2018 ANNUAL REPORT

Harris County Institute of Forensic Sciences
The MISSION of the Harris County Institute of Forensic Sciences is to provide medical examiner and crime laboratory services of the highest quality in an unbiased manner with uncompromised integrity.
Accreditations

NEW! Lloyd’s Register Quality Assurance ISO 9001:2015 Program (Quality Management)

Accreditation Council for Graduate Medical Education

American Board of Forensic Toxicology

ANSI National Accreditation Board ISO/IEC 17025 Program (Crime Laboratory)

ANSI National Accreditation Board ISO/IEC 17020 Program (Forensic Anthropology)

National Association of Medical Examiners

Texas Forensic Science Commission

Texas Medical Association for Continuing Medical Education

Image: Shau Lin Hon/Slyworks Photography
Medical Examiner Service

Has the statutory duty to determine cause and manner of death
Harris County (HC) remains the third most populous county in the nation, exceeded only by Los Angeles and Cook counties

- **4.6+ million** estimated HC population in 2018*
- **30,135** HC death certificates filed in 2018**
- **35%** (10,577) of HC deaths reported to HCIFS in 2018
- **4,554** medicolegal (ML) cases received by HCIFS for examination
- **5,653** inquest only cases reported
- **370** trauma inquest cases reported
- **2,665** scenes attended by Forensic Investigators

**4,950 deaths were certified in 2018, including:**
- **4,554** Harris County ML cases (all brought to HCIFS for examination)
- **370** trauma inquests
- **26** out-of-county cases

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*Population estimate for 2018 obtained from the US Census Bureau
**Provisional Death Certificate data is from the Texas Department of State Health Services
Statistical Summary

- 86% of ML cases (3,915) received a full autopsy*
  - 14% of ML cases (639) received an external examination only

- 254 decedents unidentified on arrival
  - 0 decedents remained unidentified at the end of 2018**

- 257 referrals to Harris County Bereavement Services

- 228 formal neuropathological consults and 300 unofficial consults***
  - 18 child abuse consults

- No hospital autopsies retained

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* Partial autopsies are not performed by the HCIFS.
** Excludes skeletal cases and incomplete remains
*** Unofficial consults include gross, photo, and microscopic consults.
Total Caseload (2015 - 2018)

- **Total ML Cases**
  - 2015: 4,644
  - 2016: 4,870
  - 2017: 4,731
  - 2018: 4,554

- **Autopsies**
  - 2015: 4,870
  - 2016: 4,015
  - 2017: 3,923
  - 2018: 3,915

- **Externals**
  - 2015: 3,939
  - 2016: 855
  - 2017: 810
  - 2018: 639
Monthly ML Caseload 2018

- December: 383 cases
- November: 372 cases
- October: 380 cases
- September: 374 cases
- August: 376 cases
- July: 373 cases
- June: 384 cases
- May: 376 cases
- April: 348 cases
- March: 374 cases
- February: 380 cases
- January: 435 cases

Cases Received per Month
### Average Daily Medicolegal Caseload

**2018**
- **12.5 cases**

**2017**
- **13.0 cases**

**2016**
- **13.4 cases**

**Months with HIGHEST Average Daily Caseload:**
- 2018 January: 14.0 cases
- 2017 December: 14.0 cases
- 2016 July: 15.2 cases

**Months with LOWEST Average Daily Caseload:**
- 2018 April: 11.6 cases
- 2017 September: 11.6 cases
- 2016 October: 11.8 cases
Trauma inquest is a death investigation in which the medical examiner accepts jurisdiction and completes the death certificate, but the body of the deceased is not examined by medical examiner personnel. Prior to 2014, many of the deaths that we currently handle as trauma inquests were brought in for external examination. The practice of performing a trauma inquest in these cases is a more judicious use of HCIFS personnel, and streamlines family disposition of the body, without compromising the accuracy of death certification.

