



THE NATIONAL REGISTRY
OF EXONERATIONS

MEDICOLEGAL DEATH INVESTIGATION AND CONVICTING THE INNOCENT

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Version 1.1

Persistent Link: <https://n2t.net/ark:/88112/x2991r>

THE NATIONAL REGISTRY OF EXONERATIONS | AUGUST, 2024

A PROJECT OF THE UNIVERSITY OF CALIFORNIA IRVINE NEWKIRK
CENTER FOR SCIENCE & SOCIETY, UNIVERSITY OF MICHIGAN LAW
SCHOOL, AND MICHIGAN STATE UNIVERSITY COLLEGE OF LAW

Every body has to matter, every body has to count— because when every body matters, everybody matters. When every body counts, everybody counts.

— STEPHEN BERRY, *COUNT THE DEAD: CORONERS, QUANTS, AND THE BIRTH OF DEATH AS WE KNOW IT* (2022)



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EVERY STORY COUNTS.



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Acknowledgements

For comments on drafts, we are grateful to Sarah Chu, Keith Findley, Jeffrey Jentzen, Peter Neufeld, Kurt Nolte, Michael Risinger, Dan Simon, and Victor Weedn. We are grateful to Anna Elgin for research assistance, Dustin Cabral for technical assistance, John Morgan for sharing data, and Matt Durose of the US Bureau of Justice Statistics. Responsibility for any errors rests with the authors.

Suggested Citation

Simon A. Cole, Maurice Possley, Ken Otterbourg, Jessica Weinstock Paredes, Barbara O'Brien, Meghan Cousino, & Samuel R. Gross, "Medicolegal Death Investigation and Convicting the Innocent," National Registry of Exonerations (2024), <https://n2t.net/ark:/88112/x2991r>.

Guide to Abbreviations

ABP:	American Board of Pathology
AOBP:	American Osteopathic Board of Pathology
BJS:	Bureau of Justice Statistics
CDC:	Centers for Disease Control and Prevention
DI:	Death Investigation
IACME:	International Association of Coroners & Medical Examiners
NAME:	National Association of Medical Examiners
NCFS:	National Commission on Forensic Science
NRC:	National Research Council
NRE:	National Registry of Exonerations
OSAC:	Organization of Scientific Area Committees for Forensic Science (of the National Institute of Standards and Technology)
SBS:	Shaken baby syndrome

I. EXECUTIVE SUMMARY

A. THE CASES

- This report analyzes [151 cases](#) in which defendants were exonerated between 1989 and 2023 in the United States and medicolegal death investigation (“death investigation” for short) contributed to the false conviction.
- The 151 exonerees lost a total of 1,837 years in prison, an average of 12.2 years per exoneree. That is less than the average of 14.6 years for exonerees convicted of comparable crimes but for whom death investigation did not contribute to the false conviction.

B. CASE CHARACTERISTICS

- Not surprisingly, [140 \(93%\) of the 151 cases](#) in which death investigation contributed to the false conviction were homicides. However, death investigators did contribute to eleven non-homicide cases, all involving abuse of vulnerable people: children or dependent adults. Eight of these eleven were cases involving the Shaken Baby Syndrome (SBS) diagnosis, in which the top charge was child abuse.
- In [more than one-third of the cases](#), the death investigation evidence consisted of a claim that the medical evidence was consistent with the prosecution’s theory of the crime, e.g., that the victim’s wounds were consistent with a weapon linked to the defendant.
- In [another third](#) of the cases the death investigation evidence concerned *cause of death*.
- [Manner of death](#) and [time of death](#) evidence contributed to fewer cases.

C. DEMOGRAPHICS

- [Women were overrepresented](#) among the defendants for whom death investigation contributed to their false conviction. Thirty-nine (26%) of the defendants in the 151 cases were female, more than three times the 8% of all exonerees who were female. Only around 5% of exonerees convicted of comparable crimes were female.
- Relatedly, cases involving [child victims](#) were particularly vulnerable to contributions by death investigation. Nearly half (47%) of the 151 cases involved child victims. That compares to only 19% of all non-death-

investigation exonerations and 34% of non-death-investigation exonerations for comparable crimes.

- Although concerns have been raised about racial bias in death investigation, the exonerees in death investigation exoneration cases were [whiter than exonerees in general](#). One third of death investigation exonerees were Black compared to 53% of all exonerees. Similarly, 8% of death investigation exonerees were Hispanic, compared to 12% of all exonerees. The higher representation of whites diminishes somewhat if women are removed from the analysis.

D. DEATH INVESTIGATION SYSTEMS

- The United States has a patchwork death investigation system with variations among and within states. The two primary types are medical examiner and coroner systems. Most, but not all, experts perceive medical examiner systems to be superior and call for them to replace coroner systems. We did *not* find that more false convictions occurred under coroner systems. Instead, [false convictions generally occurred in proportion to where more people live](#): their occurrence correlated with those counties' and states' proportions of the US population.
- Nor did we find that more false convictions occurred in systems with [elected](#) (rather than appointed) coroners and death investigators.
- In 22% of cases, the death investigation office that contributed to the false conviction was [accredited](#) by the National Association of Medical Examiners (NAME). Only 17% of US death investigation facilities are accredited.

E. QUALIFICATIONS OF DEATH INVESTIGATORS

- The highest qualification for death investigators in the US is generally considered to be board certification in the subspecialty of forensic pathology by the American Board of Pathology. However, for decades there have not been enough board-certified pathologists in the US to meet the need for death investigation services and autopsies. Therefore, many death investigations and autopsies are performed by less qualified personnel, such as pathologists without board certification, physicians with specialties other than pathology, and even, in some cases, non-physicians such as funeral directors. We did *not* find that most false convictions occurred in cases with underqualified death investigators. In fact, [board-certified forensic pathologists contributed to 61% \(92\) of the 151 cases in this study](#).

- In only 12 of the 151 cases was the expert either a physician with no claim to pathological expertise or not a physician at all. [In the remaining 139 of the 151 cases \(92%\), the expert had some form of pathological expertise.](#)
- Seventy-two different individual board-certified forensic pathologists were the experts in the 92 cases involving board-certified forensic pathologists. This is more than a tenth of the estimated 500 board-certified forensic pathologists practicing in the US during the relevant period. Only two of the 72 are no longer certified. The rest who are alive remain board certified today.
- Contrary to our expectation, exonerations in coroner systems involved [at least as many board-certified forensic pathologists](#) as exonerations in medical examiner systems.
- Twenty-three death investigators were “[repeat players](#)” who contributed to more than one case. The most significant repeat player was widely criticized Mississippi pathologist Stephen Hayne, who contributed to five false convictions.
- Eighteen board certified forensic pathologists were repeat players.
- In two cases, the death investigator was [not a physician](#). One was a funeral director, and one was a toxicologist.

F. SHAKEN BABY SYNDROME/ABUSIVE HEAD TRAUMA

- Cases involving diagnoses of “[Shaken Baby Syndrome](#)” (SBS) or “Abusive Head Trauma” were a significant minority (31) of the 151 cases.
- Death investigators were involved in all 31 known exoneration cases in which SBS contributed to the conviction, but not always as experts for the state. In 9 cases, a death investigator rebutted the evidence of a physician without expertise in forensic pathology. These physicians opined on matters usually considered within the domain of death investigators, such as cause of death.
- In the remaining 22 cases, death investigators gave evidence for the state. In 16 of those 22 cases, that death investigator was a board-certified forensic pathologist. Thus, we did not find evidence that board-certified forensic pathologists avoided involvement in SBS diagnoses.

II. SCOPE OF THE REPORT

A. EXONERATIONS

The National Registry of Exonerations (NRE, or “the Registry”) is an online archive of all known exoneration cases in the United States. “Exoneration” is not a legal category, and its definition is not standardized. The Registry’s definition is that “an exoneration occurs when a person who has been convicted of a crime is officially cleared after new evidence of innocence becomes available.”¹

Exoneration cases can be used to better understand the contributors to criminal convictions that later resulted in exoneration. This can facilitate the improvement of the criminal legal system.

Medicolegal death investigation—which we will call in this report for brevity “death investigation” (DI)—is an important component of the United States criminal legal system. However, it has also been the subject of calls for reform and improvement since at least the 19th century.²

Most discussions of the role of forensic evidence in wrongful convictions in the 1990s and 2000s focused on problem disciplines like serology and microscopic hair comparison more than death investigation. This was probably because those studies were based on data about DNA exonerations which primarily concerned the identity of the perpetrator, rather than contested issues addressed by death investigation, like cause, manner, and time of death.³ The Registry, however, which is not restricted to DNA exonerations, included pathology in its first discussion of the role of forensic evidence in exoneration cases upon its founding in 2012.⁴

This report surveys the role of death investigation in 151 criminal cases that each resulted in an exoneration that occurred between 1989 and 2023. By studying these cases, stakeholders can better understand the role of death investigation in these cases and identify areas for improvement and reform.

These cases are not intended to be understood as any sort of “sample” of death investigation in the US criminal legal system. They are a set of cases which share the rare occurrence of a false conviction followed by the even rarer occurrence of exoneration. Their value lies not in their

¹<https://n2t.net/ark:/88112/x2cg7c>. This page also contains a more detailed definition.

²Jeffrey M. Jentzen, *Death Investigation in America* (2009).

³Brandon L. Garrett & Peter Neufeld, *Invalid Forensic Science Testimony and Wrongful Convictions*, 95 Va. L. Rev. 1, 22 (2009).

⁴Samuel R. Gross & Michael Shaffer, *Exonerations in the United States, 1989-2012*, National Registry of Exonerations, 65 (May, 2012),

http://www.law.umich.edu/special/exoneration/Documents/exonerations_us_1989_2012_full_report.pdf (<https://n2t.net/ark:/88112/x2sk6r>); Simon A Cole & William C Thompson, *Forensic Science and Wrongful Convictions*, in *Wrongful Convictions and Miscarriages of Justice: Causes and Remedies in North American and European Criminal Justice Systems* 111-135, 117 (Huff and Killias eds., 2013).

representativeness, but in their shared attribute of the convicted person’s innocence.⁵ They offer a window into how death investigation can produce the outcome it most seeks to avoid: the conviction of an innocent person.

B. MEDICOLEGAL DEATH INVESTIGATION & FORENSIC PATHOLOGY

This report covers medicolegal death investigation, or “death investigation” for short. The National Institute of Standards & Technology Organization of Scientific Area Committees for Forensic Science (OSAC) defines medicolegal death investigation as:

A formal inquiry into the circumstances surrounding the death of a human being; investigative information is considered with autopsy findings and adjunctive studies (if performed) to determine the cause and manner of death.⁶

The term “death investigation,” however, is ambiguous. Sometimes it is used quite broadly to include all aspects of investigation into a death, including those that are not based in medicine at all. Other authorities contend that death investigation is only properly carried out by experts trained in the medical discipline known as “forensic pathology.” And, for many of those authorities, “forensic pathology” means not pathology in general—the study of disease by, for example, analyzing tissue samples from biopsies—and not pathologists who address or even specialize in legal questions, but rather physicians certified in *forensic* pathology (as opposed to the many other pathological subspecialties) by the American Board of Pathology (ABP), as opposed to any other certifying body. For example, the National Research Council (NRC) has stated flatly that “All medicolegal autopsies should be performed or supervised by a board-certified forensic pathologist.”⁷ ABP board certification requires completion of medical school, residency, a fellowship, a medical license, completion of a set number of autopsies, and passage of a written and practical examination administered by a committee of experts.⁸

OSAC defines forensic pathology as the:

⁵ The Registry’s definition of exoneration is designed to be a conservative proxy for actual innocence by minimizing, though not eliminating, guilty defendant classification errors (guilty defendants misclassified as innocent) at the cost of a great many innocent defendant classification errors (innocent defendants misclassified as unexonerated). For this reason, we characterize the exonerees in the Registry data set as “almost certainly innocent.” We are confident that the number of guilty defendants in the Registry data set is small and that we cannot identify who they are. For further discussion, see Samuel R. Gross & Michael Shaffer, *Exonerations in the United States, 1989-2012*, National Registry of Exonerations, 11-14 (May, 2012), http://www.law.umich.edu/special/exoneration/Documents/exonerations_us_1989_2012_full_report.pdf (<https://n2t.net/ark:/88112/x2sk6r>).

