

# Forensic Pathology & Death Investigation in Arizona

Arizona Society of Pathologists  
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# Overview

- Purpose of it all
- Brief history of death investigation in US
  - Coroner, Medical Examiner, Forensic Pathologist
  - Death investigation systems
- Arizona death investigation
- Statistics – Cause & Manner of Death
- Interaction with LE
- Examples



# Purpose of the Medical Examiner's Office

- Determines cause and manner of death of decedents that fall under jurisdiction of ME
- Types of deaths that require reporting
  - Death when not under current care of a physician
  - Violence
  - Sudden and unexpected
  - Threat to public health
  - Prisoner or in a prison
  - Suspicious, unusual, unnatural
  - Related to occupation
  - Related to medical procedure
  - Unidentified

# Purpose of the Medical Examiner's Office

- Public health
  - Report deaths due to communicable disease
  - Authorize cremation
  - Tissue and organ donation
  - Vital statistics
- Assist families
  - Answer questions
  - Timely death certification for funeral arrangements

# Purpose of the Medical Examiner's Office

- Aid justice system
  - Collect evidence
  - Testify
  - Interpret injury
  - Estimate postmortem interval

# What's The Difference?

- Coroner
- Medical Examiner
- Forensic Pathologist

# Coroner

- Often elected, term limit
- Qualification specified by local law
- May not have any medical background
- Concept from England
- Minimal practical modern use

# Medical Examiner

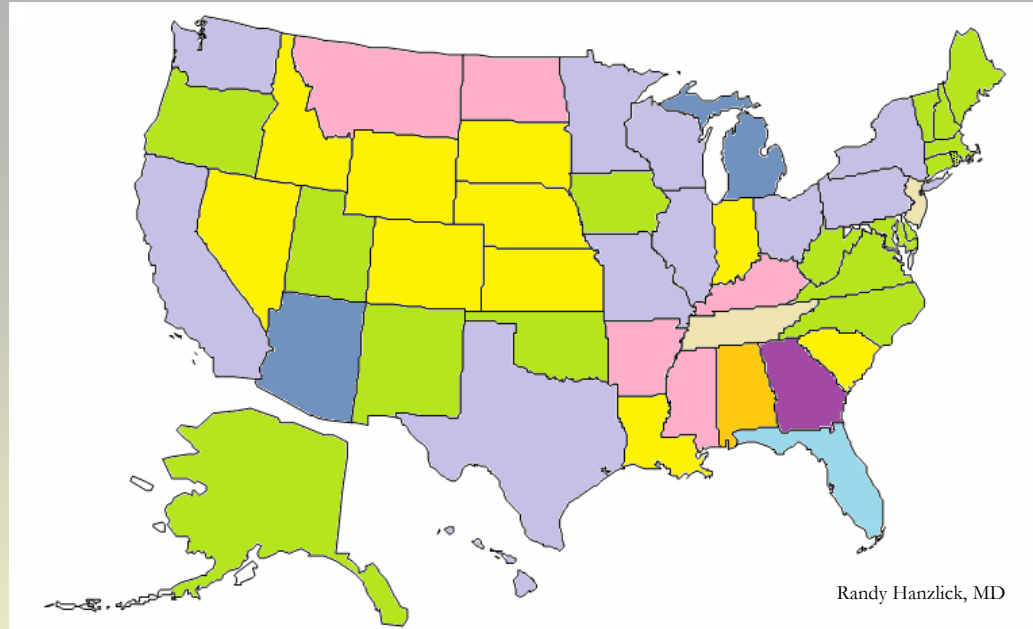
- Often appointed by government without term limit
- Often a physician (can be any kind)
  - May be appointed non-physician
- May not be a Forensic Pathologist



# Forensic Pathologist

- Physician (pathologist)
- Additional training in forensics
- Work in larger population centers
- Criminal case work and testimony