* About a 12% increase compared with 2017; a record high for trauma inquest cases
Manner of Death – Autopsy and External Examinations

N=4,554

- Natural: 1,886
- Accident: 1,551
- Suicide: 512
- Homicide: 431
- Undetermined: 167
- Fetal: 7

11%

10%

4%

<1%

34%

41%
Manner of Death by Autopsy and External Examinations

**Autopsy Examinations**
- Natural: 1,616 (41%)
- Accident: 1,200 (31%)
- Suicide: 498 (13%)
- Undetermined: 164 (4%)
- Fetal: 6 (1%)
- Other: 12 (3%)
- Undetermined: 12 (3%)
- Fetal: 1 (1%)

**External Examinations**
- Natural: 270 (42%)
- Accident: 351 (55%)
- Suicide: 14 (2%)
- Undetermined: 6 (1%)
- Fetal: 1 (1%)
- Homicide: 431 (67%)

N=3,915

N=639
Manner of Death by Sex

N=4,552

*Undetermined category composed of cases with Undetermined manner (166) and fetal manner (6)

Sex is unknown in 2 fetus cases
Race/Ethnicity of ML cases

- White: 2,002 (44%)
- Black: 1,307 (29%)
- Hispanic: 1,064 (23%)
- Other: 175* (4%)

N=4,548

* Other is composed of Native American (3) and Asian (172)

Race/Ethnicity is unknown in 6 cases.
Race/Ethnicity Case Demographics Compared to Population

HCIFS Decedent Population*

- White: 44%
- Black: 29%
- Hispanic: 23%
- Other: 4%

Houston Population**

- White: 44%
- Black: 23%
- Hispanic: 8%
- Other: 9%

Harris County Population***

- White: 41%
- Black: 31%
- Hispanic: 19%
- Other: 9%

* HCIFS decedent population, $N=4,546$, excludes unknown race/ethnicity
** City of Houston population, $N=2,325,502$, estimated by U.S. Census Bureau as of July 1, 2018
*** Harris County population, $N=4,698,619$ estimated by Texas DSHS Center for Health Statistics
ML Cases by Manner and Race/Ethnicity

N=4,548

Excludes 6 individuals of unknown race/ethnicity

White: 2,002
Black: 1,307
Hispanic: 1,064
Other: 175
ML Cases by Age

- <1 Year: 119
- 1-17 Years: 160
- 18-39 Years: 1,155
- 40-64 Years: 2,075
- 65+ Years: 1,045

N=4,554
Homicide Cases

*About a 5% decrease compared with 2017; a 21% increase compared with 2011*
Homicides by Injury Zip
Homicides by Injury Zip/Commissioner Precinct Boundary
Homicides by Injury Zip/Constable Precinct Boundary
26 cases were linked to at least one other ML case (e.g. double murder, murder suicide, etc.)

At least 47 homicide cases are associated with domestic violence

11 homicide deaths occurred while at work

Cases with multiple causes of death include blunt-/sharp-force trauma (3)

* Other causes include the use of drugs, thermal injuries, homicidal violence, and drowning
Homicide Deaths by Firearms

![Bar chart showing Homicide Deaths by Firearms from 2016 to 2018. The chart displays the number of deaths due to multiple firearm wounds and single firearm wounds for each year.]

- **2016**: 181 multiple, 191 single
- **2017**: 158 multiple, 202 single
- **2018**: 153 multiple, 183 single

Homicide Deaths by Demographics

**Sex**
- Male: 352 (82%)
- Female: 79 (18%)

**Race/Ethnicity**
- Black: 207 (48%)
- Hispanic: 148 (34%)
- White: 62 (15%)
- Asian: 14 (3%)

Total: N=431
Homicide Deaths by Race/Ethnicity – Harris County & City of Houston

City of Houston

- Black: 35%
- Hispanic: 4%
- White: 9%
- Asian: 35%

N=333*

Harris County

Excluding the City of Houston

- Black: 34%
- Hispanic: 30%
- White: 1%
- Asian: 35%

N=98

* 333 homicide cases were attributed to injury locations within the City of Houston based on the address of the place of injury and law enforcement jurisdiction.
Homicide Deaths by Age

N=431

- < 18 years: 47
- 18-39 years: 257
- 40-64 years: 107
- 65+ years: 20

- 59% 25%
- 11% 5%
Homicide Deaths of Infants and Toddlers (Aged 0 - 4)

---|---|---|---|---|---|---|---|---|---|---|---
2008 | 22 | 30 | 29 | 26 | 27 | 24 | 18 | 16 | 14 | 11 | 18
2009 | 22 | 30 | 29 | 26 | 27 | 24 | 18 | 16 | 14 | 11 | 18
ML Accidental Cases