⁶ Organization of Scientific Area Committees for Forensic Science, *Medicolegal Death Investigation: Terms and Definitions*, (Version 2.0) §2.26 (July, 2022), OSAC 2022-N-0026, <https://www.nist.gov/system/files/documents/2022/08/30/OSAC%202022-N-0026%20MDI%20Terms%20Definitions.REGISTRY%20VERSION.pdf> (<https://perma.cc/42E9-UD9L>).

⁷ NRC, *Strengthening Forensic Science in the United States: A Path Forward*, National Research Council, 268 (Feb., 2009), <https://www.ncjrs.gov/pdffiles1/nij/grants/228091.pdf> (<http://perma.cc/DVV2-6CTZ>).

⁸ Kathryn Pinneri, *Education, Training, and Continuing Certification in Forensic Pathology*, 3 *Forensic Anthropology* 97 (2020).

Practice of medicine in which the principles of pathology are applied to problems of potential legal, public health, or public safety significance; a common function is the performance of autopsies to determine the cause of death and assist in determining the manner of death.⁹

Although this report is focused on forensic pathology, we do not define its scope merely as “forensic pathology.” The object of our study is “death investigation,” which we conceive as a domain of scientific inquiry, not a professional occupation.¹⁰ There is a simple, practical reason for this: this report is concerned with the US criminal legal system as it is, not as it ought to be, and not all death investigations in the United States are carried out by forensic pathologists.

The term “forensic pathologist” itself is ambiguous because sometimes it assumes board certification in the subspecialty of forensic pathology and sometimes it does not. Some experts and courts use the term casually to describe a pathologist who carries out death investigations or provides legal evidence. Others insist that the term “forensic pathologist” should be reserved for physicians who are board certified in the subspecialty of forensic pathology by the ABP, with narrow exceptions. For example, in 2015 the National Commission on Forensic Science (NCFS) defined a “forensic pathologist” as a physician who is board certified by the ABP, but it provided two exceptions by which a physician could qualify as a “forensic pathologist” prior to being board certified. The first required substantial specialized training and was temporary, and the second required substantial specialized training and substantial experience.¹¹

OSAC, similarly, defines a forensic pathologist as a:

Physician who is board-certified in forensic pathology by an accredited credentialing body; currently American Board of Pathology and American Osteopathic Board of Pathology.¹²

In this report, the term “board certified” always means board certified in forensic pathology by the ABP.

However, during the period under study, many death investigations in the US were carried out by experts who were not board-certified forensic pathologists. One reason for this is that, as the NCFS wrote in 2015, “there currently are not enough board-certified forensic pathologists in the United States to meet national needs, with some areas having limited or no access to” forensic pathologists.¹³ “Consequently,” the NCFS continued, “forensic autopsies are being performed by

⁹ OSAC 2022-N-0026, §2.19

¹⁰ The notion of a “domain” is borrowed from Andrew Abbott, *The System of Professions: An Essay on the Division of Expert Labor* (1988).

¹¹ NCFS, *Increasing the Number, Retention, and Quality of Board-Certified Forensic Pathologists*, National Commission on Forensic Science, 2 (Aug. 11, 2015), <https://www.justice.gov/ncfs/file/787356/dl?inline> (<https://perma.cc/5MKC-XSM7>).

¹² Organization of Scientific Area Committees for Forensic Science. [American Osteopathic Board of Pathology \(AOBP\) certification in forensic pathology](#) is far less discussed in the death investigation literature than ABP certification, and we were not able to learn much about it. E.g., Pinneri, *Education, Training, and Continuing Certification in Forensic Pathology*, 101. We found no expert in our study who claimed board certification by AOBP. See section V.G.1.

¹³ NCFS, *Increasing the Number*, 2.

non-forensic pathologists who may not be qualified.”¹⁴ Indeed, the NCFS estimated that 1,100-1,200 forensic pathologists were needed to conduct forensic autopsies in the US, but there were only around 500 board-certified forensic pathologists in the United States.¹⁵ Another reason is that in child abuse cases, “child abuse pediatricians” have claimed for themselves the authority to determine cause and manner of death when child abuse is suspected.¹⁶

The surplus forensic autopsies and death investigations that could not be performed by board-certified forensic pathologists were performed by a variety of other, less appropriately qualified, personnel. These “non-forensic pathologists,” as the NCFS called them, included (in rough order of the appropriateness of their qualifications):

- Physicians who were board certified by the ABP in a different subspecialty of pathology, usually anatomical or clinical pathology or both;
- Physicians who specialized in pathology, but were not board certified in any subspecialty;
- Physicians who did not specialize in pathology but were hired to perform autopsies by medical examiner or coroner offices;
- Physicians who practiced other specialties, such as pediatrics or neurosurgery, but who nonetheless rendered expert evidence in the domain of forensic pathology;
- Coroners who were not physicians, such as nurses, medical technologists, pathologist assistants, or funeral directors (see section V.G.7).

To further complicate matters, death investigation in the US was not only practiced by experts with a variety of qualifications; the experts worked in a variety of organizational settings. The US notoriously has a dual death investigation system that varies by jurisdiction and is composed of two primary types of system: medical examiner and coroner systems. This is a result of the colonial importation of the coroner system from Britain followed by the rise of the rival continental-influenced medical examiner system beginning in the 19th century. In a sense, the US may be understood as still in a gradual transition from a coroner system to a medical examiner system that has been underway for more than a century.¹⁷ In addition, in a small number of jurisdictions, the death investigation system is run by neither a medical examiner nor a coroner: County Attorneys in all of Nebraska and in rural Washington and New York counties, Justices of the Peace in rural Texas counties, Sheriffs in rural California and Montana counties, and Chiefs of Police in rural Hawaii counties.¹⁸

¹⁴ Id., 1.

¹⁵ Id., 3.

¹⁶ Keith A. Findley & Dean A. Strang, *Ending Manner-of-Death Testimony and Other Opinion Determinations of Crime*, 60 Duq. L. Rev. 302, 333 (2022). The American Board of Pediatrics began offering board certification in child abuse pediatrics in 2009. The training requirements include successful completion of a subspecialty fellowship program and a certifying examination. <https://www.abp.org/content/child-abuse-pediatrics-certification>

¹⁷ NRC, *Strengthening Forensic Science in the United States: A Path Forward*, 241-242; Ian A. Burney, *Bodies of Evidence: Medicine and the Politics of the English Inquest, 1830-1926*, 53 (2000); Jeffrey Jentzen, *Death and Empire: Medicolegal Investigations and Practice across the British Empire*, in *Global Forensic Cultures: Making Fact and Justice in the Modern Era* 149-173, 153 (Burney and Hamlin eds., 2019); Deborah Blum, *The Poisoner’s Handbook: Murder and the Birth of Forensic Medicine in Jazz Age New York* (2011); Stefan Timmermans, *The Cause of Death vs. The Gift of Life: Boundary Maintenance and the Politics of Expertise in Death Investigations*, 24 *Sociology of Health & Illness* 550, 554 (2002); Julie Johnson, *Coroners, corruption and the politics of death: forensic pathology in the United States*, in *Legal Medicine in History* 268-289 (Clark and Crawford eds., 1994).

¹⁸ <https://www.cdc.gov/nchs/comec/Medical-Death-Investigation-System-by-County-12-19-2023.pdf> (<https://perma.cc/7FRE-9AAU>);

To complicate matters still further, the term “medicolegal death investigator” can be used to refer to a physician who carries out autopsies but can also be used to refer to the growing ranks of “multidisciplinary” lay employees of death investigation offices:

Medicolegal death investigators [MDIs] function as a type of physician extender for the forensic pathologist/medical examiner. These investigators are identified by a number of various job titles, including forensic investigator, coroner, and deputy coroner. The investigators perform scene investigations, examine bodies of deceased individuals, collect and process evidence, obtain medical and investigative information, and interact with families and outside agencies. In many aspects, they are in fact the objective eyes and ears of several medical, legal, and social agencies acting on behalf of the deceased . . . The background of the lay investigator is variable. Typically the MDIs are experienced as paramedics, law enforcement personnel, nurses, or other types of investigation-based job titles (e.g., insurance or security guard).¹⁹

In defining the scope of this report, we were stuck between the terms “death investigation,” which describes a domain on inquiry that exists in the US, and “forensic pathology,” which describes the expert discipline that most authorities agree should, but does not, have full “jurisdiction” over that domain.²⁰ Given this landscape, this report covers death investigation broadly. It includes all exoneration cases in which experts broadly defined as “forensic pathologists,” “coroners,” and “medical examiners” contributed to the conviction even when they strayed outside the domain of death investigation, as, for example, in a handful of child abuse cases. It also includes exoneration cases in which an expert gave evidence that fell within the scientific domain of death investigation—that is, evidence that purports to answer the questions described in the definitions of death investigation and forensic pathology quoted above—even when that expert did not have the credentials of an official “death investigator.” So it includes all cases in which an expert witness rendered evidence about the cause or manner of death, even if that expert was not board certified, or not even a pathologist. It even includes one case in which the expert was not even a physician. The report also includes nine cases in which forensic pathologists signaled that the medicolegal issue fell within their domain of expertise by rebutting medical diagnoses of Shaken Baby Syndrome (SBS) offered by non-pathologist physicians (section V.G.6).

It should be noted, however, that forensic pathologists did not always rebut SBS diagnoses. As we discuss below (section V.J.1), more often they supported, or in some cases even initiated, SBS diagnoses. Death investigation evidence was involved, either as state’s evidence or rebuttal evidence, in all 31 cases in the Registry in which SBS contributed to the conviction, even in the eight cases in which the victim did not die and the charge was child abuse.

C. CONTRIBUTED TO THE CONVICTION

<https://www.cdc.gov/nchs/comec/state-mec-organizations.html> (<https://perma.cc/49JJ-CCCR>).

¹⁹ Jeffrey Jentzen et al., *Medicolegal Death Investigator Preemployment Test Development*, 17 Am J Forensic Med Pathol 112, 112 (1996)

<http://ovidsp.ovid.com/ovidweb.cgi?T=JS&PAGE=reference&D=ovfib&NEWS=N&AN=00000433-199606000-00006>.

²⁰ As with “domain,” the concept of professional “jurisdiction” is borrowed from Abbott, *The System of Professions*.

This report only includes cases in which death investigation “contributed” to the false conviction. It would make little sense to include all cases in which death investigation played any role at all because death investigation, by definition, occurs in virtually every homicide case, at least by finding that the manner of death was homicide. For our purposes, death investigation only “contributed” to the conviction if it supported a fact that was *contested*. So, for example, if the death investigator concluded only that the manner of death was homicide, and both prosecution and defense agreed that the death was a homicide, death investigation did not contribute to the conviction. However, if the defense contested that the death was homicide, suggesting that the death might have been an accident, illness, or suicide, then the classification of the manner of death as homicide did contribute to the conviction. Similarly, if the death investigator concluded only that the victim died by a gunshot, and both prosecution and defense agreed that the victim was killed by a gunshot, then death investigation did not contribute to the conviction. If, however, the death investigator concluded that the victim died by a gunshot fired by someone standing up, and the defendant claimed to have shot the victim in self-defense while lying on the ground, then death investigation did contribute to the conviction.

This rule excluded most homicide exonerations from this study. This study includes only those cases in which death investigation supported a contested fact.

The Registry uses the term “contributed” to mean that the evidence was known to the factfinder and that it tended to disadvantage the defendant. We make no claims about whether or to what extent the factfinder actually was influenced by the evidence in rendering their decision to convict. That is an impossible task; we cannot know what was in the minds of factfinders.²¹

We did not require that the death investigation evidence be “wrong” or falsified in some way. Although, as will be discussed further below (Section V.K.1), in most cases someone (such as another death investigator or the original death investigator themselves) later disagreed with the conclusion communicated to the factfinder at the time of conviction, there were many other cases in which that did not occur. Requiring that death investigation evidence be falsified sets too high a burden for several reasons. First, the exoneration process may not involve or require reconsideration of the death investigation evidence. Exonerations occur in a variety of ways, and there are many cases in which newly discovered evidence may drive the legal exoneration process in a way that bypasses reconsideration of the death investigation evidence. Reconsideration of the death investigation evidence may not be required, or even be in the interest of either litigant.

Second, the Registry usually operates with imperfect information. The death investigation evidence may have been falsified or contradicted, but that may not be captured in the Registry’s source documents on the case.

