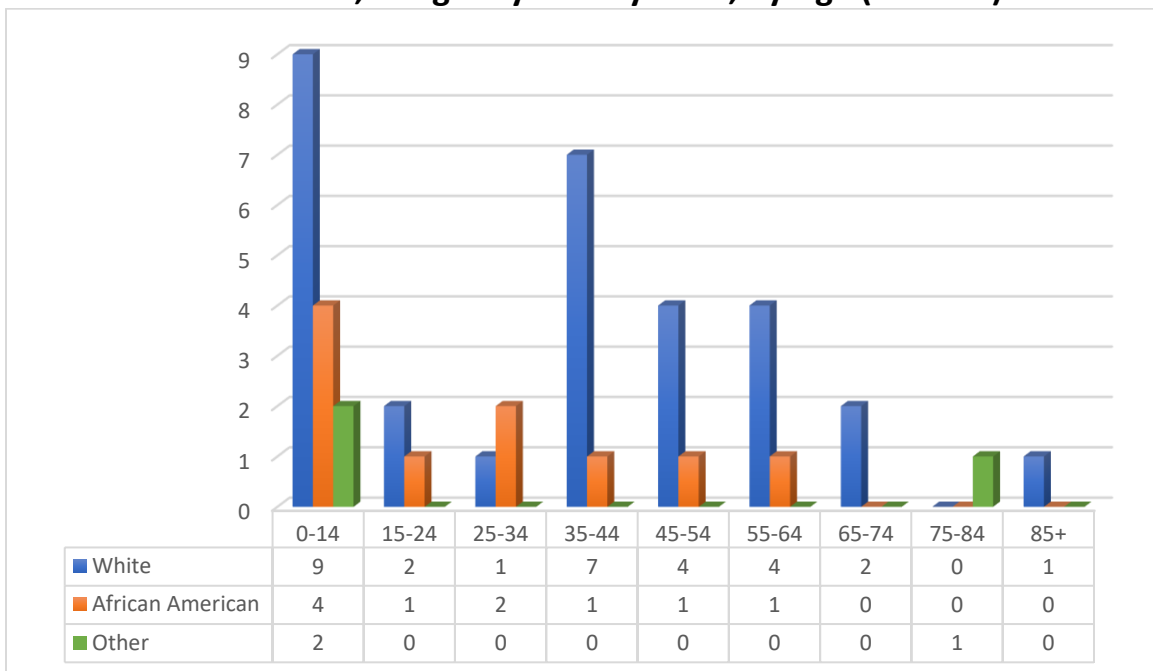
Manner of Death: Undetermined

Undetermined Deaths, Allegheny County 2021, by Age (In Years) and Gender



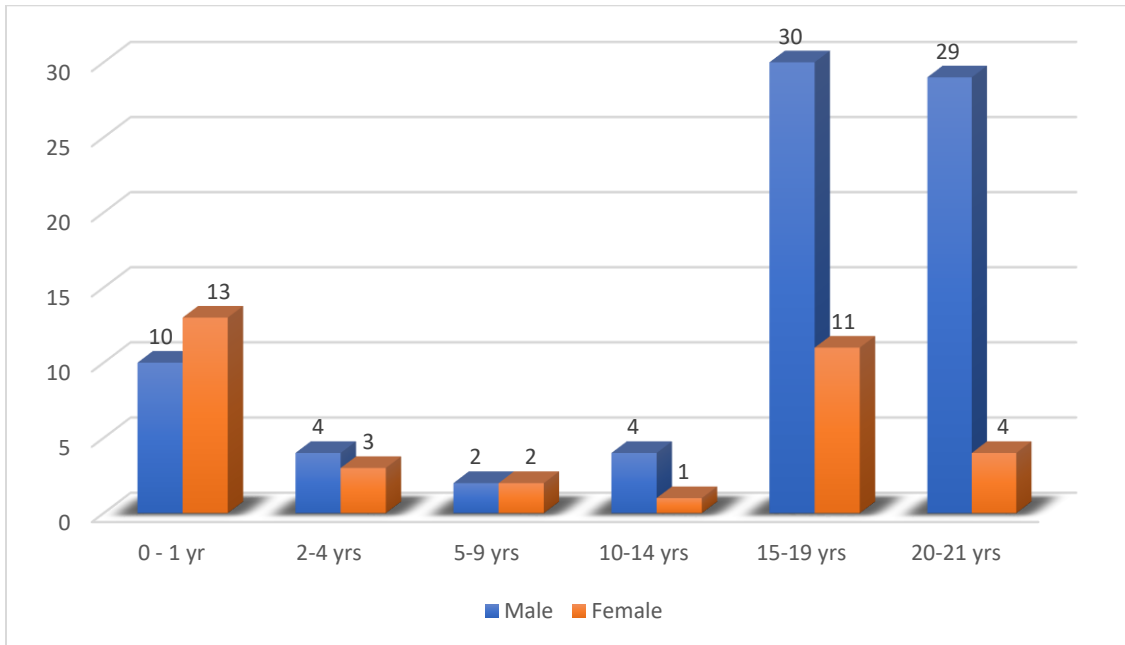
* Sudden Unexplained Infant Death is often assigned a Manner of Undetermined; please refer to “Deaths Involving Children”