*About an 8% decrease compared with 2017; a 9% increase compared with 2010*
Demographics of ML Accidental Deaths

**Sex**
- Male: 1,140 (74%)
- Female: 411 (26%)

**Race/Ethnicity**
- White: 725 (47%)
- Black: 380 (24%)
- Hispanic: 396 (26%)
- Asian: 50 (3%)

N = 1,551
ML Accidental Deaths by Age

- < 18 years: 65
- 18-39 years: 485
- 40-64 years: 658
- 65+ years: 343

N=1,551
Most Common Causes of ML Accidental Deaths

N=1,551

- Motor Vehicle: 466
- Drug Toxicity: 616
- Non-MVA Blunt Trauma: 255
- Drowning: 62
- Asphyxia: 23
- Fire/Thermal: 24
- Other: 105*

* Other includes firearm injuries, sharp force injuries, hyperthermia, hypothermia, and therapeutic complications.
Motor Vehicle Accident (MVA) Death Cases

- MVA fatalities include 30 children aged 2 days to 17 years
- 4 children were pedestrians, aged 2 years to 13 years of age
- 20% of driver fatalities (50) were under 25 years of age
- 25 stranded motorists were hit while stopped

N=466

- Driver: 247
- Passenger or Unknown Position: 101
- Pedestrian: 118
MVA Sex and Age Distributions

Driver Sex Distribution
- 19% Male
- 81% Female
- N=247
  - Male: 201
  - Female: 46

Sex Distribution all MVA
- 23% Male
- 77% Female
- N=466
  - Male: 360
  - Female: 106

The youngest driver fatality was 15; the oldest 92

Proportion of drivers who were teens or senior citizens
- 18% 16 to 25 years
- 20% 65+ years
- 62% Other Ages
- N=247
  - 16 to 25 years: 50
  - 65+ years: 45
  - Other Ages: 152
Accidental Drowning

- 62 total cases of accidental drowning in 2018

- Age range is 19 months to 72 years
  - Includes 13 children aged 2 to 7 years

  - 45 of the drowning cases are males compared to 17 females
Accidental Drowning

Race/Ethnicity

- White: 26
- Black: 18
- Hispanic: 15
- Asian: 3

Types of Water

- Residential Pool: 25
- Natural Water*: 11
- Lake/Pond: 9
- Community Pool: 8
- Bathtub: 3
- Other**: 6

N=62

* Natural Water category includes death locations such as bayou, creek, river, beach and ship channel.
** Other category includes death locations such as near a roadway, parking lot or other open area, and ditch.
ML Suicide Cases

*About a 2% decrease compared with 2017; a 16% increase compared with 2011*
ML Suicide Case Demographics

- Male to female ratio is **4.12 to 1**
  - A record high male to female ratio

- Age range is **11 to 91** years

- The majority (**57%**) of suicide cases occur among white individuals

- Number of companion Suicide/Homicide cases:
  - 2015: 15
  - 2016: 11
  - 2017: 17
  - 2018: 14
Causes of Death in ML Suicides

- 56% Firearm: 290
- 26% Hanging: 131
- 9% Toxicity: 47
- 6% Blunt Force Trauma: 29
- 3% Other: 15*

*Other category contains: Asphyxiation-not due to hanging (3), Sharp Force (7), Thermal (2) and Drowning (3)
Suicide Deaths by Demographics

Sex

- Male: 412 (80%)
- Female: 100 (20%)

Race/Ethnicity

- White: 232 (52%)
- Hispanic: 122 (27%)
- Black: 60 (13%)
- Asian: 36 (8%)

N=512
Most Frequent Substances Listed in Cause of Death for ML Cases

This data does not reflect discrete cases because drugs may be combined within a case.
Opiates/Opioids Listed in Cause of Death for ML Cases

- **N=321**
  - **Heroin**: 173
  - **Fentanyl and Analogs**: 97
  - **Hydrocodone**: 60
  - **Oxycodone**: 23
  - **Methadone**: 20
  - **Morphine**: 17
  - **Codeine**: 16

This data does not reflect discrete cases because drugs may be combined within a case.
Hydrocodone, Heroin, and Fentanyl in Cause of Death for ML Cases