Third, as discussed further below (Section V.K.3), death investigation, like many other forensic disciplines, is prone to broad, vague statements that are difficult to prove false—e.g., “the wound

²¹ In referring to factfinders, we remind readers that some convictions were achieved by guilty pleas. For guilty plea cases, the same reasoning applies: for factfinders we would substitute all the actors (defendant, defense attorney, prosecutor, judge) involved in the plea negotiations. Again, we would require only that the death investigation evidence was known to these actors and that it tended to disadvantage the defendant.

could have been made by the defendant’s knife” —and yet may be perceived by the factfinder as having significant probative value.

The main body and data set of this report covers criminal convictions in which the *exoneration* occurred between 1989 and 2023 because that is the scope of the primary registry of the NRE. The year of the first DNA exoneration in the US, 1989, serves as a reasonable landmark for the “modern” era of exonerations. It also ensures that the data set is confined to cases that are relatively recent and thus may reasonably be understood to reflect our current criminal legal system. In a separate section, we discuss a small number of cases in which the exoneration occurred before 1989.

In Part III, we provide some brief background information about death investigation in the US. In Part IV, we give a broad overview of the cases. Part V contains our analysis of the cases. In section V.A, we discuss the nature of the evidence given (e.g., cause of death, manner of death, time of death, etc.). In section V.B, we discuss demographic issues, such as the gender, race, and age of defendants and victims. In section V.C, we discuss the geographic distribution of cases, and in section I.A, we discuss the trends in the occurrence of cases over time. In section V.E, we discuss how the cases were distributed across the nation’s variety of death investigation systems. Section V.F discusses accreditation of death investigation facilities. In section V.G, we discuss the occupational identities of the experts involved in the cases. Section V.H explores how occupational identity varied across different types of death investigation system. Section V.I discusses “repeat players,” experts who contributed to more than one conviction. Section V.J discusses “trouble spots,” three known areas of concern in death investigation: SBS, now more commonly known as Abusive Head Trauma (AHT); fatal fires; and the tendency to fit evidence to the prosecution theory of the crime. Section V.K discusses “problems”—that is the flaws that were exposed in the death investigation. Part VI offers some concluding takeaways from the report.

III. DEATH INVESTIGATION

The duty of a coroner to investigate “sudden” deaths dates back to Britain around the 9th or 10th century and grew in importance in the 13th century.²² The American colonies imported the coroner system from Britain.²³ In the 19th century, however, some states began recognizing the need for medical training for coroners, and some began replacing them with “medical examiners” who usually had such training.²⁴ Coroner and medical examiner systems then co-existed in the US and still do.

But coroners and medical examiners were (and are) quite different. “With few exceptions ‘coroners’ in the US have been elected lay persons who rely on available medical personnel to

²² NRC, *Strengthening Forensic Science in the United States: A Path Forward*, 241; Burney, *Bodies of Evidence*, 53; Jentzen, *Death and Empire*, 153; Stephen Berry, *Count the Dead: Coroners, Quants, and the Birth of Death as We Know It*, 60 (2022).

²³ NRC, *Strengthening Forensic Science in the United States: A Path Forward*, 241. Timmermans, *The Cause of Death*, 554; Johnson, *Coroners, corruption and the politics of death*; Jentzen, *Death and Empire*, 153.

²⁴ NRC, *Strengthening Forensic Science in the United States: A Path Forward*, 241-242; Blum, *The Poisoner’s Handbook: Murder and the Birth of Forensic Medicine in Jazz Age New York*.

assist in inquests, while ‘medical examiners’ are usually appointed physicians and pathologists who have special training in medico-legal death investigations and forensic autopsies.”²⁵

In 1928, the National Academy of Sciences called for abolishing coroner offices nationwide in favor of medical examiners.²⁶ Over nearly a century, this call has been periodically renewed and made some progress, but it was never fully heeded.²⁷ In 2009, the NRC renewed its 1928 call to improve medicolegal death investigation recommending that “All medicolegal autopsies should be performed or supervised by a board-certified forensic pathologist.”²⁸ As one historian and forensic pathologist remarks, “The office of English coroner has remarkable staying power on American soil.”²⁹ Today, 14 states still have coroner systems, and 14 other states have mixed systems with medical examiners in some (mostly urban) counties and coroners in other (mostly rural) counties (Figure 1; section V.E.1 below).³⁰ Coroner offices cover around 28% of the US population (Figure 2 and Figure 11). The majority of those coroners are elected (Figure 14).

²⁵ Timmermans, *The Cause of Death*, 554.

²⁶ NRC, *Strengthening Forensic Science in the United States: A Path Forward*, 242.

²⁷ *Id.*, 242-243. Timmermans, *The Cause of Death*, 554.

²⁸ NRC, *Strengthening Forensic Science in the United States: A Path Forward*, 268.

²⁹ Jentzen, *Death and Empire*, 154.

³⁰ <https://www.cdc.gov/phlp/publications/coroner/death.html> (<https://perma.cc/5UW9-DVQ9>)

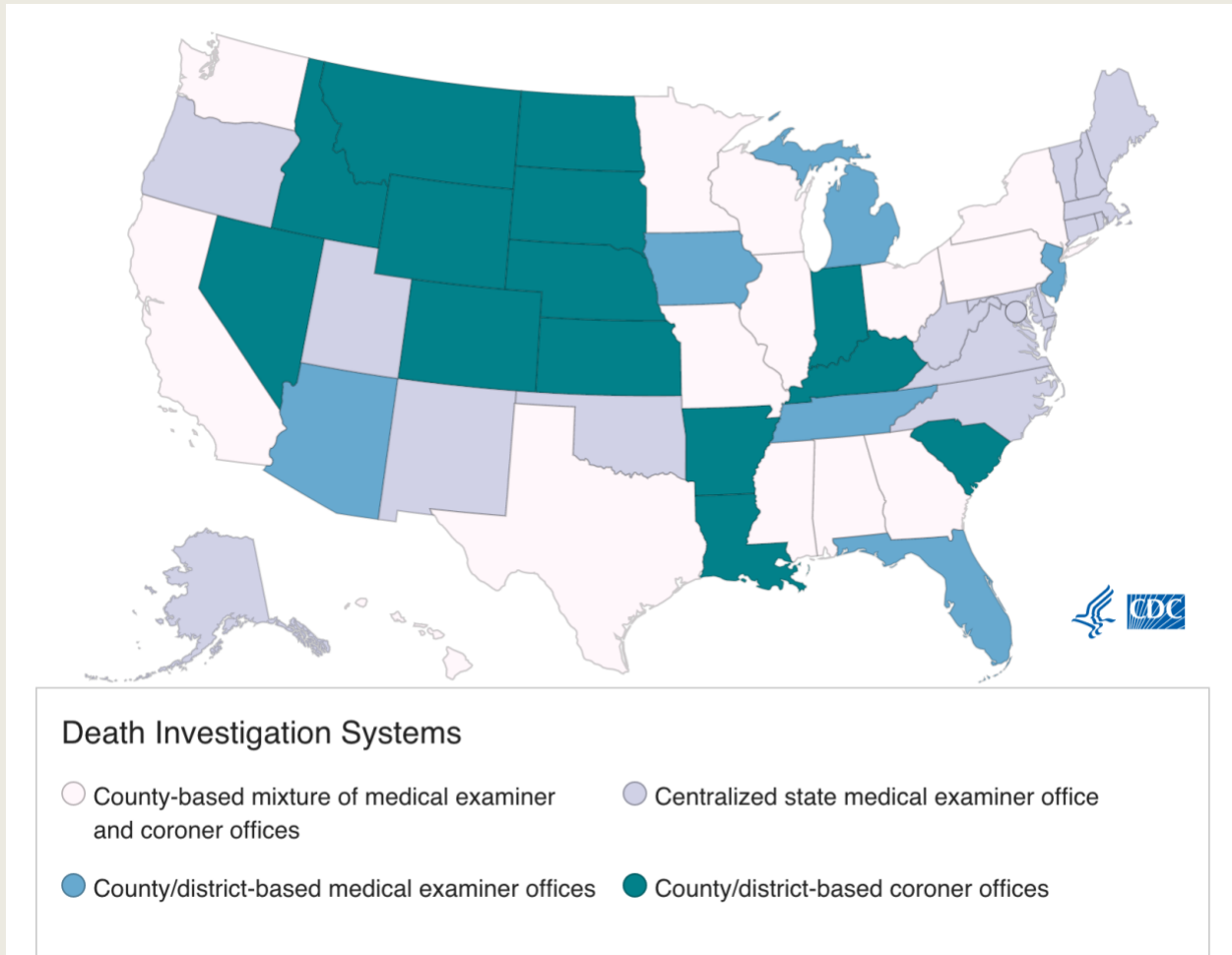


Figure 1. Death Investigation Systems, by State. Source: Centers for Disease Control, <https://www.cdc.gov/php/publications/coroner/death.html> (<https://perma.cc/5UW9-DVQ9>)

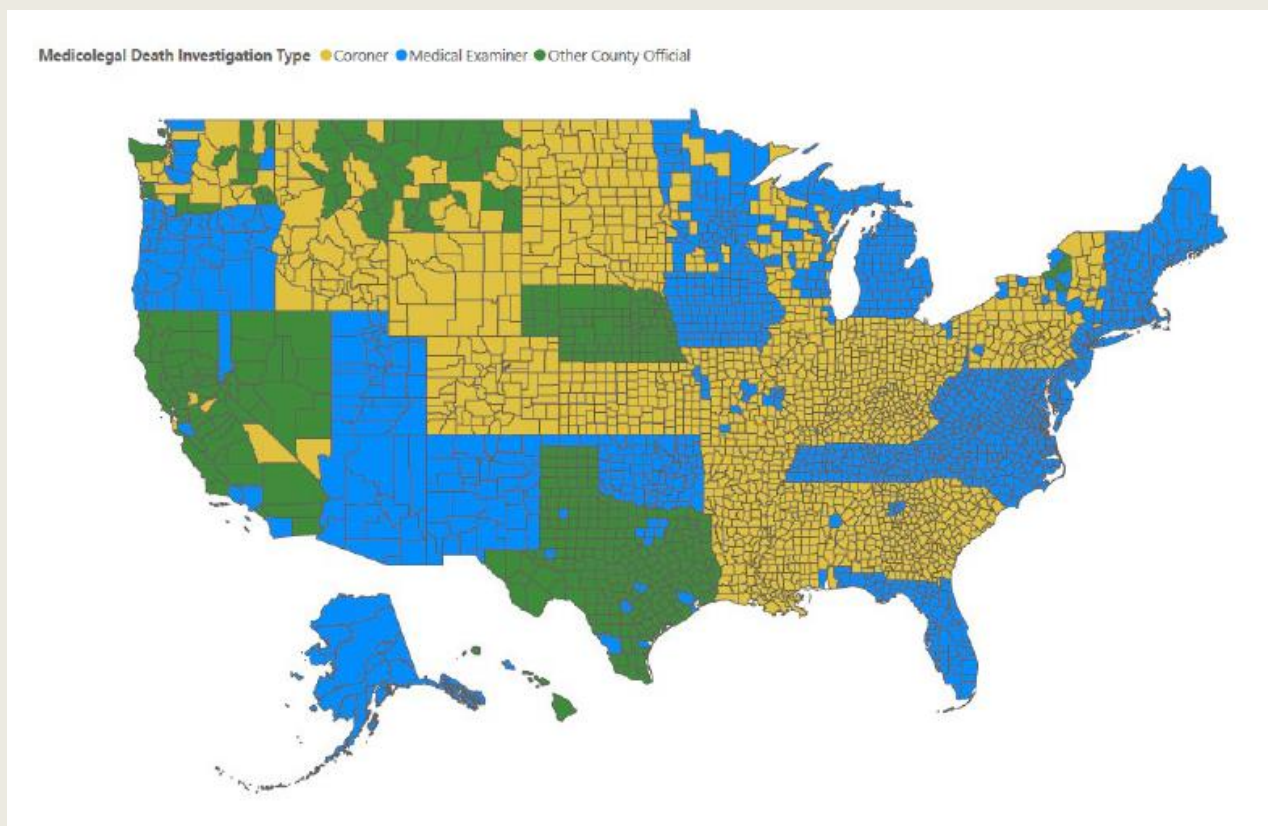


Figure 2. Type of Medical Death Investigation System, by County. Source: Centers for Disease Control, Collaborating Office for Medical Examiners and Coroners, <https://www.cdc.gov/nchs/comec/Medical-Death-Investigation-System-by-County-12-19-2023.pdf> (<https://perma.cc/7FRE-9AAU>)

In the period under study, “death investigations in the United States rely on a patchwork of coroners and medical examiners and . . . these vary greatly in the budgets, staff, equipment, and training available to them, and in the quality of services they provide.”³¹ In 2003, the chair of an Institute of Medicine panel on death investigation, reflecting on this situation, said “there really is no . . . system of death investigation . . . in this county.”³²

Coroners, the NRC commented, “may or may not be physicians, may or may not have medical training, and may or may not perform autopsies.”³³ In 2007, a high school senior made headlines by becoming certified as a coroner in Indiana.³⁴ “In contrast, medical examiners are almost always physicians, are appointed, and are often pathologists or forensic pathologists.”³⁵ However, the NRC’s use of the word “almost” was surely deliberate. “In 1981, after bitterly contested referendum, Racine County, Wisconsin became the first county jurisdiction in the United States to

³¹ NRC, *Strengthening Forensic Science in the United States: A Path Forward*, 250. Timmermans, *The Cause of Death*, 554.