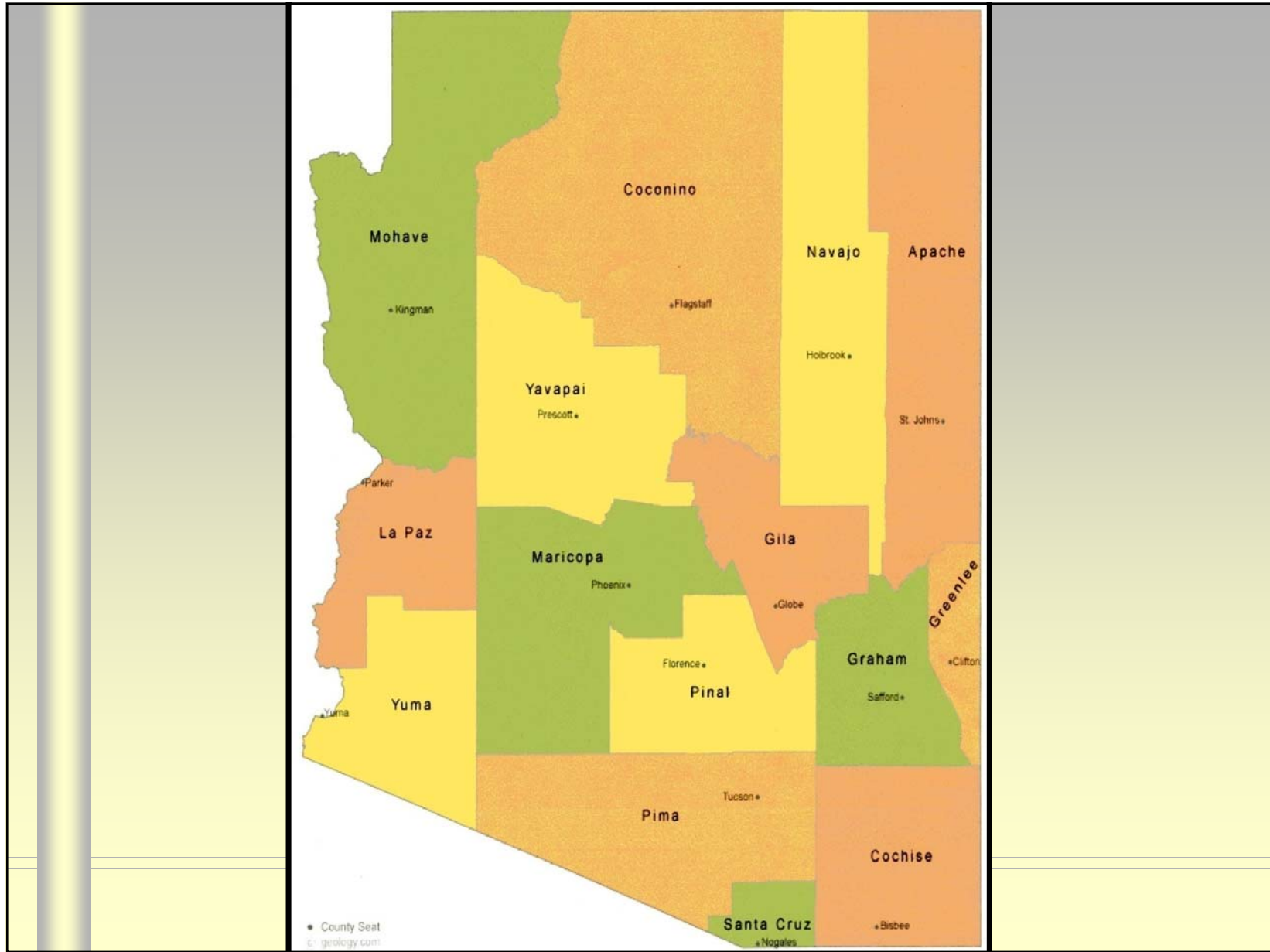
## Death Investigation Systems: 2014



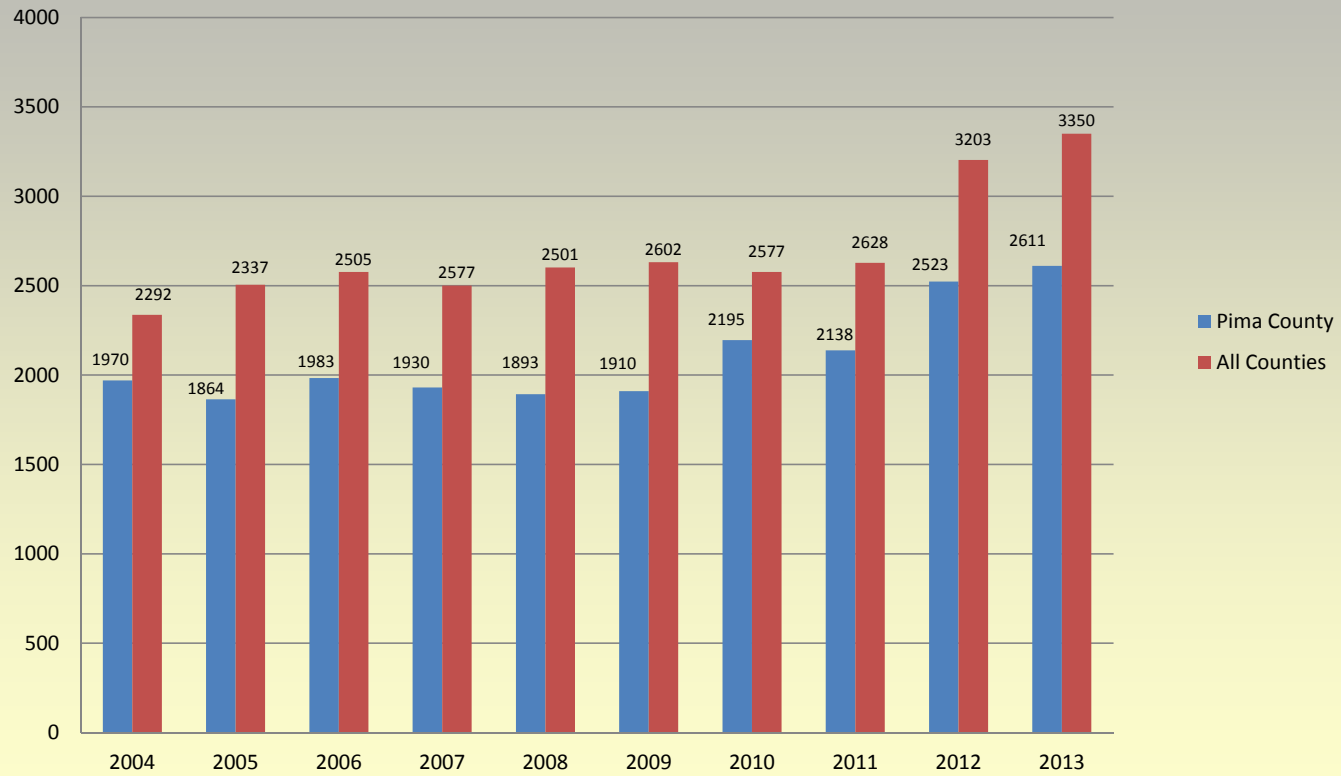
- Some counties have a medical examiner and many or most have a coroner.
- State Medical Examiner with coroners in each county
- State Medical Examiner with various types of non-coroner regional or local assistance
- State Medical Examiner assisting coroners in most counties, at least one autonomous county medical examiner
- District Medical Examiners (FL). ● Mostly state-funded district offices assisting coroners in most counties (AL).
- Medical Examiner (physician) in each county.
- Coroner in each county
- Regional offices administratively (but not operationally) overseen by person with title of State Medical Examiner (NJ, TN)

# Arizona

- 9 Counties in Arizona run a Forensic Pathologist managed death investigation system
- Medical Examiner = Forensic Pathologist
- Alternate Medical Examiner = Non-FP physician
- No coroners in Arizona, only ME's and alternate ME's