Deaths

Year

Hydrocodone, Heroin, and Fentanyl in Cause of Death for ML Cases


Hydrocodone
Heroin
Fentanyl and Analogs

Deaths

0 50 100 150 200 250

Manner of Death in Children (Aged 0 - 17 Years)

- Accident: 65 (23%)
- Undetermined: 81 (31%)
- Natural: 51 (17%)
- Homicide: 46 (8%)
- Suicide: 21 (29%)

N=264
Top Causes of Death in Children (Aged 0 - 17 Years)

- Firearm wounds: 36
- MVA: 30
- Blunt force injury, not MVA: 19
- Drowning: 17
- Hanging: 11
- Asphyxia, not due to hanging: 7

N=120
Toddler Deaths (Aged 1 - 4 Years)

- Injury Deaths Include:
  - 3 toddlers died in MVA as passengers
  - 10 toddlers drowned in accidents
  - 10 Homicide cases
    - 6 males
    - 4 females

N=47

- Accident: 22
- Natural: 10
- Homicide: 10
- Undetermined: 5
Infant/Fetal Deaths

The birth count for Harris County is estimated to be 71,944 for 2018
(Data provided by Texas Department of State Health Services)

- **119** infant/fetal death cases
  (aged less than 1 year)

- **72** cases of undetermined manner
  - **39** were classified as undetermined (co-sleeping)*

- The cause of death in **13** of the **23** infant deaths with a natural manner was SIDS.

* “Undetermined (co-sleeping)” are cases with no anatomic findings to indicate a cause of death, toxicological cause of death, or suspicion of foul play but infants were co-sleeping with another individual at the time of their death. These cases would otherwise be classified as Sudden Infant Death Syndrome (SIDS) but for the possibility of smothering. Therefore, the cause of death in this subset of cases was classified as “undetermined (co-sleeping).”
While at Work Deaths

<table>
<thead>
<tr>
<th>Year</th>
<th>Non-Natural</th>
<th>Natural</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>2016</td>
<td>78</td>
<td>70</td>
<td>156</td>
</tr>
<tr>
<td>2017</td>
<td>72</td>
<td>69</td>
<td>142</td>
</tr>
<tr>
<td>2018</td>
<td>66</td>
<td></td>
<td>135</td>
</tr>
</tbody>
</table>
**Death During Police Intervention***

* These include deaths in which the circumstances of the death place the decedent in either direct or indirect contact with law enforcement such as incarceration, apprehension, and pursuit. This category of death is not limited to police shootings, arrest-related deaths, apprehension deaths, or in-custody deaths.

![Bar Chart](chart.png)

- **Suicide**: 30
- **Homicide**: 28
- **Accident**: 26
- **Natural**: 14
- **Undetermined**: 3

N=101
Most Frequent Causes of Natural Death

1,886 Natural Deaths in 2018

- Hypertensive Cardiovascular Disease
- Atherosclerotic Cardiovascular Disease
- Diabetes Mellitus
- Obesity
- Chronic Ethanolism
- Chronic Obstructive Pulmonary Disease
- Other forms of cardiac death

This data does not reflect discrete cases because diseases may be combined within a case.
BMI was calculated for 4,121 decedents aged 13 years or older, at least 60” tall who weighed at least 100 pounds:

- **1,281** (31%) were obese with a BMI of 30 or greater
- **1,185** (29%) were overweight with a BMI between 25 and 29
- The greatest BMI was **83** (598 lbs./71” tall)
- **27** decedents weighed more than 400 lbs.
- **1,655** (40%) decedents were of normal weight or underweight
For **323** decedents, diabetes mellitus was listed as the primary cause (**67**) or the contributing cause (**256**) of death

- **72%** were either overweight or obese *Body Mass Index (BMI) = 25*
● HCIFS maintains agreements with:
  ● LifeGift
  ● Lions Eye Bank of Texas at Baylor College of Medicine
  ● Biograft Transplant Services

● 337 decedents donated organs and/or tissue in 2018.
Forensic Anthropology

- Staffed by three doctoral-level forensic anthropologists, two of whom are certified as Diplomates by the American Board of Forensic Anthropology

- 2018 case work:
  - 264 total cases received with written reports provided
  - 168 autopsy consultations without written reports
  - 24 death scenes with skeletal recovery
  - 37 cases of remains determined to be non-human
Forensic Entomology

- Staffed by a board-certified, doctoral-level Forensic Entomologist
  - Reports are peer-reviewed by external doctoral-level entomologists from three major academic institutions