Undetermined Deaths, Allegheny County 2021, by Age (In Years) and Race

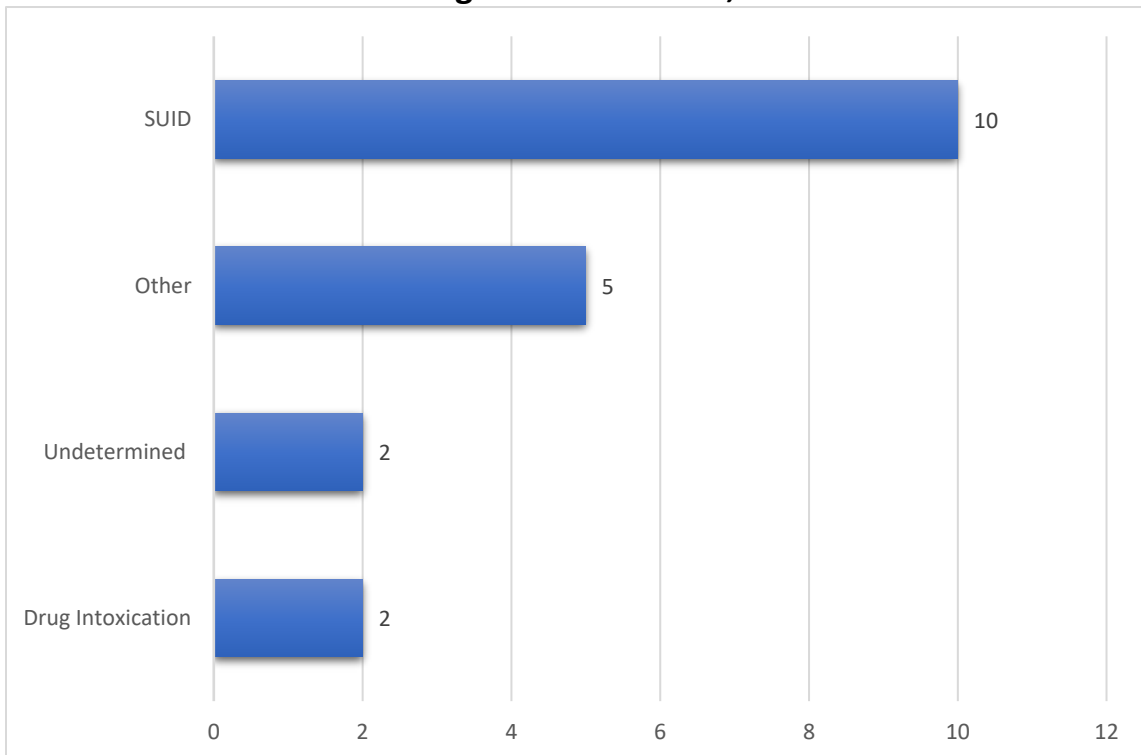


Deaths Involving Children

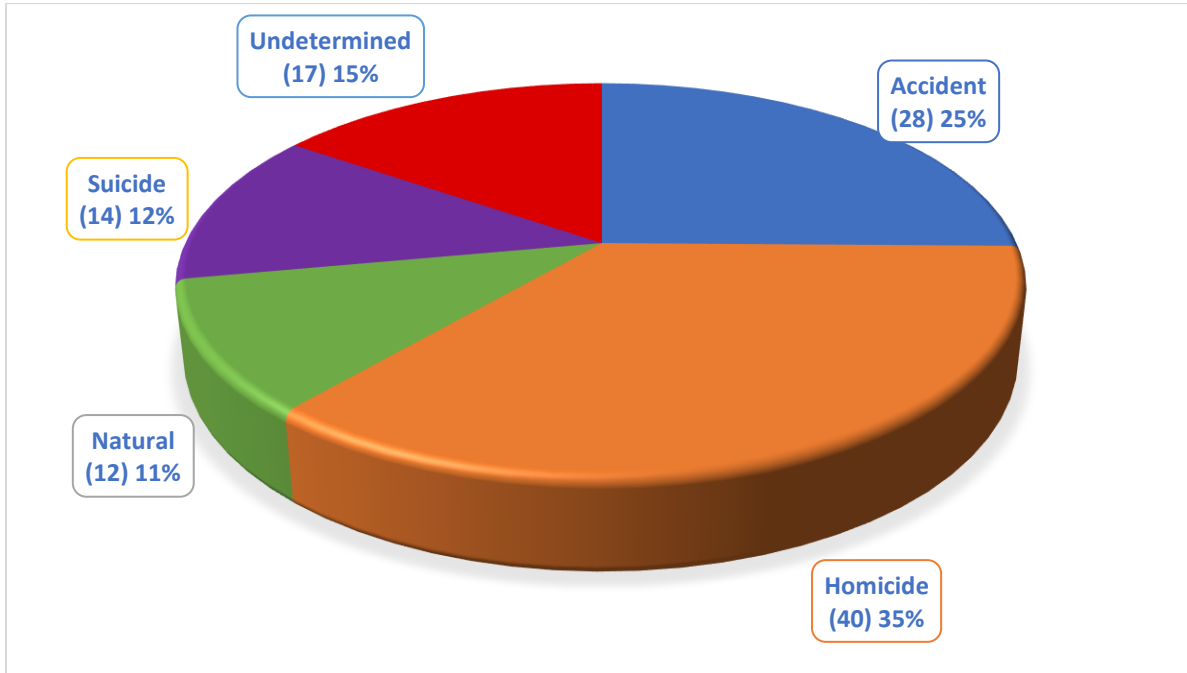
Child Death Cases with an ACOME Pathological Examination by Age and Gender, 2021



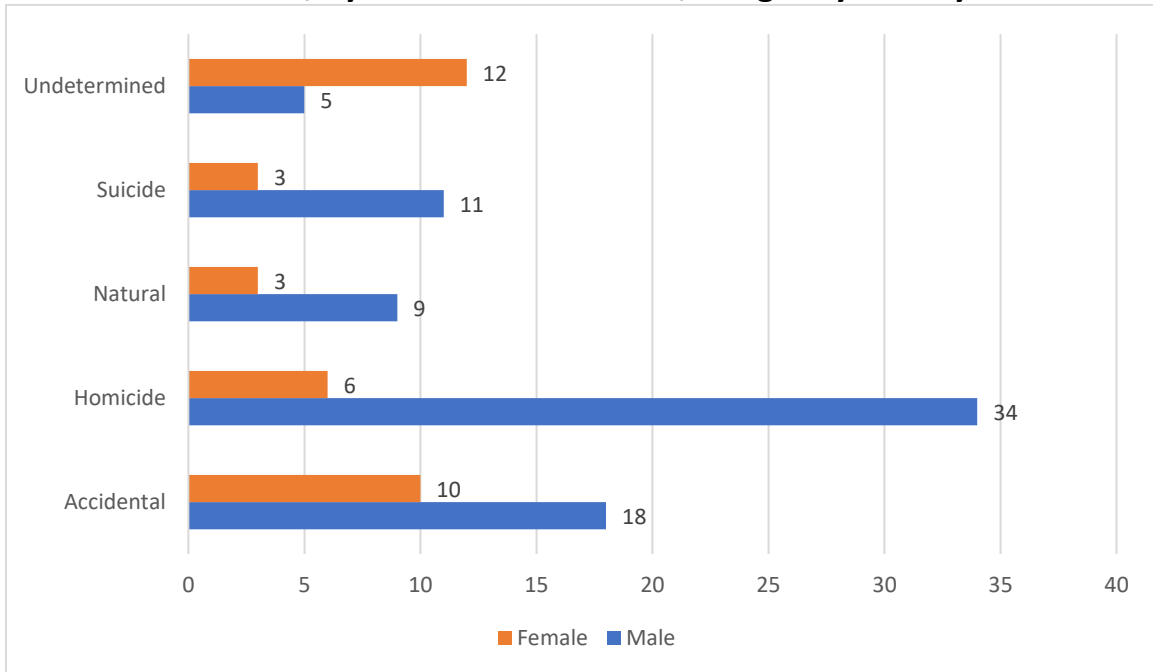
Infant Deaths (Under the Age of One Year) by Mechanism, with an ACOME Pathological Examination, 2021