# Total Cases 2004 - 2013



# Cause vs Manner of Death

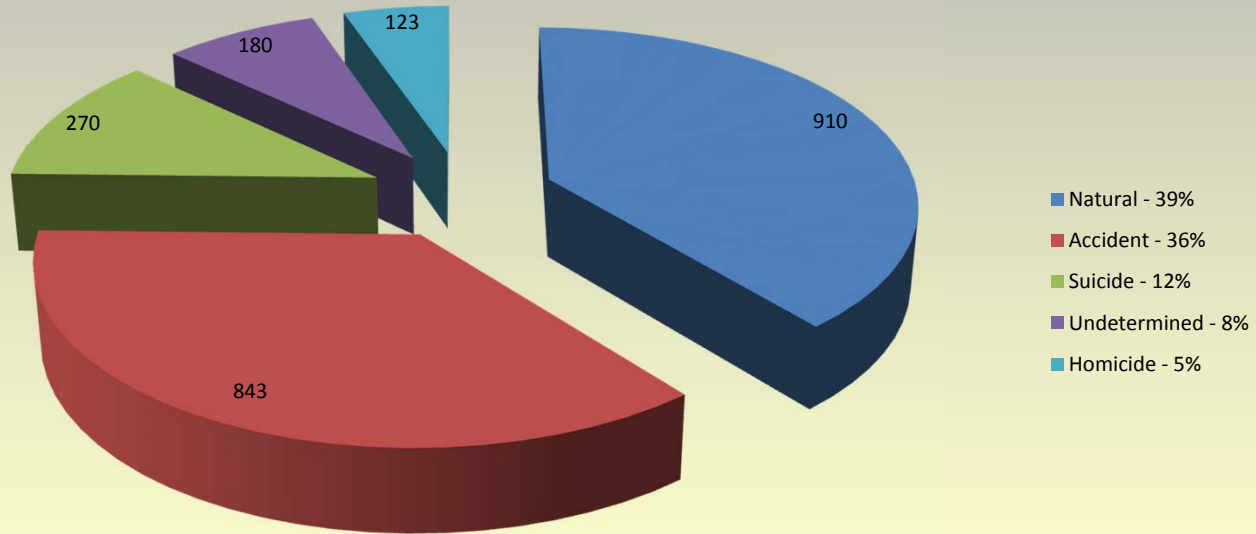
## ■ Cause

- Blunt force injury
- Coronary artery disease
- Diabetes
- Hanging
- Gunshot wound
- Overdose
- Emphysema
- etc