³² Quoted in Jentzen, *Death Investigation in America*, 94.

³³ NRC, *Strengthening Forensic Science in the United States: A Path Forward*, 247.

³⁴ *Teen Becomes State’s Youngest Coroner*, Associated Press, May 13, 2007.

³⁵ NRC, *Strengthening Forensic Science in the United States: A Path Forward*, 248.

appoint a nonphysician,” a medical technologist, “to the position of medical examiner.”³⁶ Seven more Wisconsin counties followed Racine’s example.³⁷

These differences between the two systems notwithstanding, because of the shortage described above, in most cases neither medical examiner nor coroner offices are able to assign all forensic autopsies to board-certified forensic pathologists. Both types of office are forced to hire or contract other, less appropriately qualified, individuals to perform these functions. In some small counties, the death investigation “system” may simply outsource the medical work to a larger, neighboring county. According to the Bureau of Justice Statistics, (BJS) more than half of the death investigation offices in the US used external organizations to conduct partial or complete autopsies.³⁸ For example, the false conviction of [Michael Morton](#) for murder in 1987 occurred in Williamson County, Texas, whose death investigation system is administered by a Justice of the Peace. However, Williamson was “one of numerous counties . . . that sent bodies to” Travis County Medical Examiner Roberto Bayardo to perform autopsies.³⁹

Medical examiners or coroners have a legal responsibility to determine the “manner” and “cause” of death.⁴⁰ “Manner” of death is a set of prescribed categories of circumstances that is used for government public health record-keeping, as well as occasional “off-label” uses for things like criminal investigations and expert testimony in court.⁴¹ The possible categories of manner are set by law and vary across jurisdictions, but generally include: natural, accident, homicide, suicide, undetermined, and sometimes pending.⁴² Death investigators are less constrained in the terms they can use to describe “causes” of death (diseases or injuries that initiate the fatal sequence of events leading to death), such as “strangulation” or “head trauma.” Death investigators combine the legal responsibility to report manner of death, which they “inherited” from the English coroner system, with public health responsibilities.⁴³ Death investigators are responsible for “counting the dead,” keeping or contributing to statistics on deaths and kinds of death. This serves an important function in alerting the governments to trends in death and its causes. The improvement of record-keeping in death statistics played an important role in the dramatic increases in life expectancy that humans have enjoyed over the past several centuries.⁴⁴

Death investigation has been contested and criticized since the 19th century, and these critiques have not abated in recent decades: “critics have charged medical experts with cognitive bias,

³⁶ Jentzen, *Death Investigation in America*, 163.

³⁷ *Id.*, 164.

³⁸ Connor Brooks, *Medical Examiner and Coroner Offices, 2018*, Bureau of Justice Statistics, 7 (Nov., 2021), <https://bjs.ojp.gov/content/pub/pdf/meco18.pdf>.

³⁹ *Body of Evidence: A Medical Examiner’s Missteps*, Austin KXAN, Feb. 19, 2016, <https://www.kxan.com/news/body-of-evidence-a-medical-examiners-missteps/> (<https://perma.cc/Q3VL-RKQE>).

⁴⁰ Stefan Timmermans, *Postmortem: How Medical Examiners Explain Suspicious Deaths*, 21 (2006).

⁴¹ William Oliver et al., *Cognitive Bias in Medicolegal Death Investigation*, 5 *Academic Forensic Pathology* 548, 553 (2015).

⁴² Dan Simon, *Minimizing Error and Bias in Death Investigations*, 49 *Seton Hall Law Review* 255, 266 (2019).

⁴³ D. Michael Risinger, *Managing Task-irrelevant Information in the Practice of Forensic Pathology—Recognizing Potential Problems and Considering Solutions*, discussion draft (July, 2021); Simon, *Minimizing Error and Bias in Death Investigations*, 294; William C. Thompson, *Determining the Proper Evidentiary Basis for an Expert Opinion: What Do Experts Need to Know and When Do They Know Too Much?*, in *Blinding as a Solution to Bias: Strengthening Biomedical Science, Forensic Science, and Law* 133-150, 147 (Robertson and Kesselheim eds., 2016).

⁴⁴ Berry, *Count the Dead*.

human error, and incompetence.”⁴⁵ Scandals involving unethical or incompetent death investigators have raised concerns about the credibility of the discipline and its potential to contribute to miscarriages of justice. In the 1990s, a scandal erupted around Texas medical examiner, Ralph Erdmann, who faked autopsies, lost or contaminated evidence, and employed unqualified assistants.⁴⁶ In Ontario, Canada, in 2008, after a scandalous wrongful conviction involving pediatric forensic pathology, a major government inquiry exposed poor training, practices, and oversight in the field.⁴⁷

Although some medical examiners are government employees, many small jurisdictions contract private doctors to provide medical examiner services and perform autopsies. Such practices can produce scandals that combine venality with injustice, illustrated most prominently by the checkered career of Mississippi medical examiner Stephen Hayne.⁴⁸

As concerns about contextual bias arose in forensic science,⁴⁹ death investigation was in an unusual position. Pattern recognition disciplines, not death investigation, were the focus of early arguments about bias in forensic science.⁵⁰ Death investigation was (mostly) practiced by medical doctors, making it among the most highly credentialed forensic specialties, in stark contrast to feature-comparison disciplines, that have been criticized for low educational barriers to entry.⁵¹ Historically, death investigators’ perspective followed their training in medicine—evaluations should be done with as much information possible. Amending an opinion based on “task-irrelevant” information, such as investigative information from the police, seemed consistent with the physician’s task of making a diagnosis based on all available information.⁵² In addition, in their public health functions (as opposed to their functions as expert witnesses in court), such as determining manner of death, death investigators function more like finders of fact, like juries, as the final arbiters of legal questions. Legal scholars noted that “while context management techniques are well-suited for bench examinations, they may not be suitable in forensic disciplines practiced in field settings, which entail dynamic and open-ended investigative processes that often

⁴⁵ Jentzen, *Death and Empire*, 152.

⁴⁶ Barry Scheck et al., *Actual Innocence: Five Days to Execution and Other Dispatches from the Wrongly Convicted*, 117-119 (2000). Erdmann contributed to one false conviction discussed in this report, Adolph Munson.

⁴⁷ Stephen T. Goudge, *Inquiry into Pediatric Forensic Pathology in Ontario*, Ontario Ministry of the Attorney General, (2008), https://www.archives.gov.on.ca/en/e_records/goudge/report/index.html (<https://perma.cc/LYA4-QF87>); Michael S. Pollanen, *Forensic Pathology and the Miscarriage of Justice*, 8 *Forensic Sci. Med. Pathol.* 285 (2012); Stephen Cordner, *Forensic Pathology and Miscarriages of Justice*, id.316; Kent Roach, *More Procedure and Concern about Innocence but Less Justice: Remedies for Wrongful Convictions in the United States and Canada*, in *Wrongful Convictions and Miscarriages of Justice: Causes and Remedies in North American and European Criminal Justice Systems* 283-308 (Huff and Killias eds., 2013).

⁴⁸ Radley Balko & Tucker Carrington, *The Cadaver King and the Country Dentist: A True Story of Injustice in the American South*, 91-103 (2018).

⁴⁹ Saul M. Kassin et al., *The Forensic Confirmation Bias: Problems, Perspectives, and Proposed Solutions*, 2 *Journal of Applied Research in Memory and Cognition* 42 (2013).

⁵⁰ D. Michael Risinger et al., *The Daubert/Kumho Implications of Observer Effects in Forensic Science: Hidden Problems of Expectation and Suggestion*, 90 *California Law Review* 1 (2002); Simon, *Minimizing Error and Bias in Death Investigations*, 288.

⁵¹ Michael J. Saks & Jonathan J. Koehler, *The Coming Paradigm Shift in Forensic Identification Science*, 309 *Science* 892 (2005); David A. Stoney, *A Medical Model for Criminalistics Education*, 33 *J. Forensic Sci.* 1086 (1988).

⁵² E.g., Oliver et al., *Cognitive Bias in Medicolegal Death Investigation*.

involve close interaction with other investigative branches. Topmost in this category is the field of death investigation.”⁵³

This position, however, was soon criticized as social scientists and legal scholars argued that the concerns about cognitive bias applied as much to death investigators as to other forensic experts, regardless of their historical practice of maximizing information and their legal responsibility to make manner of death determinations based on all available evidence.⁵⁴ Death investigators countered that this was precisely wrong—that “We should be working on how to get more information, both of scientific information and case information to the investigators, not less.”⁵⁵ Some legal scholars rejoined that when death investigations are biased, or false, adversarial legal systems have poor records at correcting the errors.⁵⁶ Others argued that full information was appropriate for death investigators’ public health functions but not for their legal functions.⁵⁷

The discourse surrounding death investigation changed dramatically following the murder of George Floyd by a police officer in Minneapolis in 2020. First, the trial of the police officer, Derek Chauvin, hinged critically on the death investigation—whether there was an explanation for Floyd’s death other than Chauvin’s actions. This controversy focused attention on the role of death investigation in offering alternate explanations for deaths in police custody in general.⁵⁸ The notion of “excited delirium” came under particular scrutiny, with researchers arguing that the diagnosis had no basis in medicine, was deployed in a racially skewed manner, and served to obscure the racial patterns of deaths in police custody.⁵⁹

The trial also highlighted the contested nature of expertise in death investigation in that the trial displayed a “battle” of death investigation experts and a private second autopsy.⁶⁰ And it drew attention to emerging empirical work that found evidence of both cognitive and racial bias in forensic pathology.⁶¹ This finding was vigorously contested by death investigators.⁶²

⁵³ Simon, *Minimizing Error and Bias in Death Investigations*, 261.

⁵⁴ Thompson, *Determining the Proper Evidentiary Basis for an Expert Opinion: What Do Experts Need to Know and When Do They Know Too Much?*, 136; Itiel E. Dror et al., *No one is immune to contextual bias—Not even forensic pathologists*, 7 *Journal of Applied Research in Memory and Cognition* 316 (2018).

⁵⁵ Oliver et al., *Cognitive Bias in Medicolegal Death Investigation*, 556; See comment in Simon, *Minimizing Error and Bias in Death Investigations*, 261.

⁵⁶ David Hamer & Gary Edmond, *Forensic Science Evidence, Wrongful Convictions and Adversarial Process*, 38 *U. Queensland L.J.* 185 (2019).

⁵⁷ Findley & Strang, *Ending Manner-of-Death Testimony*.

⁵⁸ Ann Crawford-Roberts et al., *George Floyd’s Autopsy and the Structural Gaslighting of America*, *Scientific American*, June 6, (2020), <https://blogs.scientificamerican.com/voices/george-floyds-autopsy-and-the-structural-gaslighting-of-america/> (<https://perma.cc/GN5U-RVP6>); Roger Mitchell & Jay D. Aronson, *Death in custody : how America ignores the truth and what we can do about it* (2023).

⁵⁹ Osagie K. Obasogie, *EXCITED DELIRIUM AND POLICE USE OF FORCE*, 107 *Va. L. Rev.* 1545 (2021) <https://www.jstor.org/stable/27135603>.

⁶⁰ On private autopsies, see Erika Hayasaki, *The Police Called it an Accident: She Turned to 1-800-Autopsy*, *New York Times*, July 8, 2021, <https://www.nytimes.com/2021/07/08/magazine/the-police-called-it-an-accident-she-turned-to-1-800-autopsy.html>.