Child Deaths by Manner of Death (0-22 years of age) 2021



Child Deaths, by Manner and Gender, Allegheny County 2021

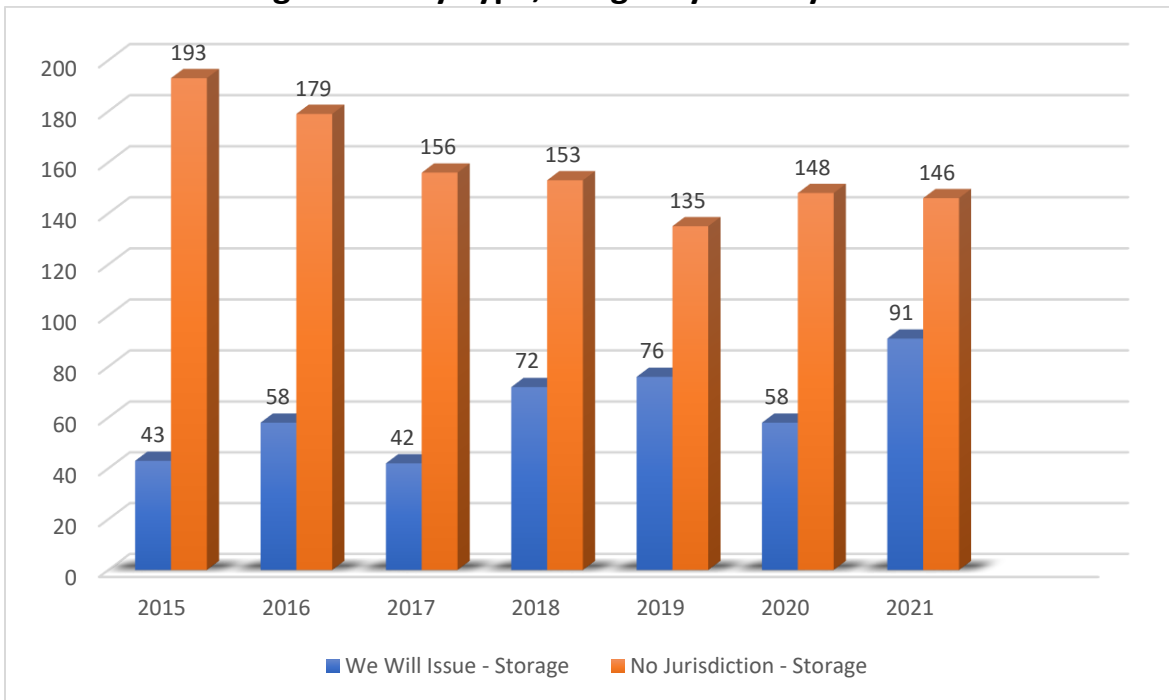


Storage and Unclaimed Remains

ACOME Morgue Operations become involved at the onset of the death investigation to determine jurisdiction and then continue with involvement until the decedent is released to the funeral home chosen by the next of kin.

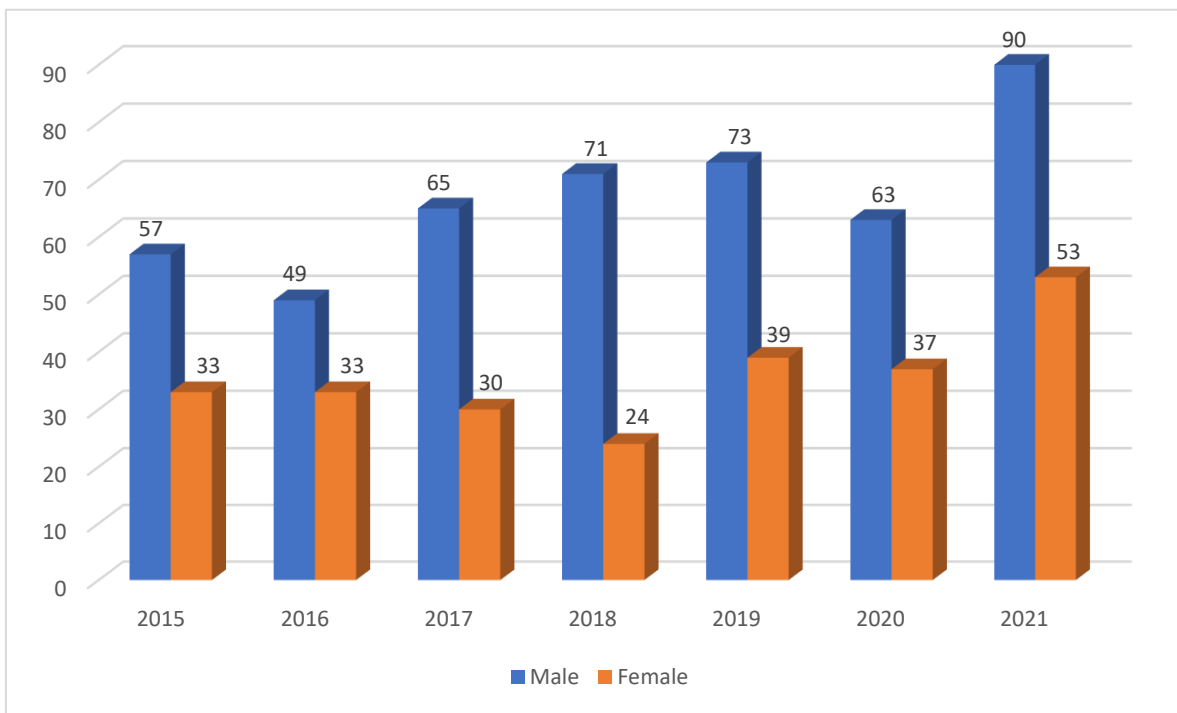
Frequently, ACOME takes responsibility of the decedent for storage purposes until either the next of kin is located or until final disposition arrangements are confirmed.

Storage Cases by Type, Allegheny County 2015-2021



When there is no next of kin, family, or friends that are available and/or able to decide, the Office of the Medical Examiner will provide disposition for the decedent. The decedent is considered unclaimed. Below displays the unclaimed decedents in which ACOME provided disposition.