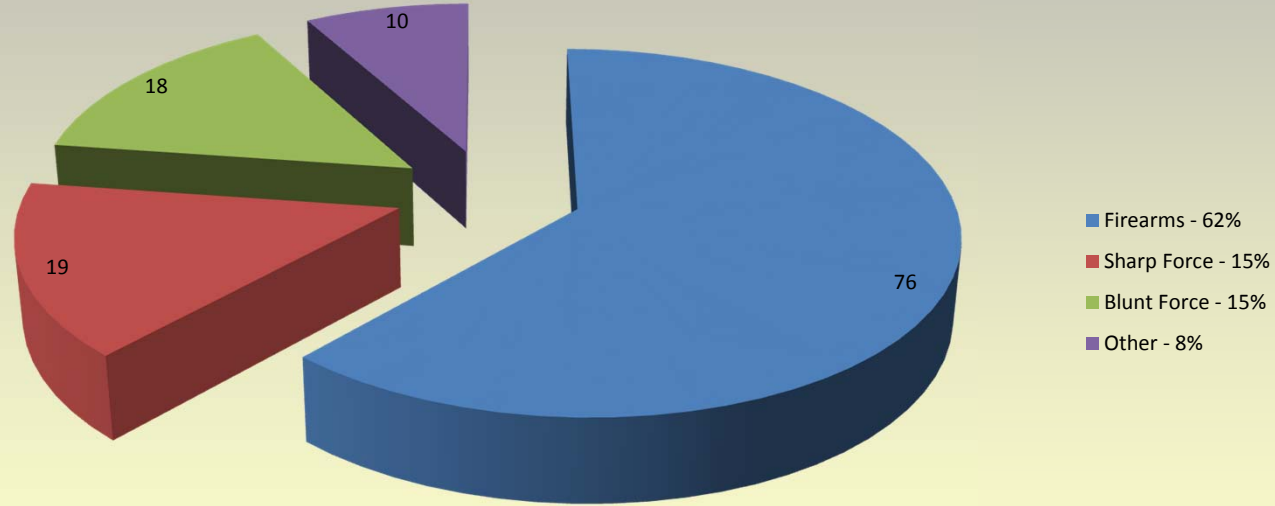
## ■ Manner

- Homicide
- Suicide
- Natural
- Accident
- Undetermined

# MANNER OF DEATH - 2013

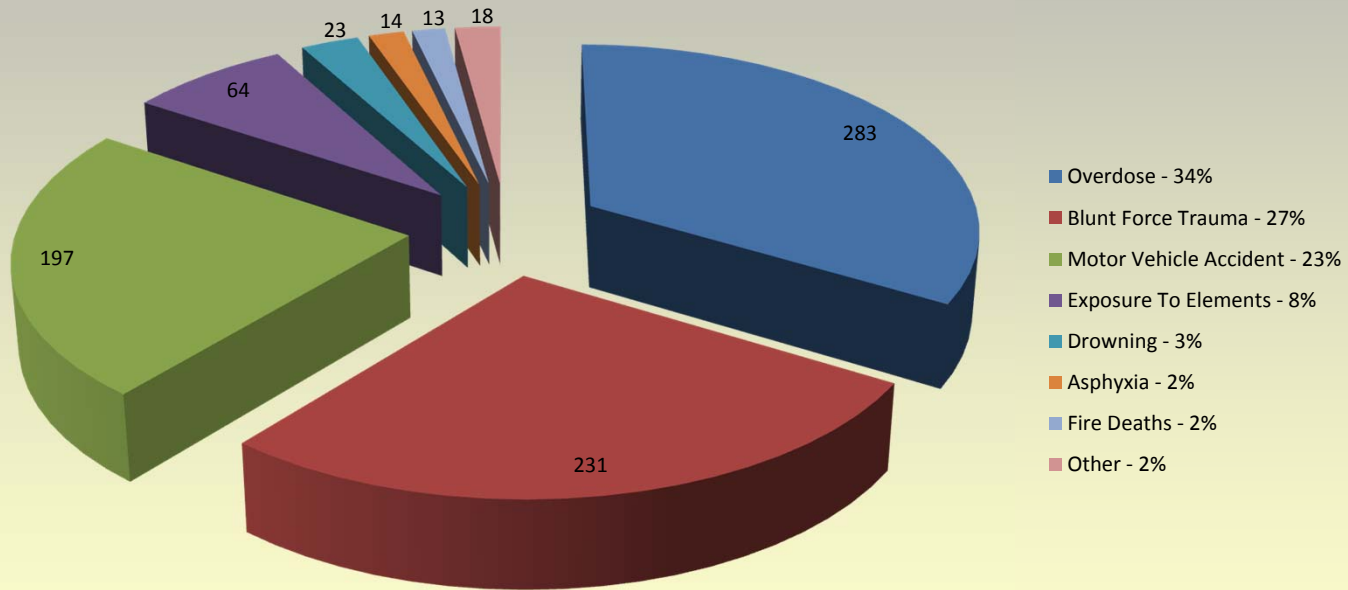


# Homicide by Cause - 2013

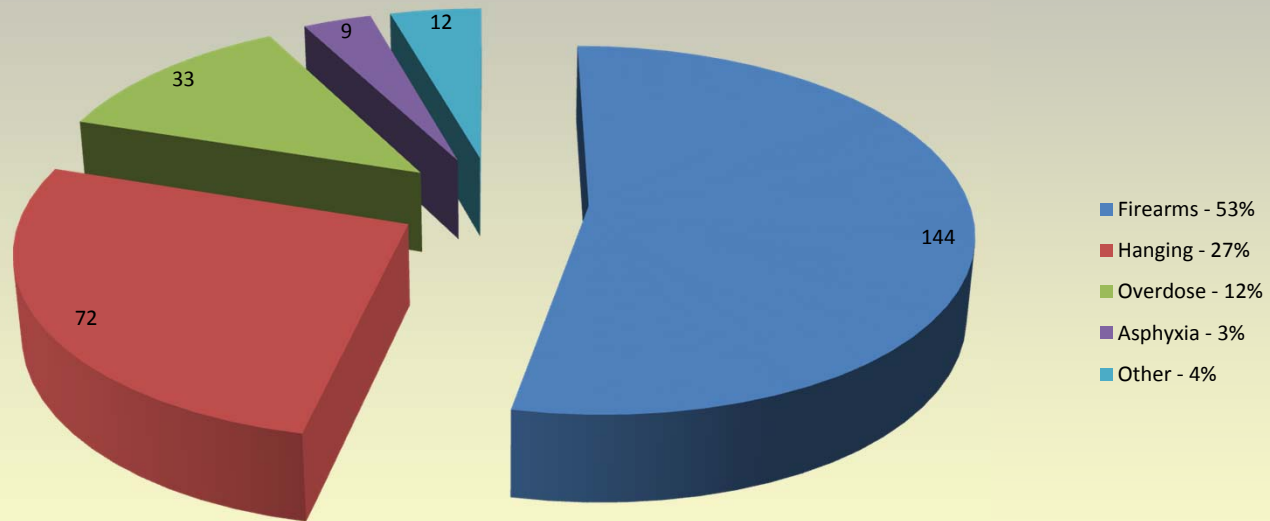




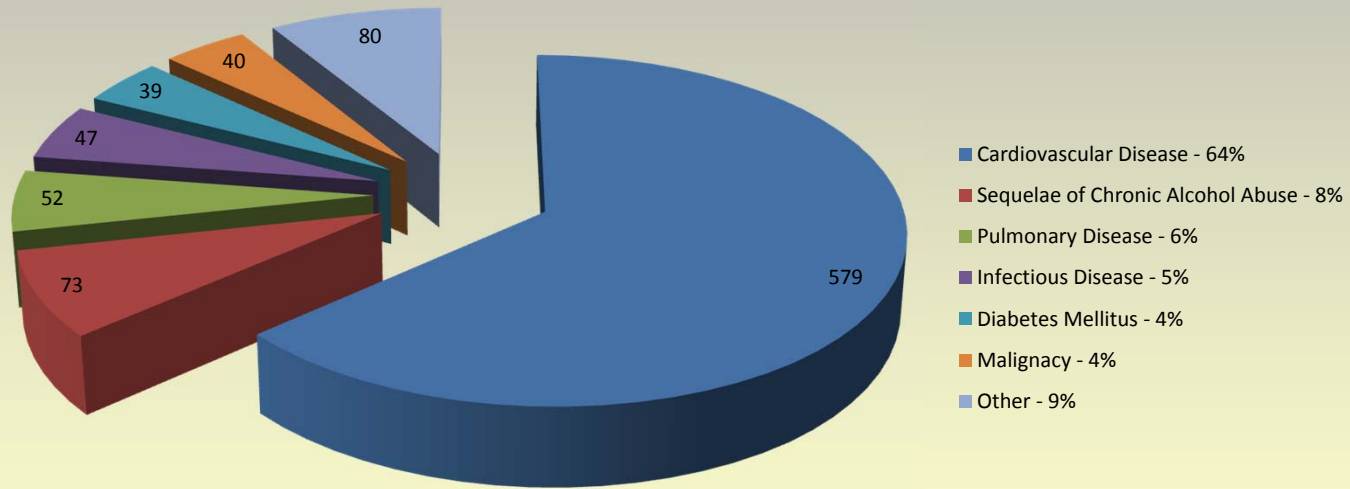
# Accident by Cause - 2013



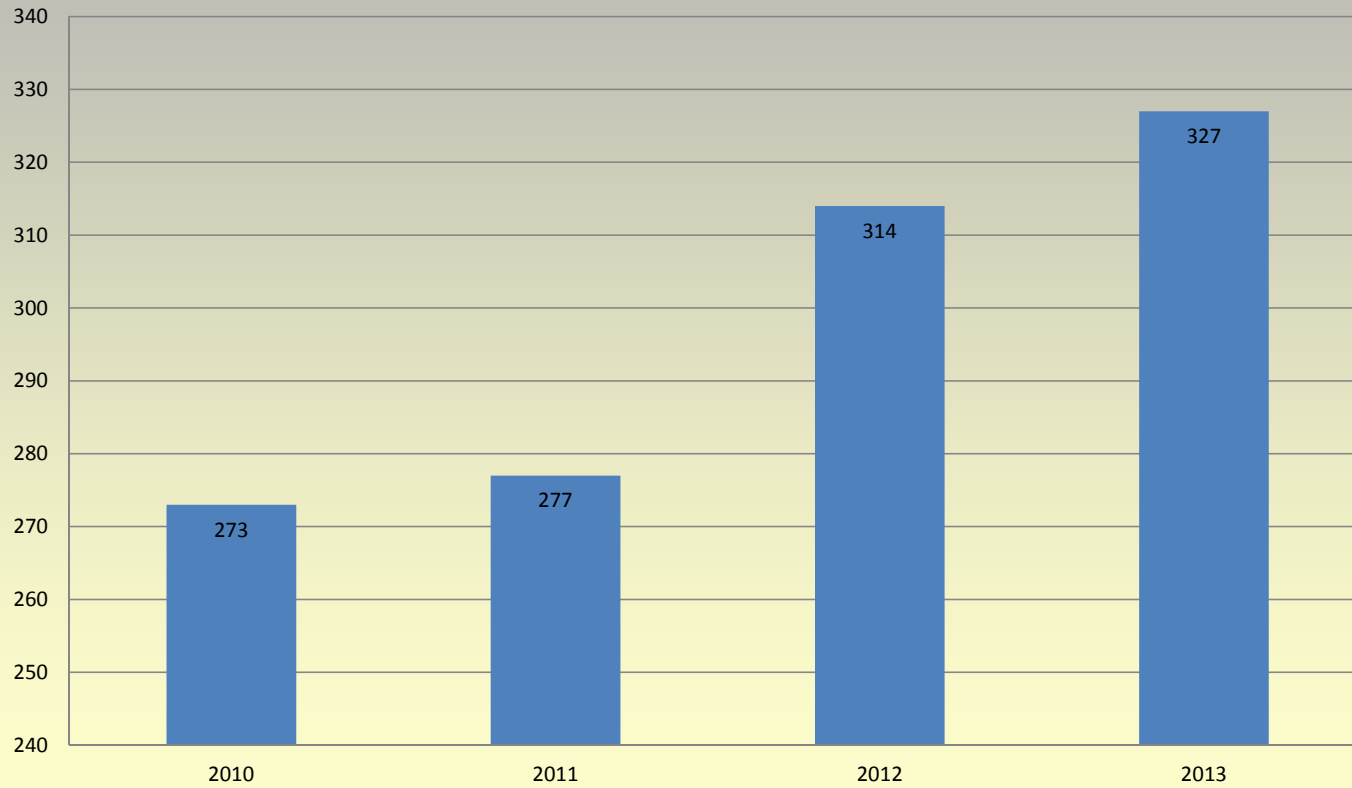
# Suicide by Cause - 2013



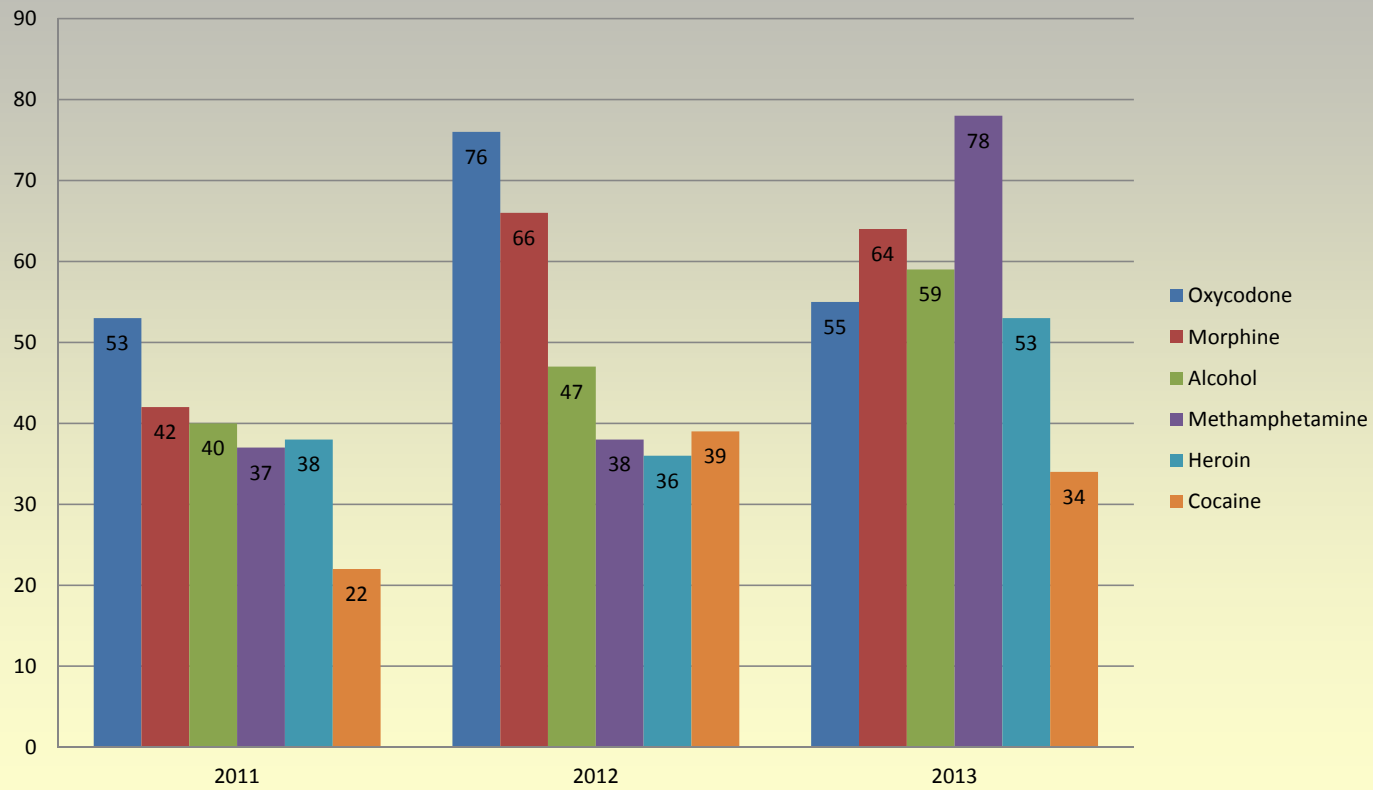
# Natural Deaths by Cause - 2013



# Overdose Deaths 2010 - 2013



# Select Drugs by Year 2011-2013



# ME and the Judicial System

- Frequently consulted in criminal prosecution and civil litigation
- Most criminal investigations involve homicides followed by accidents (MVA)
- Most commonly called to testify by the prosecution as neutral expert witness