⁶¹ Itiel Dror et al., *Cognitive Bias in Forensic Pathology Decisions*, *J. Forensic Sci.* (2021).

⁶² E.g., Brian L. Peterson et al., *Commentary on: Dror IE, Melinek J, Arden JL, Kukucka J, Hawkins S, Carter J, et al. Cognitive bias in forensic pathology decisions. J Forensic Sci.* <https://doi.org/10.1111/1556-4029.14697>. *Epub 2021 Feb 20*, 66 id.2541 <https://onlinelibrary.wiley.com/doi/abs/10.1111/1556-4029.14843>; Itiel E. Dror et al., *Authors’ Response to Peterson et al Commentary on*, id.2545 <https://onlinelibrary.wiley.com/doi/abs/10.1111/1556-4029.14856>; Rexson Tse et al., *Commentary on: Dror I, Melinek J, Arden JL, Kukucka J, Hawkins S, Carter J, et al.*

Death investigators, some of them Black, were criticized for participating in a study of cognitive bias in death investigation. In the Chauvin case, other Black forensic pathologists were criticized for contesting the state pathologist's findings, which, though classifying the death as a homicide, also said heart disease, fentanyl, and methamphetamine contributed to the death. The racially charged nature of the case—and the response to it—exposed concerns about racism in the discipline of forensic pathology itself.⁶³

The controversy surrounding the Chauvin trial, in turn, provoked an investigation and audit into cases handled by the former chief medical examiner of Maryland, who was an expert for the defense in the Chauvin trial.⁶⁴

IV. THE CASES

This report covers 151 cases in which death investigation, as defined in section II.B, contributed to a false conviction that later resulted in exoneration. These cases constitute 5% of the 3,392 exoneration cases listed in the Registry on the date of analysis, October 5, 2023. They constitute 16% of the 974 of those 3,392 cases in which False or Misleading Forensic Evidence contributed to the false conviction.

A. CRIME TYPE

The cases essentially involved only two types of crimes. Not surprisingly, almost all (93%) exonerations to which death investigation contributed were homicide cases. However, occasionally death investigators were drawn into cases in which the top charge was not homicide. All these cases involved the abuse of a vulnerable person, usually a child, but sometimes a dependent adult or medical patient (Table 1). Eight of the 11 abuse cases were SBS cases in which child abuse was the top charge.

Cognitive bias in forensic pathology decisions. J Forensic Sci. doi: 10.1111/1556-4029.14697. Epub 2021 Feb 20, id.2567 <https://onlinelibrary.wiley.com/doi/abs/10.1111/1556-4029.14839>; Itiel E. Dror et al., *Authors' Response to Tse et al Commentary on*, id.2569 <https://onlinelibrary.wiley.com/doi/abs/10.1111/1556-4029.14854>; William Oliver, *Commentary on: Dror IE, Melinek J, Arden JL, Kukucka J, Hawkins S, Carter J, et al. Cognitive bias in forensic pathology decisions. J Forensic Sci.* <https://doi.org/10.1111/1556-4029.14697>. Epub 2021 Feb 20, id.2563 <https://onlinelibrary.wiley.com/doi/abs/10.1111/1556-4029.14841>; Itiel E. Dror et al., *Authors' Response to Oliver Commentary on*, id.2565 <https://onlinelibrary.wiley.com/doi/abs/10.1111/1556-4029.14853>.

⁶³ Shalia K. Dewan, *With George Floyd, A Raging Debate Over Bias in the Science of Death*, New York Times, Apr. 14, 2021, <https://www.nytimes.com/2021/04/14/us/george-floyd-death-forensic-science.html> (<https://perma.cc/KGB6-L2A2>).

⁶⁴ Brian E. Frosh, Office of Attorney General Releases Report of OCME Audit Design Team, Type, (Oct. 19, 2022), <https://www.marylandattorneygeneral.gov/press/2022/101922.pdf> (<https://perma.cc/LQN5-QU3J>).

Table 1. Type of crime in death investigation cases.

Crime	Number	%
Homicide (includes murder, manslaughter, and accessory to murder)	140	93%
Abuse of vulnerable person (includes child abuse, child sex abuse, patient abuse and neglect, and dependent adult abuse)	11	7%
Grand Total	151	100%

Because the death investigation cases were so specific in terms of crime type, we created a comparison set of exoneration cases, in which the top charge was any one of the homicide charges included among the 151 death investigation cases (murder, manslaughter, and accessory to murder) or child abuse. We did not include child sex abuse cases in the comparison set. At time of analysis, there were 318 exoneration cases in which the top charge was child sex abuse, but death investigation evidence contributed to only one of them, an unusual case in which an expert described as a pathologist and medical examiner gave testimony that minimized the significance of the defendant's negative test for gonorrhea and also made remarks that associated gonorrhea with homosexuality ([Bernard Baran](#)). Therefore, including child sex abuse cases in the comparison set would distort the comparison more than inform it. Only three-tenths of a percent of the 318 child sex abuse exoneration cases are included in the 151 death investigation cases. By contrast, 10% of the 1,343 homicide (as defined above) exoneration cases are included in the death investigation cases, and 8 of the 13 (62%) child abuse exoneration cases are included in the death investigation cases.

The only exoneration cases in which the top charge was dependent adult abuse ([Joseph Pierre Rollin](#)) or patient abuse and neglect ([Willie Shaw](#)) were cases to which death investigation contributed.

This yielded a comparison set of 1,208 cases in which the top charge was homicide (as defined above) or child abuse, and death investigation did *not* contribute to the conviction.

The 151 exonerees in the death investigation cases lost a total of 1,837 years in prison, an average of 12.2 years per exoneree. That is less than the average of 14.6 years for exonerees in the comparison set.

B. CROSS-NATIONAL COMPARISON

Of the four international exoneration registries, only Canada's identifies death investigation cases.⁶⁵ Death investigation contributed to 21 (almost one quarter) of the 89 known Canadian convictions that resulted in exoneration, five times the proportion for the US.⁶⁶ As noted in section III, many of these exonerations were exposed in the scandal over the work of one rogue death investigator in

⁶⁵ The other registries are: [China](https://perma.cc/2XZ3-TLY9) (<https://perma.cc/2XZ3-TLY9>), [Europe](https://perma.cc/QV88-65GU) (<https://perma.cc/QV88-65GU>), and the [United Kingdom](https://perma.cc/V9PR-PKS5) (<https://perma.cc/V9PR-PKS5>).

⁶⁶ <https://www.wrongfulconvictions.ca/data/all-case-data>, as of February 16, 2024, data sheet on file with the authors.

Ontario, and the Canadian legal system may have been particularly sensitive to problems in death investigation because of that scandal.⁶⁷

C. PRE-1989 EXONERATIONS

The Registry maintains a separate database of cases in which the exoneration occurred before 1989, the date of the first DNA exoneration in the US and the unofficial advent of the “modern” innocence movement. We discuss these cases separately because we have less information about them and because they are arguably less relevant to today’s criminal legal system. Death investigation contributed to five pre-1989 exoneration: [Thomas Davis](#) (convicted 1969), [Sammie Garrett](#) (convicted 1970), [Chester Holliday](#) (convicted 1981), [Robert Lee Kidd](#) (convicted 1960), and [Walter Pecho](#) (convicted 1954).

V. ANALYSIS

A. TYPE OF EVIDENCE

We assigned each of the 151 cases to one and only one of six “types” of evidence. These included, of course, the two “classic” responsibilities of death investigation: (1) *cause of death* and (2) *manner of death*.

In addition, (3) *Time of death* is a similarly “classic” question posed death investigators. Likewise, (4) *toxicology*, the measurement of poisons in the bodies of deceased persons, is another “classic” topic upon which death investigators are expected to opine.⁶⁸

However, much death investigation evidence concerned none of the above topics, but rather consisted of statements along the lines of “the wound was consistent with being made by the knife found in the impacted person’s possession.” We labelled this common evidence type (5) *evidence consistent with prosecution theory*.

Finally, in a small number of cases death investigators gave evidence about (6) *bitemarks*, a topic that is arguably not even within the proper domain of the death investigator.

We coded cases according to the evidence that mattered in convicting the defendant. So, for example, if a case contained evidence on both manner and cause of death, but the manner of death (e.g., homicide) was undisputed and the cause of death (e.g., a shotgun vs. a handgun) was disputed, we coded the evidence type as *cause of death* because it was the *cause of death* evidence that most contributed to the conviction.

The frequency of evidence types is shown in Table 2. In the next sections, we discuss each type in turn.

⁶⁷ Goudge, *Inquiry into Pediatric Forensic Pathology in Ontario*.

⁶⁸ James R. Gill, *Practical Toxicology for the Forensic Pathologist*, in *Forensic Pathology Reviews* 243-269 (Tsokos ed., 2005).

Table 2. Frequency of evidence type in death investigation cases.

Type of Evidence	Number of cases
Evidence consistent with prosecution theory	58
Cause of death	56
Time of death	17
Manner of death	16
Bitemarks	4
Grand Total	151

1. MANNER OF DEATH

Manner of death is perhaps the clearest cut of all the evidence types. The categories of manner are determined and required by public health authorities for death certificates in service of record-keeping and statistical purposes (not for criminal proceedings). The possible determinations are limited and legally determined by law. Determination of manner of death contributed to 16 false convictions. These usually involved contestation between the litigants over whether the death was homicide or something else, such as suicide, accident, or natural. The most common alternative cause was suicide. For example, in the conviction of [Richard Dzubiak](#) in Minnesota for manslaughter of his mother, May Speiser, in 1987,

A Ramsey County medical examiner performed an autopsy and concluded that the death was a homicide caused by a blow to the head with a blunt object. The examiner found that the woman’s injuries were consistent with a fall down a flight of stairs. Dziubak was charged with the woman’s murder after the medical examiner found a note tucked in the woman’s underwear that said, “Dick killed me—threw me down the basement.” The autopsy also showed an elevated level of anti-depressants in the woman’s blood, but after a defense expert concluded that the levels were not sufficiently high enough to have contributed to the woman’s death, Dziubak accepted an offer from the prosecution to plead guilty.⁶⁹

Dzubiak was sentenced to 6 years in prison. Post-conviction,

Another expert, Dakota County coroner Dr. John Plunkett, re-examined the autopsy and toxicology reports and saw that Speiser had approximately 100 times the recommended dosage of Amitriptyline, an anti-depressant, in her blood. Speiser died, Plunkett concluded, of a massive drug overdose.

At Dzubiak’s second trial in 1989,

A defense expert . . . testified that the massive amount of Amitriptyline was the result of an intentional overdose.

Dzubiak’s attorney

⁶⁹ All indented passages reproduce portions of the Registry’s story about the relevant case.

argued that based on the medical testimony, a woman who had suffered a fatal head injury would not have been able to write the note that was found.

Dzubiak was acquitted.

Other alternate manners, such as accident, could be invoked as well, such as in the conviction of [Rosa Jimenez](#) for murder in Texas in 2005. Twenty-one-month-old Bryan Gutierrez had been in Jimenez's care when he suffocated on a wad of paper towels. He suffered brain damage and later died. Jimenez claimed Bryan had swallowed the wad of paper towels, but the prosecution contended she had stuffed it down his throat. In addition to testimony from other doctors, board-certified forensic pathologist

Dr. Elizabeth Peacock, Travis County deputy medical examiner, testified that the cause of death was damage to the brain due to lack of oxygen. Peacock did not perform the autopsy, but after reviewing the autopsy report, she agreed the death was a homicide. It was "not a close call," she said. Asked to explain if a 21-month-old child could put such a large object into his airway, she said that "the physics of it are impossible."

Dr. Peacock said that the back of a child's mouth narrows to an opening less than an inch in diameter. She said it would be possible for an adult to force a large object down a child's throat.

Jimenez was sentenced to life in prison. After conviction,

Dr. Karen Zur, a pediatric otolaryngologist, and Dr. John McCloskey, a pediatric anesthesiologist and critical care specialist, both testified, and Dr. Janice Ophoven, a pediatric forensic pathologist submitted an affidavit. All three questioned the reliability of the conclusions offered by the State's experts at trial and testified that Bryan's injury was likely due to an accidental choking.