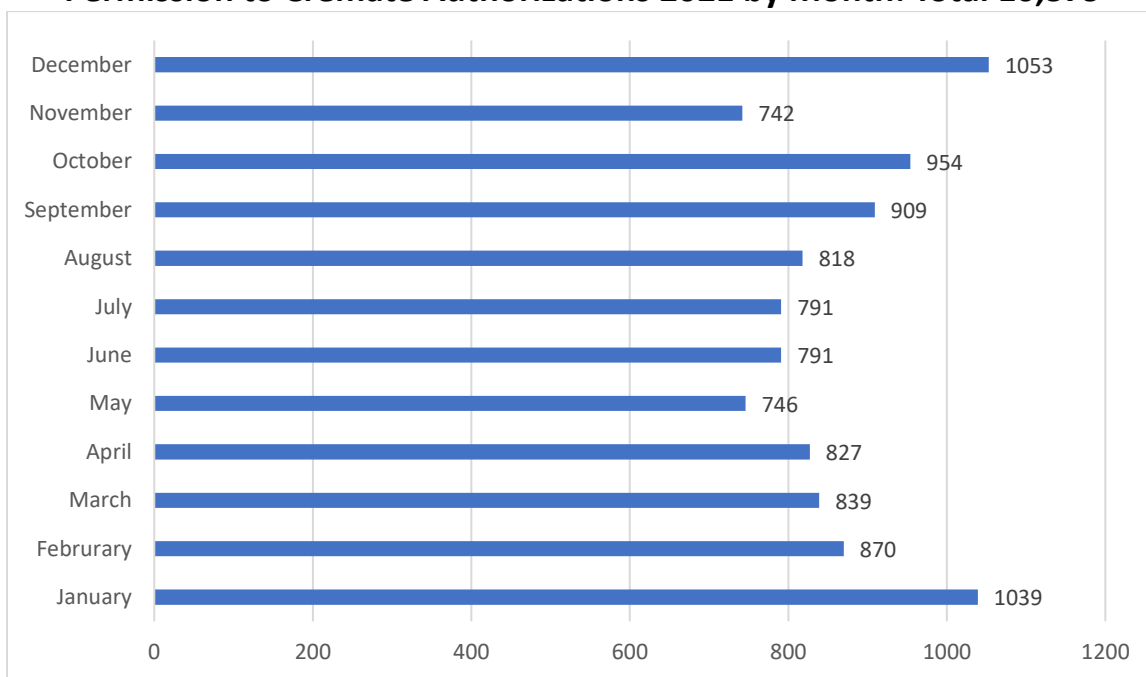
Unclaimed Remains by Gender, Allegheny County 2015 – 2021



Cremation Authorizations

ACOME is responsible for authorizing all cremations request for decedents of Allegheny County. Any funeral home, regardless of their location, that intends to cremate a decedent who passed in Allegheny County must request authorization from ACOME. ACOME will determine if authorization is granted upon review of the formal request and a valid and complete PA State Death Certificate.

Permission to Cremate Authorizations 2021 by Month: Total 10,379



Exhumations

ACOME has not participated in any needs for exhumation from 2015-2021.

Organ and Tissue Donation

Decedents who fall under the jurisdiction of the Medical Examiner may also receive authorization, with the permission of the family, to donate their organs or tissue. In 2021 ACOME cases constituted 183 tissue donors, 43 organ donors and 43 donors who donated organs and tissue.

FORENSIC LABORATORY SERVICES

Evidence Receiving: Personnel in Evidence Receiving are responsible for receiving, processing, securing and maintaining the chain of custody for evidence in various types of cases submitted by agencies including but not limited to law enforcement personnel, health department, or emergency services. Because evidence may be examined by different sections under the control of the laboratory system, staff involved in the process must conform to strict protocols and policies. All evidence movement is documented via the chain of custody section in Laboratory Information Management System (LIMS).

Forensic Biology: The Forensic Biology Section performs serological and DNA analyses on physiological fluids and other nucleated cellular material for identification and individualization. The type of material typically examined includes, but is not limited to, blood, semen, saliva, tissue, and "touch" items collected at crime scenes and from articles of physical evidence. Evidence of these types is frequently generated during the commission of violent crimes such as homicides, sexual assaults, assaults, and hit and run fatalities, as well as less violent crimes including burglary, theft and firearms violations. The goal of the Forensic Biology Section is to identify what type of material is present and use DNA analysis to link that material to a specific person. The Forensic Biology Section is linked to the FBI CODIS (Combined DNA Index System) database network. After a DNA profile is obtained, it can be searched against local, statewide, and national law enforcement databases. Through this network, the laboratory can search an unidentified profile against unsolved case profiles and known profiles of convicted offenders and arrestees throughout the country. These searches can link cases together or provide important investigational leads for investigators on unsolved cases.

Drug Chemistry: The Drug Chemistry Section of the forensic laboratory analyzes evidence seized in the enforcement of state and federal laws. The drug chemists qualitatively identify controlled substances within the evidence submitted to them. The evidence submitted comes from various law enforcement agencies in Allegheny County and occasionally surrounding counties.

Toxicology: The Toxicology Section provides post-mortem forensic toxicology in

Medical Examiner's cases and human performance forensic toxicology services for Allegheny County law enforcement agencies and occasionally surrounding counties. Post-mortem fluids and tissues are tested for the presence of drugs and their metabolites, as well as other toxicants, including ethanol and other volatile substances, gases, such as carbon monoxide and cyanide and heavy metals. The blood levels of these toxicants are quantitated to aid in the determination of the cause and manner of death in Medical Examiner's cases. Toxicological analyses are also performed on blood and urine specimens submitted by law enforcement agencies to determine the presence of ethanol and other drugs which may modify human performance (i.e. the ability to operate a motor vehicle safely).

Environmental Chemistry: The Environmental Chemistry Laboratory provides analytical support for Allegheny County's Health Department. The laboratory specializes in analyzing air, and food samples which are submitted by trained field technicians. All analyses are performed by experienced chemists, utilizing state-of-the-art instrumentation.

Firearms/Toolmarks: The Firearms and Toolmarks Section examines firearms for operability and compares bullets, cartridge cases, and shot shell cases to determine if they were fired from the same firearm, multiple firearms or specific firearm, if submitted.

Each firearm submitted to the section is examined to determine whether it is in normal mechanical operating condition and it is test fired, when possible. The examination includes the operability of the safety features, physical characteristics of the firearm, determination of manufacturer, model and serial number. A microscopic comparison of ammunition components is done to attempt to identify a particular firearm as having fired the components. This section utilizes the National Integrated Ballistics Information Network (NIBIN) administered by the Bureau of Alcohol, Tobacco, Firearms and Explosives (BATFE) to acquire digital images of the markings on cartridges or shot shell cases recovered from a crime scene or test fires obtained from submitted semiautomatic pistols, semiautomatic, slide-action and bolt-action rifles and shotguns. The examiner compares images against previous NIBIN entries to attempt to link different crimes together. Toolmark examinations are conducted to determine if a toolmark was produced by the same tool or a specific tool, if submitted. Toolmarks may be encountered on a variety of