- 2018 Casework:
  - 54 Cases
  - 27 Scene Collections
  - 13 Autopsy Collections
  - 3 Scene and Autopsy Collections
Forensic Entomology by Manner of Death

<table>
<thead>
<tr>
<th>Manner of Death</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Natural</td>
<td>29</td>
<td>30</td>
<td>35</td>
<td>32</td>
</tr>
<tr>
<td>Undetermined</td>
<td>12</td>
<td>7</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td>Homicide</td>
<td>13</td>
<td>5</td>
<td>8</td>
<td>12</td>
</tr>
<tr>
<td>Accident</td>
<td>8</td>
<td>9</td>
<td>7</td>
<td>3</td>
</tr>
<tr>
<td>Suicide</td>
<td>7</td>
<td>6</td>
<td>6</td>
<td>2</td>
</tr>
</tbody>
</table>
Quality Management Division

A separate division of HCIFS

Ensures that services provided by the Institute are reliable and of high quality
Responsibilities

- Maintains a **documented quality management system** that meets all accreditation and county requirements

- Facilitates **quality improvements** within each division of HCIFS

- Monitors the **continued use of best practices** and ensures the reliability of records released for discovery
2018 Accomplishments

- 559 standard operating procedures reviewed
- 187 proficiency tests administered
- 401 court orders processed
- 14 internal audits conducted
- 110 internal training sessions provided

Image: Shau Lin Hon/Slyworks Photography
Crime Laboratory Service

Provides analytical testing services to the HCIFS Medical Examiner Service, the justice system, and law enforcement agencies in Harris and surrounding counties.
Statistical Summary

- Cases received: 22,537
- Cases completed: 22,743
- Total Number of submitting agencies: 74
- 70% of laboratory personnel have a professional certification
  - American Board of Criminalistics: 53 analysts
  - American Board of Forensic Toxicology: 16 analysts
  - Association of Firearm and Tool Mark Examiners: 4
Crime Laboratory Service:
Drug Chemistry

Analyzes suspected drug evidence seized by law enforcement agencies
Drug Chemistry Laboratory

In accordance with Texas state statutes, identifies confiscated, illegal, and dangerous drugs, including:

- Plant material
- Powders, tablets, liquids
- Drug paraphernalia

The laboratory also develops and implements methods to identify new “designer” drugs including:

- Stimulants known as “Bath Salts”
- Synthetic cannabinoids such as “Spice” or “K2”
- NBOMe hallucinogens
Drug Cases Received and Completed

* Compared to 2017, a 5% decrease in cases received because of changes in law enforcement practices
Positive Test Results

N=14,150

- Non-Controlled Substances: 3,854
- Marihuana/THC: 2,923
- Methamphetamine: 2,067
- Prescription Drugs: 1,703
- Cocaine: 1,529
- Designer Drugs: 977
- Opioids: 914
- Other Controlled Substances: 183

*“Other” relates to a variety of controlled substances not specifically listed as an individual result in the pie chart*
Breakdown of Designer Drug Test Results

N=977

- Synthetic Marihuana: 578
- Bath Salts: 331
- NBOMe: 24
- Other: 44

This data does not reflect discrete cases because drugs may be combined within a case.
Designer Drug Trends

Number of Test Results

Year

2013 2014 2015 2016 2017 2018

155 267 297 279 266 331

355 776 947 798 407 578

Bath Salts (Synthetic Cathinones)
K2/Spice (Synthetic Cannabinoids)
NBOMe Hallucinogens

These data do not reflect discrete cases because drugs may be combined within a case.
Crime Laboratory Service:

Forensic Genetics

Analyzes biological fluids and tissues such as blood, semen, muscle, and bone
Forensic Genetics Laboratory

Conducts DNA testing primarily for:

- Law enforcement agencies
- HCIFS medical examiners and forensic anthropologists assist in positively identifying decedents.
- Cases submitted for DNA testing include crimes against persons such as sexual assault, homicide, and robbery, as well as property crimes such as burglary and theft.
- Crimes against persons are given first priority for testing.
The laboratory paused the collection and analysis of touch DNA property crimes in July 2015 to focus on crimes against persons, which typically require more testing and more complex interpretations.