- Guilt is determined by the court

# What information we provide

- Estimate postmortem interval
- Document and characterize injury
  - Firearms, Sharp force, Blunt force, Asphyxia, etc
- Presence/absence of natural disease or other conditions
- Survivability
- Distinguish between artifact and injury
- Collect evidence

# Components of Examination

- Review of information
  - Scene, demographic, medical history, comments from law enforcement, families, others
- External Examination
  - Clothing, height, weight, injuries, natural disease, scars, tattoos, medical intervention, evidence collection
- Internal Examination
  - Injuries, natural disease, medical intervention, evidence collection



# Components of Examination

- Toxicology
  - Illicit drugs, prescription medications, poisons
- Radiographs
  - Projectiles, dental examination for ID, hardware
- Histology
  - Infections, cancer, natural disease
- Other
  - Cultures, DNA, special tests

# Postmortem Interval

- Rigor Mortis
- Livor Mortis
- Algor Mortis
- Amount of decomposition
- VERY environmentally dependent
- Last seen alive
- Mail, paper, cell phone, etc

# Postmortem Change Questions

- Are the finding consistent with story “X”?
- Postmortem movement of the body?
- Environment – temperature, air flow, clothing, body habitus, humidity, insect activity, animal scavenging

# GSW Questions

- Range of fire?
  - Contact
  - Intermediate
  - Distant
- Entrance/Exit?
- If multiple injuries which is most serious?
- Same weapon?
- Handgun, shotgun, rifle, etc.?

# Sharp Force Injury Questions

- Stab or incised wound?
- Length of blade?
- Depth of penetration?
- If multiple wounds which is most serious?
- Direction of wound?
- Sharp or blunt edges?
- Consistent with weapon “X”?

# Blunt Force Injury Questions

- Contusion, abrasion or laceration?
- All injuries same age?
- If multiple which is most serious?
- Consistent with being produced by weapon “X”?
- Pattern to injury?

# Natural Death Questions

- Often involve sudden deaths or deaths of individuals who did not see a doctor
  - How did they die?
  - Could I have done something sooner?
  - Does this run in the family?

# CHARGE Syndrome

- Coloboma of the eye
- Heart defects
- Atresia of the choanae
- Retardation of growth or development
- Genital/urinary abnormalities
- Ear abnormalities or deafness