A "Consensus Statement" presented by the defense . . . from four leading pediatric otolaryngologists, concluded that Bryan's death was an accident. Among the conclusions by this team of experts: the gag reflex, which the prosecution's trial experts claimed would have prevented Bryan from ingesting the wad of papers, in fact would pull the wad further into the child's throat. . . .

An affidavit from Dr. Peacock [said] that she now believed "it is possible that [Bryan's] death was accidental." Dr. Peacock said she recognized the "specialization and expertise" of the authors of the Consensus Statement "in blocked airways of children and the biological mechanisms at play in pediatric airway blockage situations."

Jimenez was exonerated in 2023. She had served 15 years in prison.

2. CAUSE OF DEATH

In addition to assigning deaths to one of the preset categories of manner of death, death investigators are often asked to opine on cause of death—the disease or injury that initiated the fatal sequence of events independent of the manner of death.

Cause of death determinations contributed to 56 false convictions that later resulted in exoneration, far more than manner of death. This may be because there is a greater variety of possible cause of death determinations and they are more likely to be contradicted (see section V.K.1). Cause of death determinations are more precise predictions: one out of countless possible causes versus one of only a handful of manners of death. For example, in the conviction of [Rodricus Crawford](#) for the murder of his son, Roderius, in Louisiana in 2013,

Dr. James Traylor, Jr., a [board-certified forensic] pathologist from the University Health Center at Louisiana State University, performed an autopsy and discovered hemorrhaging on the boy's buttocks, which he said resulted from blunt force trauma. He also observed 12 separate contusions to the child's body, including seven on his forehead. Traylor said the child's death was a homicide due to smothering. After examining slides of the child's lung tissue, Traylor discovered that Roderius was suffering from bilateral early bronchopneumonia, which was present in all five lobes of his lungs. The bronchopneumonia, in Dr. Traylor's opinion, was insufficient to have caused the boy's death.

The defense called Dr. Daniel Joseph Spitz, a forensic pathologist and chief medical examiner for two counties in Michigan, as well as an assistant professor of pathology at Wayne State University, a clinical educator at Michigan State University, and a private consultant. Spitz testified that Roderius was "not a healthy child," and was coughing, wheezing, and had a runny nose.

Spitz told the jury Roderius "died as a result of ... bilateral bronchopneumonia" that caused the child to become septic and die "of those infectious complications."

Spitz also noted that a streptococcal infection was present in the blood, which indicated that Roderius "was, in fact, septic as a result of this infection." That condition "can cause significant cardiovascular consequences." Spitz said it was "implausible" to conclude that Roderius "just happened to be smothered in some untoward fashion."

After Crawford was convicted and sentenced to death, other medical experts agreed "that Roderius was the victim of bronchopneumonia." Crawford was exonerated in 2017.

3. TIME OF DEATH

Time of death can be a crucial issue in investigating murders, but death investigators acknowledge it is an inexact science. Seventeen false convictions that later resulted in exoneration hinged on time of death estimates. For example, [Kirstin Lobato](#) was convicted and sentenced to 40 to 100 years in prison in 2002 of the murder of a man, Duran Bailey, who was found in a dumpster in Las Vegas. At the preliminary hearing, Dr. Larry Simms, a board-certified forensic pathologist, testified that he estimated Bailey was killed about 12 hours prior to the discovery of the body at 10

p.m., on July 8, 2001. At trial, however, Simms testified that Bailey's death could have occurred as much as 18 hours prior to discovery.

Time of death was crucial because Lobato had an alibi beginning 12 hours before 10 p.m. on July 8—she was in Panaca, Nevada, 170 miles from Las Vegas.

Lobato was convicted, but the conviction was reversed. In 2006, Lobato was tried a second time, and this time

Dr. Simms testified and told the jury that death could have occurred 12 to 18 hours before 3:50 a.m. on July 9, 2001, when Bailey was officially pronounced dead.

Lobato was convicted of involuntary manslaughter and sentenced to 13 to 45 years in prison.

Although time of death is most commonly estimated by death investigators, forensic entomologists have long contended that entomology can offer more accurate time of death estimates in some cases.⁷⁰ Lobato's conviction was a rare one in which entomological expertise was introduced post-conviction to rebut a pathological estimate of time of death in affidavits by forensic entomologist Gail Anderson

and two other forensic entomologists—Dr. Jeffrey Tomberlin and Dr. Robert Kimsey. The experts all testified that they had independently concluded that based on the weather conditions in Las Vegas on July 8, 2001, and based on the outdoor location where Bailey's body was found, they would have expected to see his body covered with blowfly eggs shortly after his death.

The experts testified that blowflies arrive very shortly after death and lay hundreds of easily observable eggs in a freshly dead body's orifices and wounds. Given that Bailey's body had no blowfly eggs on it, the experts concluded that he died close in time to when his body was discovered around 10 p.m. on July 8—a time when Lobato was three hours away with her family in Panaca.

Dr. Andrew Baker, a forensic pathologist, also testified that based on the recorded rigor mortis changes in Bailey's body between when his body was discovered and when his autopsy was conducted, he likely died during the early evening hours of July 8, 2001.

Lobato was exonerated in 2017.

In another case, time of death was estimated with a pinpoint accuracy that another expert considered unwarranted considering how decomposed the body was. [Alan Gell](#) was convicted of murder in North Carolina in 1998. The victim, Allen Ray Jenkins, had been found on April 14, 1995. At trial, board-certified forensic pathologist M.E.F. Gilliland testified

that, in light of the decomposition of Jenkins's body, it was likely that he died around April 3.

⁷⁰ E.g., M. Lee Goff, *A Fly for the Prosecution* (2000).

The date of death was very important because Gell had been either traveling or in jail for petty crimes for much of the first two weeks of April, and could only have committed the murder on that one day. A jury found him guilty, and he was sentenced to death on March 3, 1998.

Gell's conviction was reversed, and he was tried a second time in 2004. At that trial,

A doctor . . . testified that, due to the high temperature in the house when Jenkins was found, his body would have decomposed quickly, and he could easily have died on a later date.

Gell was acquitted.

4. EVIDENCE CONSISTENT WITH PROSECUTION THEORY

The most common form of death investigation evidence involved in false convictions, however, was not the “classic” pathological tasks of determining manner, cause, or time of death. Instead, most commonly, death investigators simply made statements that were vague enough that they could be interpreted as consistent with the prosecution theory of the crime. In many cases, they could also be interpreted as consistent with the defense theory of the crime. In other words, the evidence was weak, or, in technical terms, relatively undiscriminating. However, since death investigators were usually state witnesses, the evidence was often elicited in a manner that emphasized its consistency with the prosecution theory while eliding its consistency with the defense theory. This could cause the factfinder to interpret the evidence as probative of guilt. This type of evidence appeared in 58 cases, more than a third of the 151 cases. These statements could range from relatively innocuous statements that probably only modestly bolstered the prosecution theory of the crime to extremely powerful statements. For example, the death investigation evidence in the conviction of [Paul Browning](#) for murder in Las Vegas in 1986 supported the prosecution's theory, but probably did not prop up that theory on its own:

Dr. Giles Green, a [board-certified] forensic pathologist, had conducted the autopsy. . . . Green was asked if the knife recovered under the stairs, which did not have any blood on it, could have made the wound. “The wound that we have in the body of Mr. Elsen [the victim] could have been made by this or any other knife with that size and shape,” Green said. “There is nothing about that knife that tells me that that knife made those wounds. The wound could have been made by that knife or one that I happen to own that is very much like it.”

Browning was exonerated, based on exculpatory evidence that had been concealed by prosecutors and ineffective assistance of counsel, in 2020.

At the other end of the spectrum, consider the evidence in the conviction of [Santiago Ventura Morales](#) for murder of Ramiro Lopez Fidel in 1986 in Oregon:

Despite considerable blood that spurted from the wounds, a laboratory examination found no traces of blood on Morales' knife. State deputy medical examiner Dr. Karen Gunson testified that as Morales pulled out the knife, Fidel's fat tissue wiped it clean.

Eventually, an expert hired by a lawyer who took Morales post-conviction case pro bono said that the idea of a knife coming out clean from a wound because of fat tissue was "contradictory, misleading, incomplete and incorrect."

Morales was exonerated in 1991.

At the time of Morales's trial, Gunson was board certified in anatomic and clinical pathology, but not forensic pathology. However, she received her board certification in forensic pathology in 1988, two years after Morales's conviction and three years before his exoneration.

5. BITEMARKS

In four cases, death investigators contributed to false convictions by claiming to detect bitemarks on cadavers. In no case did a death investigator claim to identify the source of the bitemark. But in two cases a forensic odontologist subsequently did claim to identify the source of the bitemark. Those two cases involved the same pathologist, Steven Hayne, and the same forensic odontologist, Michael West.⁷¹ One of those case was the conviction of [Kennedy Brewer](#) for murder in Mississippi in 1995.

The medical examiner who conducted the autopsy, Steven Hayne, testified that he had found several marks on the child's body that he believed to be bitemarks. Hayne called in Dr. Michael West, a forensic odontologist, to analyze the marks. West concluded that 19 marks found on the victim's body were "indeed and without a doubt" inflicted by Brewer. He further asserted that all 19 marks were made only by Brewer's top two teeth and that somehow the bottom teeth had made no impression.

In response, the defense introduced Dr. Richard Souviron, a licensed dentist and founding member of the American Board of Forensic Odontology, who testified that the marks were not human bitemarks at all but were insect bites that the body sustained from being left in the water for days. Souviron argued that it would be all but impossible to leave repeated bitemark impressions with only the top two teeth.

Brewer was exonerated by post-conviction DNA testing, which then also unraveled the other false conviction in which Hayne identified a bitemark and West claimed to identify its source, that of [Levon Brooks](#).

B. DEMOGRAPHICS

1. GENDER

⁷¹ Balko & Carrington, *The Cadaver King and the Country Dentist*.

Women were overrepresented among the defendants for whom death investigation contributed to their false conviction. One quarter (39) of the defendants in the 151 cases were female. By comparison, only around 8% of all exonerees are female, and only around 5% of the comparison set of exonerees are female.⁷² Put another way, death investigation contributed to the false convictions of 14% (39/287) of all exoneration cases with female defendants, but only 4% (112/3,105) of exoneration cases with male defendants.⁷³

2. CHILD VICTIMS

The high proportion of female exonerees in death investigation cases is not surprising because death investigation contributed to a high proportion of child death cases, including, but not limited to, SBS cases. The high number of women involved in SBS cases has long been understood, but we find that cases with child victims constitute a disproportionate share of exoneration cases involving death investigation, even aside from SBS. Of the 151 false convictions to which death investigation contributed, nearly half (71) involved child victims. That compares to only 19% of all non-DI exoneration cases and 17% of the comparison set cases.⁷⁴ Of the 71 death investigation cases involving a child victim, one third (23) of them involved a female defendant.

When infants and children die unexpectedly, suspicion tends to fall on the last caregiver, and, given persisting American gender roles, those caregivers are disproportionately women.⁷⁵ In addition, child deaths are sometimes difficult to explain when there is often little evidence.⁷⁶ Communication prior to death may have been difficult or impossible. Death investigators may be called upon to offer explanations more often, and prosecutions may rely more heavily on those recommendations.

3. RACE

As shown in Figure 3, the exonerees in death investigation exoneration cases were whiter than exonerees falsely convicted of comparable crimes, in which death investigation did not contribute. One third of death investigation exonerees were Black compared to 56% of exonerees in the comparison set. Similarly, 8% of death investigation exonerees were Hispanic, compared to 13% of the comparison set.

⁷² 248 of the 3,241 non-DI exonerees in the Registry (as of October 5, 2023). This rate that has been consistent through almost the entire life of the Registry. Kaitlyn Jackson & Samuel Gross, *Female Exonerees: Trends and Patterns*, National Registry of Exonerations, (Sept. 27, 2014), <https://www.law.umich.edu/special/exoneration/Pages/Features.Female.Exonerees.aspx> (<https://n2t.net/ark:/88112/x2js6n>).

⁷³ See also Elizabeth Webster & Jody Miller, *Gendering and Racing Wrongful Conviction: Intersectionality, Normal Crimes, and Women's Experiences of Miscarriage of Justice*, 78 Alb. L. Rev. 973, 992 n. 119 (2014).

⁷⁴ 71/151 death investigation cases involve child victims. 619 of 3,241 non-DI cases involve child victims. 200/1,208 cases in the comparison set in which death investigation contributed had child victims.