Increasing DNA testing of crimes against persons decreases the number of cases the lab can complete.

* Compared to 2017, a 13% decrease in cases received (see above)
Case Submissions by Type

N=2,584

- Property: 467
- Sexual Assault: 943
- Other: 151
- Assault/Robbery: 707
- Homicide/Death Investigation: 316
CODIS Hits

Drop in CODIS hits reflects a drop in property crimes tested
Specialized DNA analysts who attend select death scenes to collect DNA and trace evidence from bodies that have been:

- Dumped
- Bound
- Thought to have been in close contact with the perpetrator

The team has had a number of successes obtaining DNA different from that of the victim.

DNA information assists investigators in solving crimes.
Trace DNA Collection: Homicide Cases by Cause of Death

- **N=92**
- **54%** Homicides
- **16%** Other causes
- **24%** Accidental
- **6%** Blunt or Sharp
- **5%** Other*

*Other causes include strangulation/asphyxia, homicidal violence, and suicide.*

- **Gun shot wound(s): 50**
- **Blunt or Sharp: 22**
- **Accidental: 15**
- **Other*: 5**

92 collections in 2018

81% (74) of the Trace DNA Collection Cases are Homicides
Crime Laboratory Service:
Forensic Toxicology

Provides analytical services in medicolegal death investigations, driving while impaired (human performance alcohol and drug testing), and drug-facilitated sexual assault investigations.
Forensic Toxicology Laboratory

Analyzes **biological evidence** submitted by the HCIFS Medical Examiner Service and law enforcement agencies in Harris County for:

- Death investigations
- Driving while impaired (DWI) and driving under the influence (DUI) cases
- Drug-facilitated sexual assaults
- Other criminal investigations

HCIFS is the only forensic toxicology laboratory in Texas **dually accredited** by the ANSI National Accreditation Board and the American Board of Forensic Toxicology.
Cases Received and Completed

* Compared to 2017, a 6% increase in cases received and a 13% increase in cases completed
DWI Case Results

- Alcohol Positive Only*: 2,666
- Drug Positive Only: 398
- Alcohol and Drug Positive: 202
- Negative: 78

Total: N=3,344

* Alcohol Positive Only is a case with any ethanol concentration and cannot contain drugs.
DWI Blood Alcohol Concentrations

Number of Cases

Blood Alcohol Concentration (g/100 mL)

- Less than 0.08 g/100 mL
- 0.08 - 0.15 g/100 mL
- Greater than 0.15 g/mL

- 62% of cases had a blood alcohol concentration less than 0.08 g/100 mL.
- 31% of cases had a blood alcohol concentration between 0.08 and 0.15 g/100 mL.
- 7% of cases had a blood alcohol concentration greater than 0.15 g/mL.

Number of Cases:

- Blood Alcohol Concentration (g/100 mL):
  - 0.01
  - 0.02
  - 0.03
  - 0.04
  - 0.05
  - 0.06
  - 0.07
  - 0.08
  - 0.09
  - 0.1
  - 0.11
  - 0.12
  - 0.13
  - 0.14
  - 0.15
  - 0.16
  - 0.17
  - 0.18
  - 0.19
  - 0.2
  - 0.21
  - 0.22
  - 0.23
  - 0.24
  - 0.25
  - 0.26
  - 0.27
  - 0.28
  - 0.29
  - 0.3
  - 0.31
  - 0.32
  - 0.33
  - 0.34
  - 0.35
  - 0.36
  - 0.37
  - 0.38
  - 0.39
  - 0.4
True prevalence may be underrepresented as one case could have multiple drugs from a single drug class, e.g. opiates or benzodiazepines.

Other identified drug classes include: anti-seizure medicines, over-the-counter cough and cold medicines, and anti-depressants.
Crime Laboratory Service:
Physical Evidence

Evaluates fired cartridge casings and bullets recovered from crime scenes and firearms involved in violent, gun-related incidents

Analysis in the three forensic sub-disciplines of Gunshot Residue Analysis, Fire Debris Analysis, and Automotive Paint Analysis
Firearms Identification Laboratory

- Conducts examinations of evidence related to investigations of gun-related offenses
- Cases received are comprised of weapons, bullets, and cartridge casings
- Serves as a regional facility for the National Integrated Ballistics Information Network database
Firearms Identification Casework