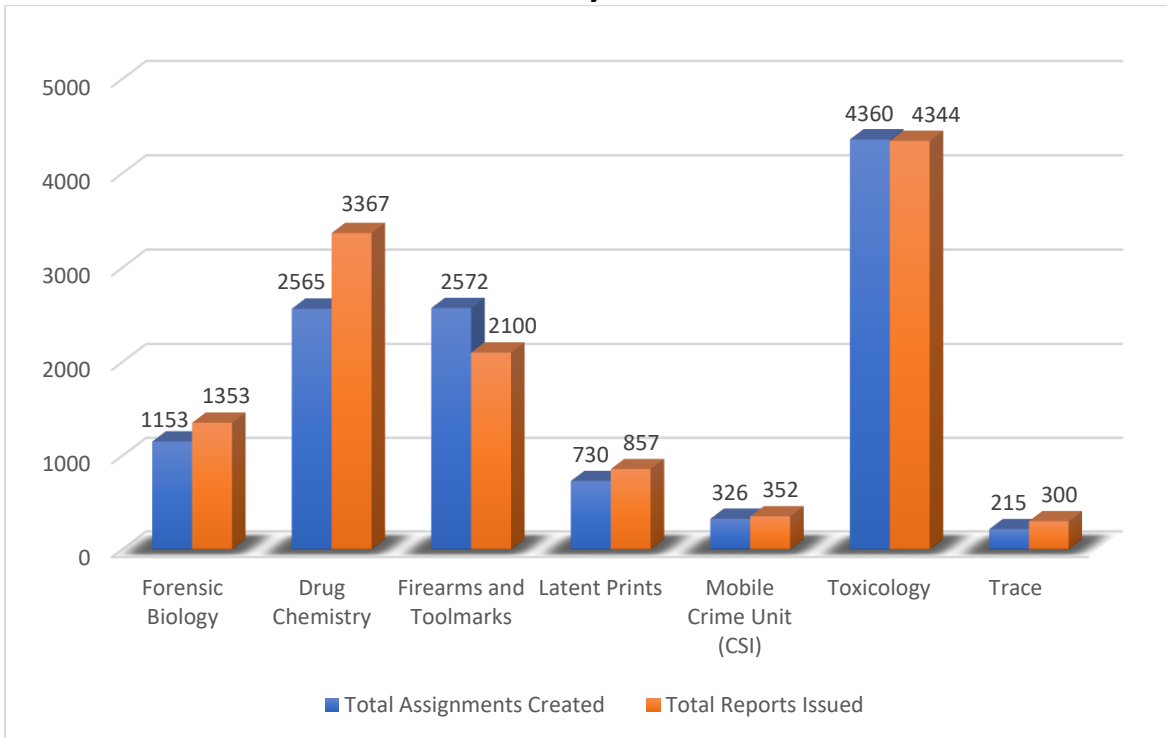
surfaces including wood and metal.

Trace: The Trace Evidence Section examines physical evidence submitted in various types of cases including homicide, sexual assault, burglary, vehicular hit and run, arson, and explosions. Trace evidence includes items such as hair, fibers, paint, fire debris, flammable liquids, primer gunshot residue and explosive materials. Investigative agencies may also request special analyses on a variety of other materials such as soil, adhesives, and plastics.

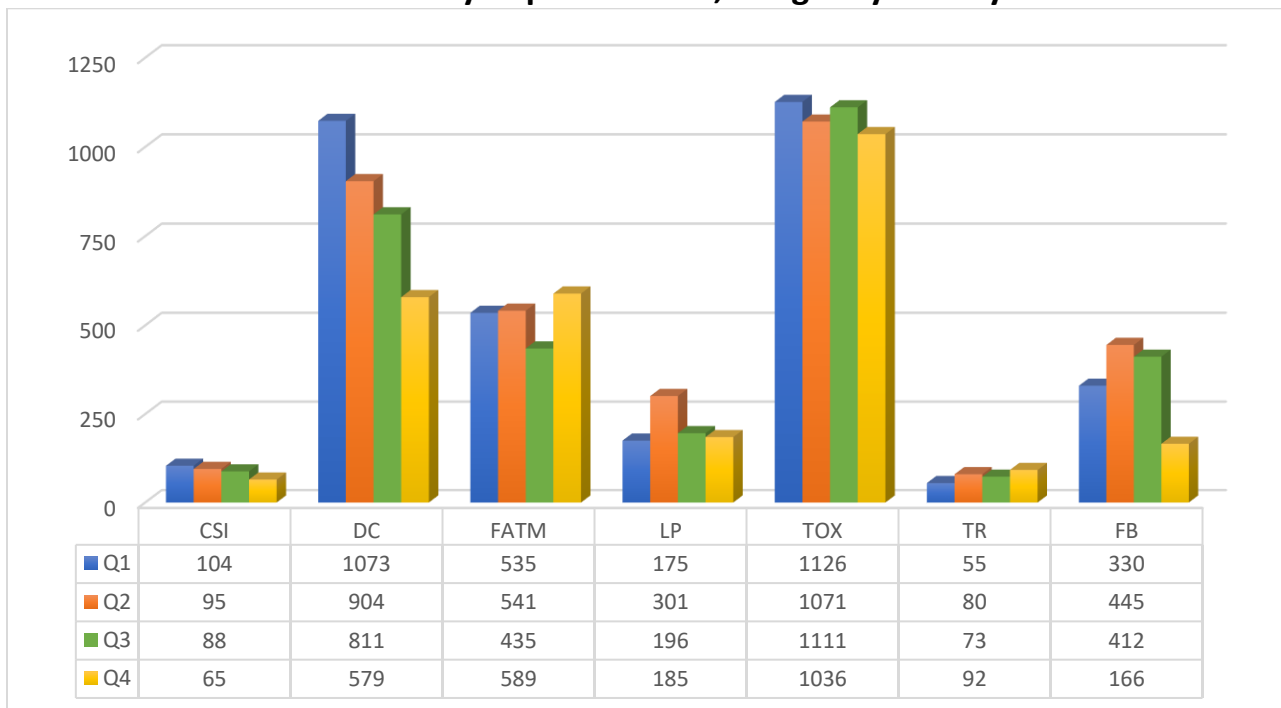
Latent Prints: Latent fingerprint lifts are examined for the presence of latent impressions of value (fingerprints, palm prints, finger joint impressions, footprints). Latent prints of value are then compared to known or inked impressions of a known suspect and examined for specific characterizations for the purpose of identification. The Latent Print Section utilizes the Pennsylvania State Police Automated Fingerprint Identification System (AFIS) and Federal Bureau of Investigations, International Identification System (IAFIS). The Latent Print Section assists the Morgue Operations in the identification of unknown deceased persons.

Mobile Crime Unit: The Mobile Crime Unit provides assistance in processing crime scenes throughout the county when requested. The unit is staffed with experienced scientists and is equipped to properly document scenes as well as properly recover and preserve any physical evidence. The scenes encountered range from homicides to sexual assaults to burglaries. Types of evidence from these varying scenes include, for example, impressions such as tool marks and shoeprints, blood stain patterns, semen, hair, fibers, bullets, and cartridges.