⁷⁵ Jessica S. Henry, *Smoke, But No Fire: Convicting the Innocent of Crime that Never Happened*, 25 (2020); Jackson & Gross, *Female Exonerees: Trends and Patterns*; Webster & Miller, *Gendering and Racing Wrongful Conviction*, 990. Nor is the phenomenon confined to the United States. See Emma Cunliffe, *Murder, Medicine and Motherhood* (2011).

⁷⁶ Goudge, *Inquiry into Pediatric Forensic Pathology in Ontario*, 4.

For comparison purposes, the right column of Figure 3 shows the racial composition of the population of people in prison for homicide.⁷⁷

Registry studies have already established that the proportion of people falsely convicted of murder who are Black exceeds the proportion of people imprisoned for murder who are Black.⁷⁸ However, this is not true for false convictions to which death investigation contributed.

The proportion of people falsely convicted of murder who are Hispanic is lower than the proportion of people imprisoned for murder who are Hispanic. The people for whom death investigation contributed to the false conviction who are Hispanic is lower still.

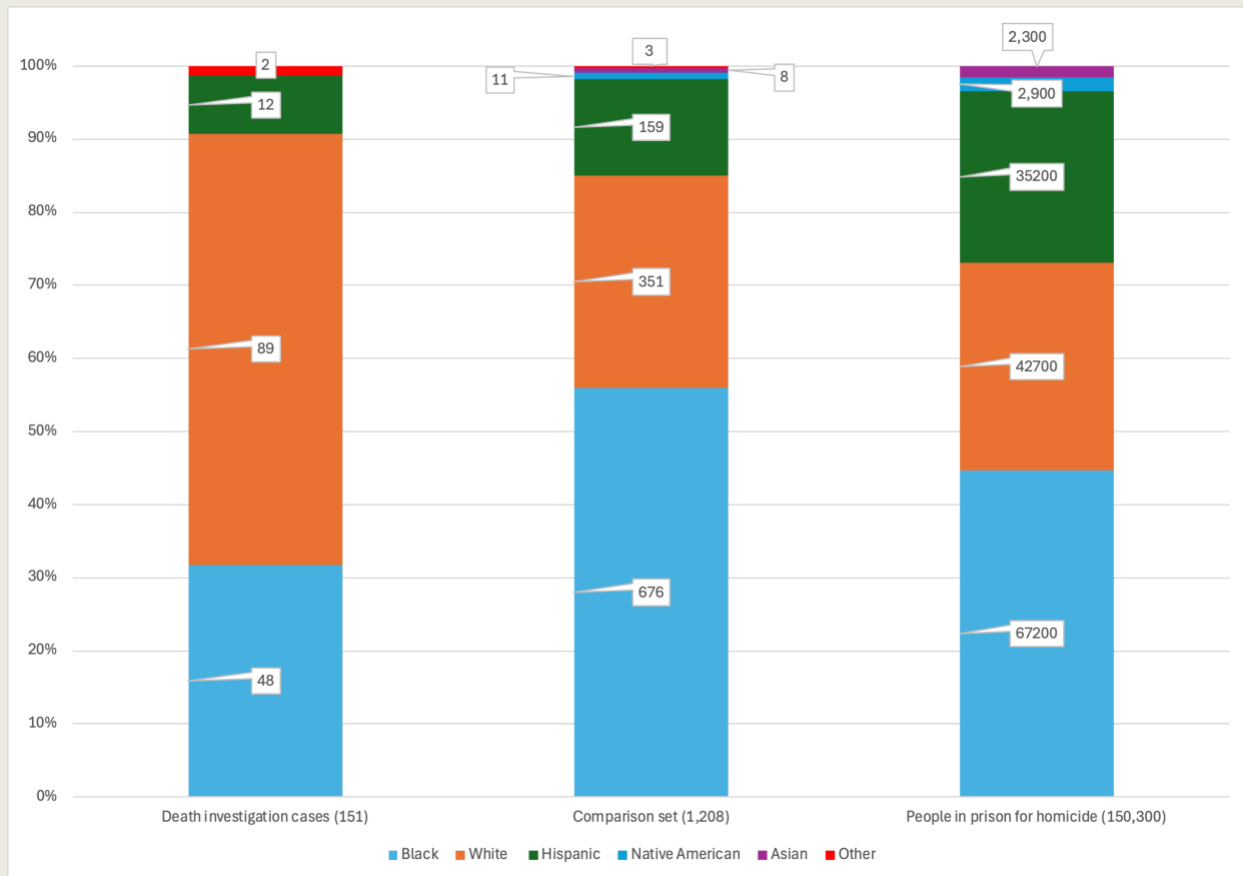


Figure 3. Race of exonerees in cases to which death investigation contributed, cases to which it did not contribute, involving comparable crimes, and the US population of people in prison for homicide. Column totals are shown in

⁷⁷ E. Ann Carlson & Rich Kluckow, *Prisoners in 2022 – Statistical Tables*, Bureau of Justice Statistics, Tables 17, 20 (Nov., 2023), <https://bjs.ojp.gov/document/p22st.pdf> (<https://perma.cc/4LAE-J3EV>). It was not possible to match the death investigation cases or the comparison set to the Bureau of Justice Statistics data because it does not include the abuse of vulnerable persons crimes. Given that 91% of the death investigation cases were homicides, we simply compared the death investigation exonerations and the comparison set to the BJS data for homicides. The data shown in the rightmost two columns of **Error! Reference source not found.** include sentenced prisoners under the jurisdiction of state correctional authorities for murder and negligent manslaughter on December 31, 2021, and sentenced federal prisoners held in Bureau of Prisons or privately operated correctional facilities for homicide on September 30, 2022.

⁷⁸ Samuel R. Gross et al., *Race and Wrongful Convictions in the United States 2022*, National Registry of Exonerations, 4 (Sept., 2022), <https://n2t.net/ark:/88112/x22s5x>.

parentheses. Source: Bureau of Justice Statistics, <https://perma.cc/4LAE-J3EV>. The BJS does not use “Other” as a racial category.

The higher representation of whites diminishes slightly if women are removed from the analysis (Figure 4). Forty-two male death investigation exonerees were Black, 38% of all male death investigation exonerees, whereas only six female death investigation exonerees were Black, 15% of all female death investigation exonerees.

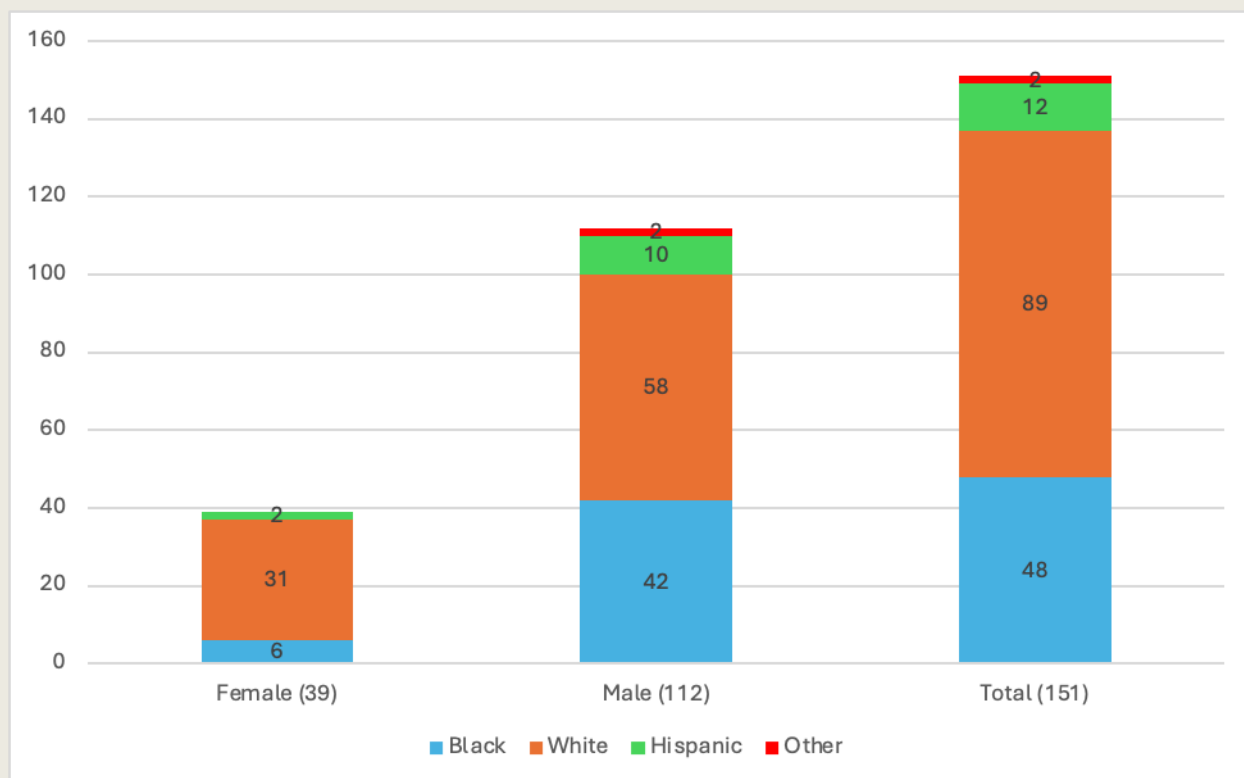


Figure 4. Race and sex of death investigation exonerees. Column totals are shown in parentheses.

Similarly, the higher representation of white defendants was slightly less pronounced in cases involving child victims (Figure 5). Again, this effect was to a significant extent driven by female defendants. Cases involving child victims and male defendants had an equal number of white and Black defendants. (We see the same pattern in the subset of child victim cases that involve the SBS diagnosis [Figure 20].) But in child victim cases involving female defendants, sixteen (70%) of the defendants were white. This suggests that Black men are especially vulnerable to false conviction in cases involving child victims, possibly because of stereotypes about neglect and abuse of Black children.⁷⁹

⁷⁹ Kimberly M. Bernstein et al., *Racial Stereotyping and Misdiagnosis of Child Abuse*, 51 *Monitor on Psychology* (2020) <https://www.apa.org/monitor/2020/07/jn>. See also Cynthia J. Najdowski & Kimberly M. Bernstein, *Race, Social Class, and Child Abuse: Content and Strength of Medical Professionals’ Stereotypes*, 86 *Child Abuse & Neglect* 217 (2018); Modupeola Diyaolu et al., *Disparities in detection of suspected child abuse*, 58 *Journal of Pediatric Surgery* 337 (2023) <https://doi.org/10.1016/j.jpedsurg.2022.10.039>.