- **Number of Cases**
- **Cases Received**
- **Firearms Received**

<table>
<thead>
<tr>
<th>Year</th>
<th>Cases Received</th>
<th>Firearms Received</th>
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<tbody>
<tr>
<td>2013</td>
<td>2,417</td>
<td>2,490</td>
</tr>
<tr>
<td>2014</td>
<td>2,501</td>
<td>2,490</td>
</tr>
<tr>
<td>2015</td>
<td>2,771</td>
<td>2,529</td>
</tr>
<tr>
<td>2016</td>
<td>2,923</td>
<td>2,705</td>
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<tr>
<td>2017</td>
<td>3,334</td>
<td>2,936</td>
</tr>
<tr>
<td>2018</td>
<td>3,324</td>
<td>3,038*</td>
</tr>
</tbody>
</table>

* Compared to 2017, a 4% increase in firearms received
Firearms Cases Completed

N=3,108*

- Pistols: 2,536
- Revolvers: 242
- Rifles: 205
- Shotguns: 108

* There are 17 cases with other types of firearms such as air guns, BB guns, and Derringers.
Provides analytical support to the HCIFS Medical Examiner Service and law enforcement in three areas:

- **Fire Debris Analysis**
  - Examines evidence from fires to assist investigators in determining the presence of ignitable liquid residues

- **Gunshot Residue (GSR) Analysis**
  - Assists in determining whether a person or object has an association with the discharge of a firearm

- **Automotive Paint Analysis**
  - Supports law enforcement investigation into injurious failure to stop and render aid (hit-and-run) incidents
Trace Evidence Casework

Compared to 2017, a 2% decrease in cases received for GSR cases (15 paint analysis cases received during 2018, which was a new case type introduced by Trace Evidence section starting late 2017).
Published Scientific Work

20 published articles in peer-reviewed journals
<table>
<thead>
<tr>
<th>Authors</th>
<th>Title</th>
<th>Publication</th>
</tr>
</thead>
<tbody>
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<td>Fleischman J.M.</td>
<td>Sites of Violence, Sites of Memory: Linking Tuol Sleng (S-21) and Cheoung Ek through Archival and Skeletal Evidence.</td>
<td>Mémoires en jeu (Memories at Stake) 6:76-80.</td>
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<tr>
<td>Authors</td>
<td>Title</td>
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### Publications by HCIFS Doctors and Scientists

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<th>Authors</th>
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Internship and Fellowship Programs
HCIFS prepares students for future careers in forensic science in many different scientific disciplines as well as in technical, professional, and administrative capacities.

16 summer interns and 6 fall interns from the following disciplines were on site in 2018:

- Histology
- Forensic Anthropology
- Forensic Investigations & Emergency Management
- Victim’s Assistance
- Systems Support
- Drug Chemistry
- Firearms Identification
- Forensic Genetics
- Forensic Imaging
- Forensic Toxicology
- Trace Evidence
Forensic Pathology Fellowship:

A one-year fellowship that is a required training program for all new pathologists seeking Forensic Pathology Board certification.

Fellows focus on the data acquisition and documentation processes from medical and non-medical sources with particular emphasis placed on the correlation of scene observations (forensic investigation) with autopsy and forensic toxicological findings.
Medical Examiner Fellowship Programs

**Forensic Anthropology:**

A grant-funded, 12-month training program designed to expose an emerging physical anthropologist to the role of the forensic anthropologist in a medical examiner’s office that serves a large urban population.

During the program, the fellow will participate in casework, attend and process death scenes, process unidentified decedents, and conduct a research project.
**Crime Laboratory Fellowship Programs**

**Forensic Toxicology:**

A two-year fellowship providing training for doctorate-level scientists seeking specialization in forensic toxicology

Upon completion of the program, fellows will be familiar with toxicology laboratory methods and interpretation. Methods include immunoassay screening, sample preparation, liquid and gas chromatography with mass spectrometry, and interpretation of toxicological findings in postmortem, DWI, and drug-facilitated sexual assault cases.
Forensic Genetics:

A two-year program designed to train life science doctorates in casework and validation methods

Upon completion of the program, fellows will have been trained in all casework methods in exactly the same manner as a staff analyst would be. These methods include forensic serology, state-of-the-art DNA analysis methods, DNA interpretation, statistical analysis, and expert witness testimony.
Thank You!