Forensic Laboratory Assignments Created and Reports Completed, Allegheny County 2021

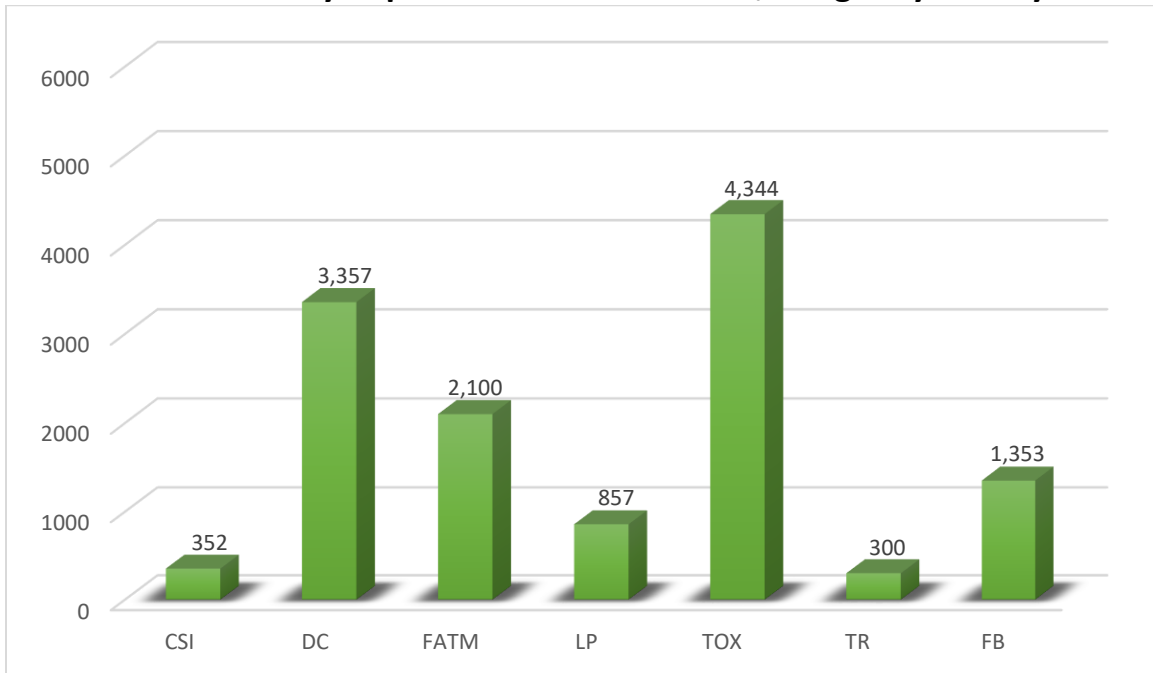


Forensic Laboratory Reports Issued, Allegheny County 2021

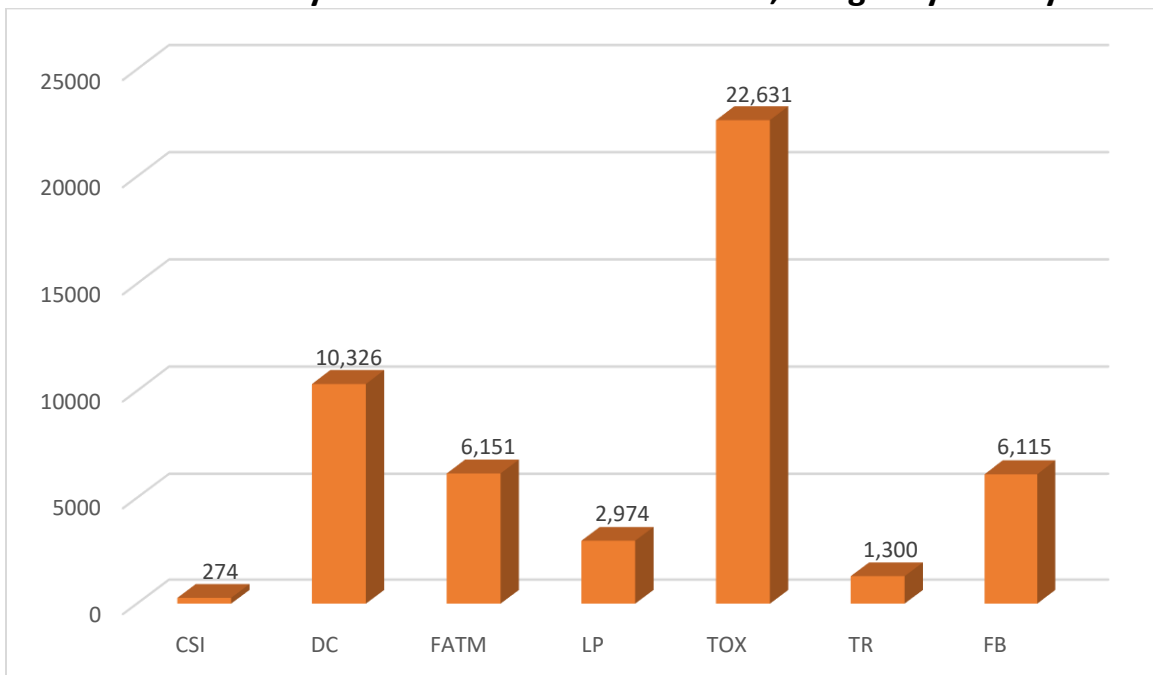


*Not including FB outsourced numbers

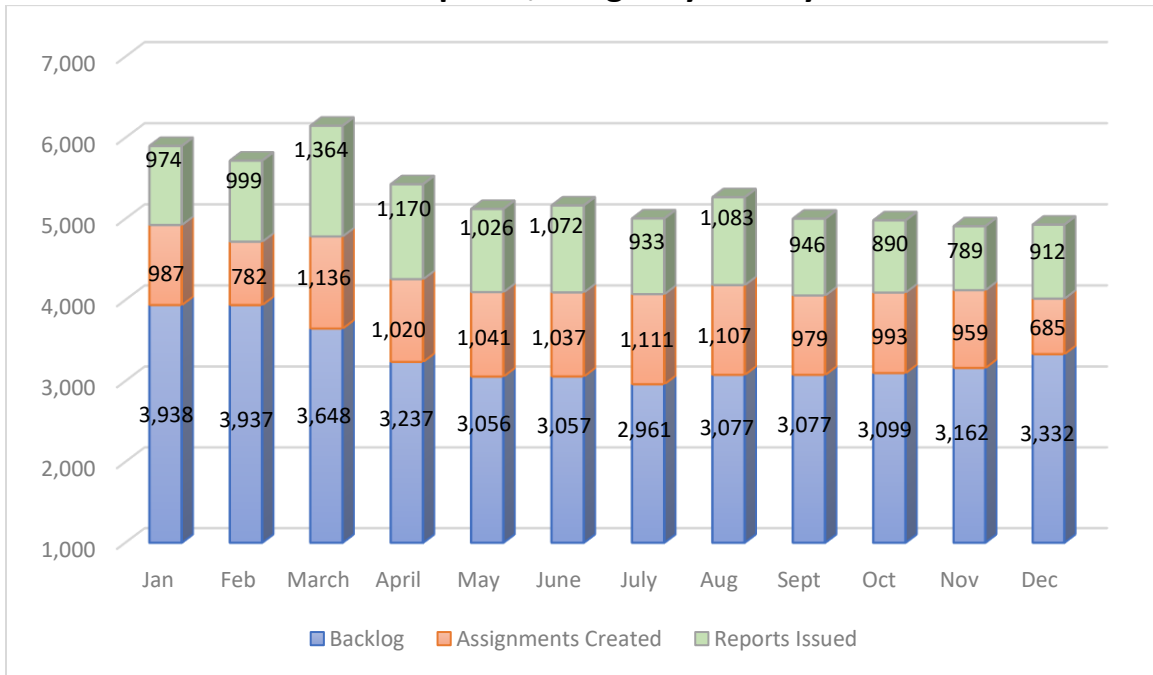
Forensic Laboratory Reports Issued Per Section, Allegheny County 2021



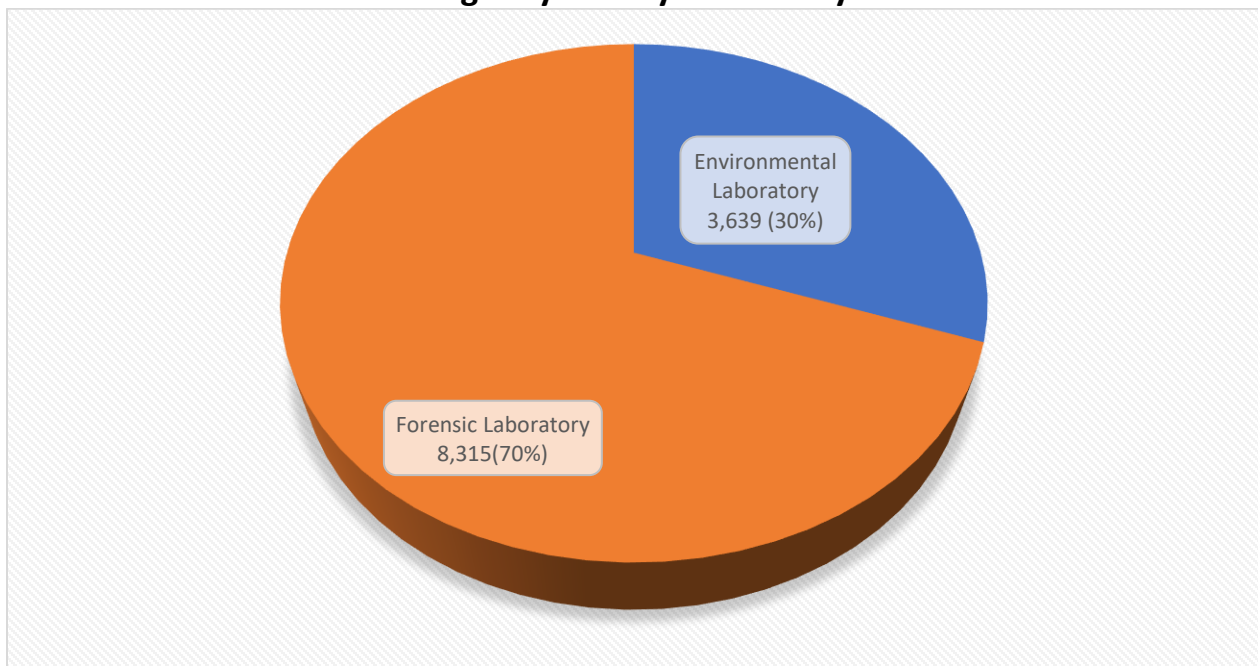
Forensic Laboratory Items Submitted Per Section, Allegheny County 2021



Forensic Laboratory Assignments Backlog, Assignments Created, and Reports Issued Compared, Allegheny County 2021



2021 Allegheny County Laboratory Cases



Environmental Chemistry

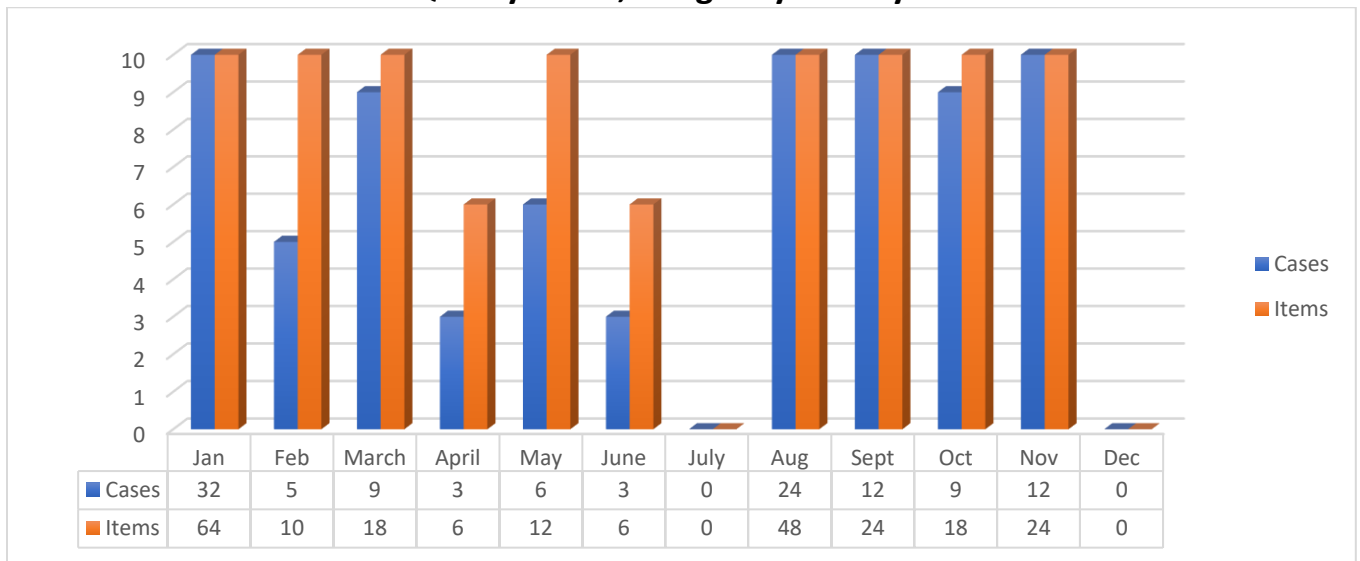
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Air Quality Analysis

BTEX Analysis

Benzene, Toluene, OMP-Xylene (BTEX) is the term used to describe a group of chemicals related to benzene. This includes a variety of compounds: toluene (methyl benzene), ethyl benzene, xylenes and benzene itself. The main sources of BTEX into the environment are the petroleum and chemical industries and other combustion processes. They are also released when natural materials are burned.

BTEX Air Quality Cases, Allegheny County 2021

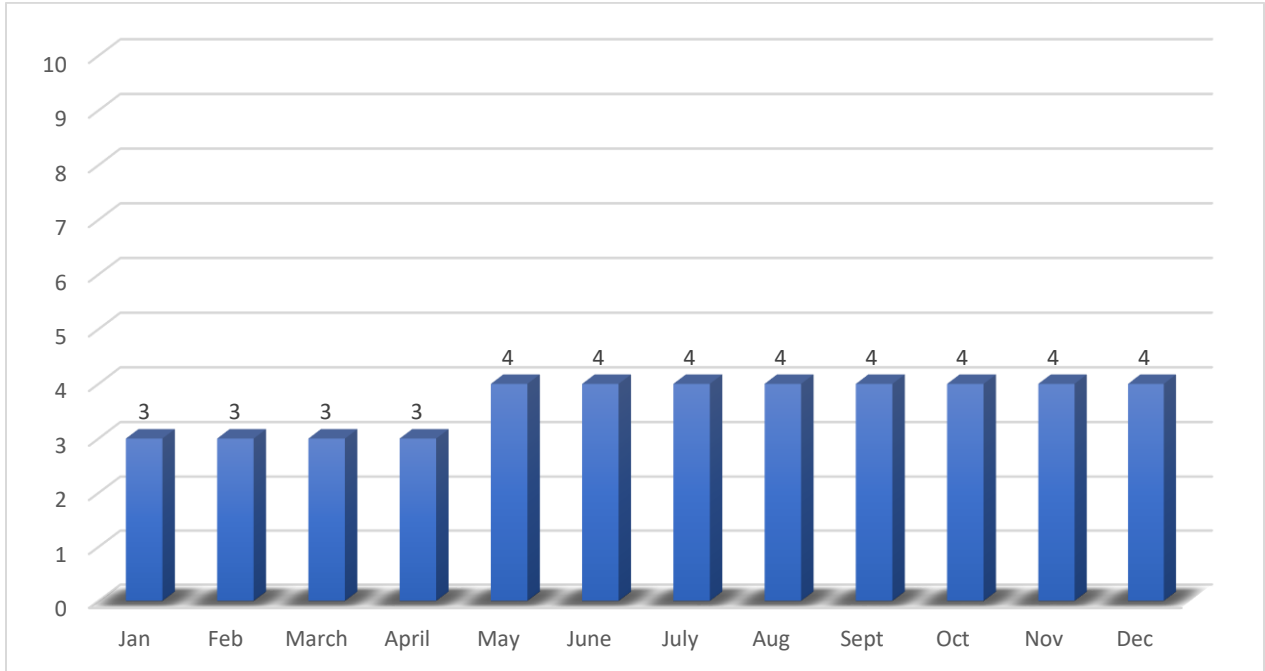


Dust fall Analysis

Dust fall analysis is the gravimetric evaluation of contents (20 microns or less) deposited into a polypropylene collection vessel which is placed into the field for a 30-day time period. This test method has the advantage of extreme simplicity. It is

a crude and non-specific test method, but it is useful in the study of long-term trends.

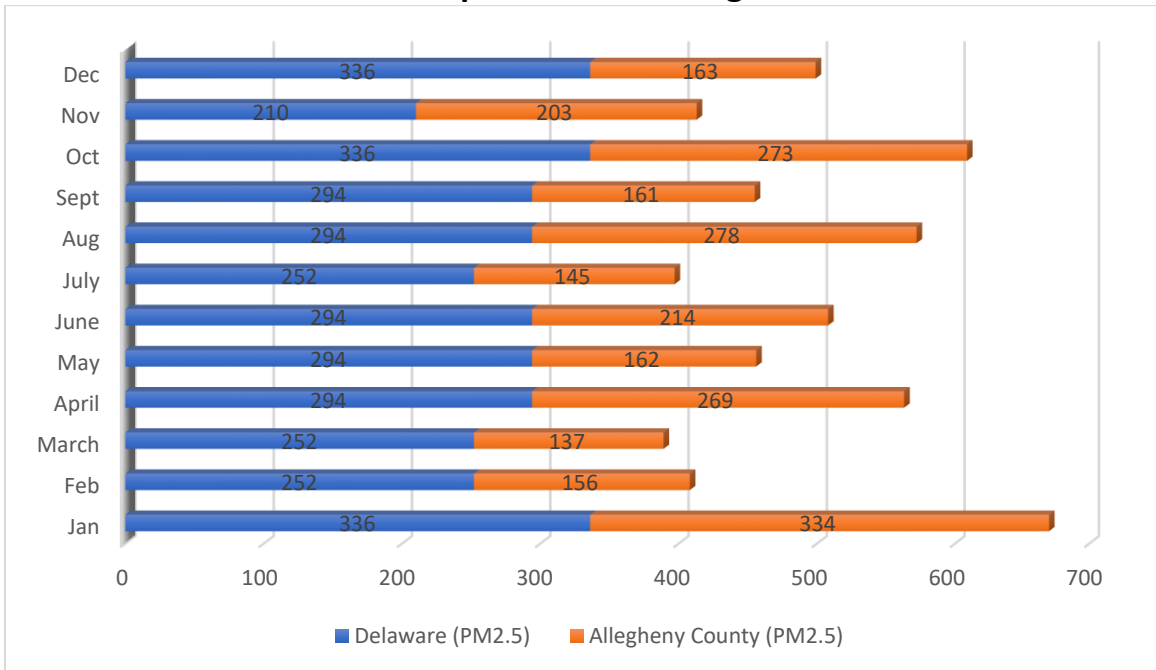
Gravimetric Analysis -Dust Fall Air Quality Cases, Allegheny County 2021



Particulate Matter (PM) 2.5 & PM 10 Gravimetric Analysis

ACOME Environmental Chemistry division also provides air quality analysis in the form of gravimetric analysis. Gravimetric analysis for this air quality analysis is the determination of particulate concentration based on weight difference by weighing the sampling media prior to exposure and post exposure. This is done with two distinct sampling media, PM 2.5 filters and PM 10 filters. PM2.5 filters are used for particulate matter with an aerodynamic diameter less than or equal to 2.5 microns. PM10 filters are used for particulate matter with an aerodynamic diameter less than or equal to 10 microns.

Gravimetric Analysis-PM2.5 Air Quality Cases, Allegheny County and Delaware Tare and Exposed Filters Weighed 2021



Gravimetric Analysis-PM10 Air Quality Cases, Allegheny County Tare and Exposed Filters Weighed 2021