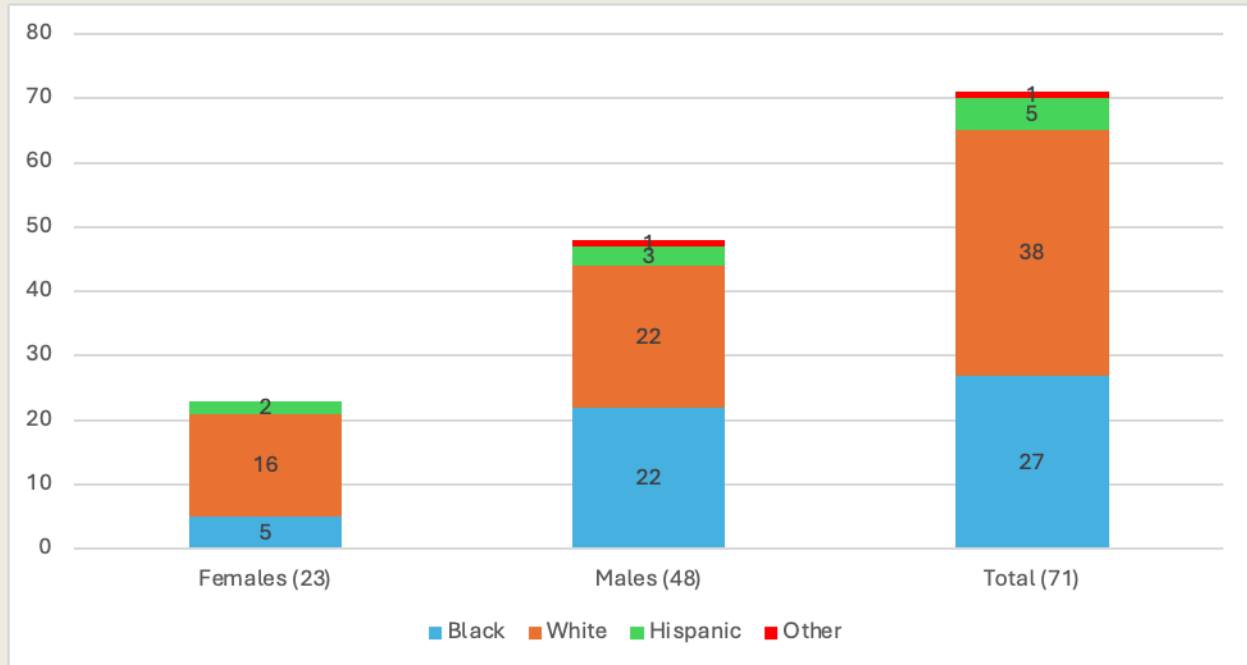
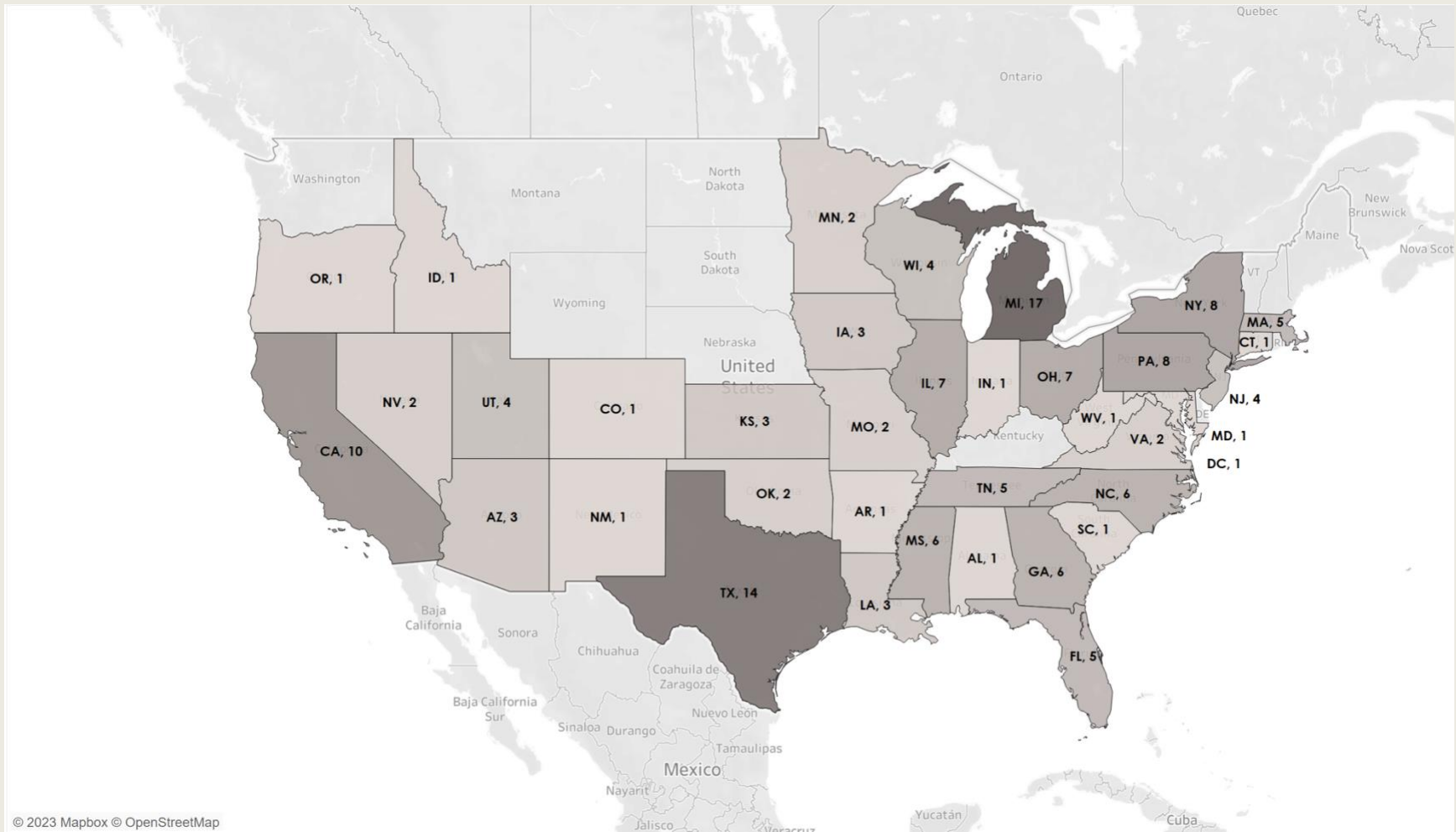


Figure 5. Race and sex of death investigation exonerees in cases involving child victims. Column totals are shown in parentheses.

C. GEOGRAPHY

Death investigation contributed to exonerations across the United States—in 38 of the 50 states and the District of Columbia (Figure 6). The distribution tends to follow the distribution of exonerations in general. Apparent clusters of death investigation cases are inflated by multi-defendant cases, most notably in Michigan, where there were several multi-defendant cases including a four-defendant case centered around [Laurie Moore](#).



© 2023 Mapbox © OpenStreetMap

Figure 6. Location of death investigation exoneration cases (n=151)

D. TEMPORAL TRENDS

Exonerations in cases to which death investigation contributed have been increasing since 1989. However, as shown in Figure 7, this trend is not specific to death investigation; it reflects that exonerations for comparable crimes (homicide and child abuse) have been increasing.

DEATH INVESTIGATION AND WRONGFUL CONVICTION



Figure 7. Year of exoneration in death investigation cases compared to the comparison set of homicide and child abuse cases, through 2022. Because analysis was done in 2023, data for that year is incomplete, and it is not shown. Data shown in Table 5.

DEATH INVESTIGATION AND WRONGFUL CONVICTION

In contrast, death investigation cases diverge from the comparison set with regard to the year of conviction. As shown in Figure 8, the proportion of all exonerations in homicide and child abuse cases to which death investigation contributed has increased from around 6% of all homicide and child abuse exonerations for cases tried in the 1970s to around 21% for cases tried more recently. This suggests that over time death investigation has played an increasingly important role in investigating and trying cases that later result in exoneration.

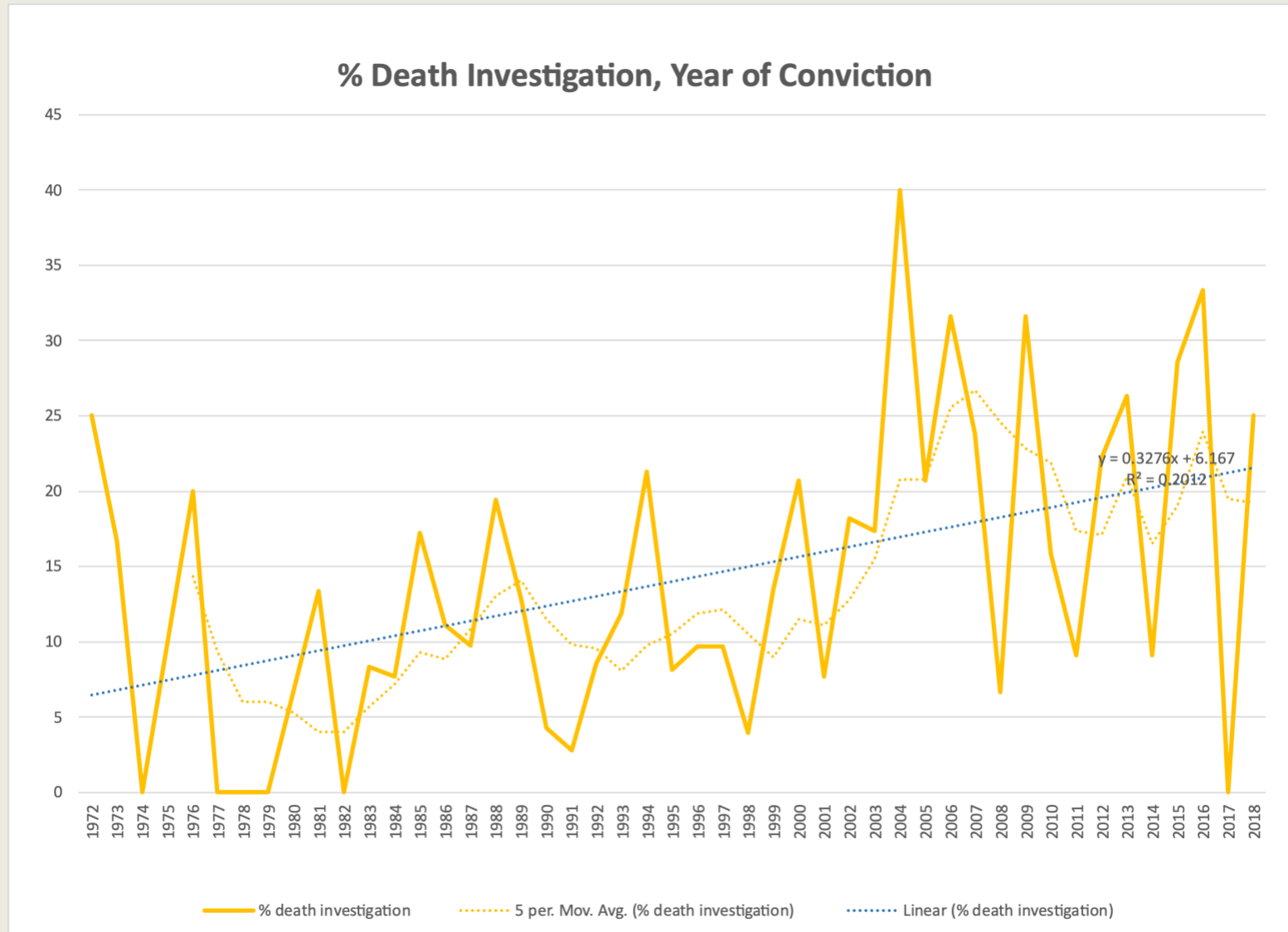


Figure 8. Five-year moving average of percentage of all homicide and child abuse cases to which death investigation contributed, from 1972, the earliest year of conviction for a death investigation case, through 2018, the latest year of conviction for a death investigation case. Data shown in Table 6.

E. DEATH INVESTIGATION SYSTEMS

As discussed above, death investigation in the US occurs in a patchwork of different systems. Using data from Centers for Disease Control and Prevention (CDC) Collaborating Office for Medical Examiners and Coroners, we were able to explore in which of these various systems the 151 cases occurred.

1. STATES

The CDC categorizes state death investigation systems of the 50 states and the District of Columbia into four general types:

1. county-based mixture of medical examiner and coroner offices;
2. county/district-based medical examiner offices;
3. centralized state medical examiner offices;
4. county/district-based coroner offices (Figure 1).⁸⁰

Figure 9 shows the distribution of death investigation exonerations across these four general types of state system, compared the number of states using that type of system and the proportion of the US population that lives under that general type of system. Note that Figure 9 refers to the system of the state, not the county. Thus, an exoneration that occurred in New York City, which has a medical examiner office, and another exoneration that occurred in an upstate New York county that has a coroner system would both be included among the 76 exonerations that occurred in the 14 states that have a “a county-based mixture of medical examiner and coroner offices” (colored blue in Figure 9).

Half of the exoneration cases occurred in states with a county-based mixture of medical examiner and coroner offices. A quarter occurred in states with only medical examiner offices, but those offices were county or district based. Around 17% occurred in states with centralized medical examiner officers, and around 9% occurred in states with only coroner officers. As shown in Figure 9, the distribution of exonerations among these groups of death investigation system type was generally consistent with the groups’ proportion of the US population.⁸¹ The most notable difference was that states with county or district-based medical examiners had a modestly disproportionately higher number of false convictions that later resulted in exoneration (colored orange in Figure 9), and states with coroner systems had a modestly disproportionately smaller number (colored purple in Figure 9). This may be surprising because medical examiner systems are generally perceived to be stronger, but states with only coroner systems tend to be smaller, more rural states. To learn more, we need to probe deeper into county-level, rather than state-level, data.

⁸⁰ <https://www.cdc.gov/phlp/publications/coroner/death.html> (<https://perma.cc/5UW9-DVQ9>)

⁸¹ All US population data in this report was sourced from Microsoft Excel and derived from the 2020 Census.

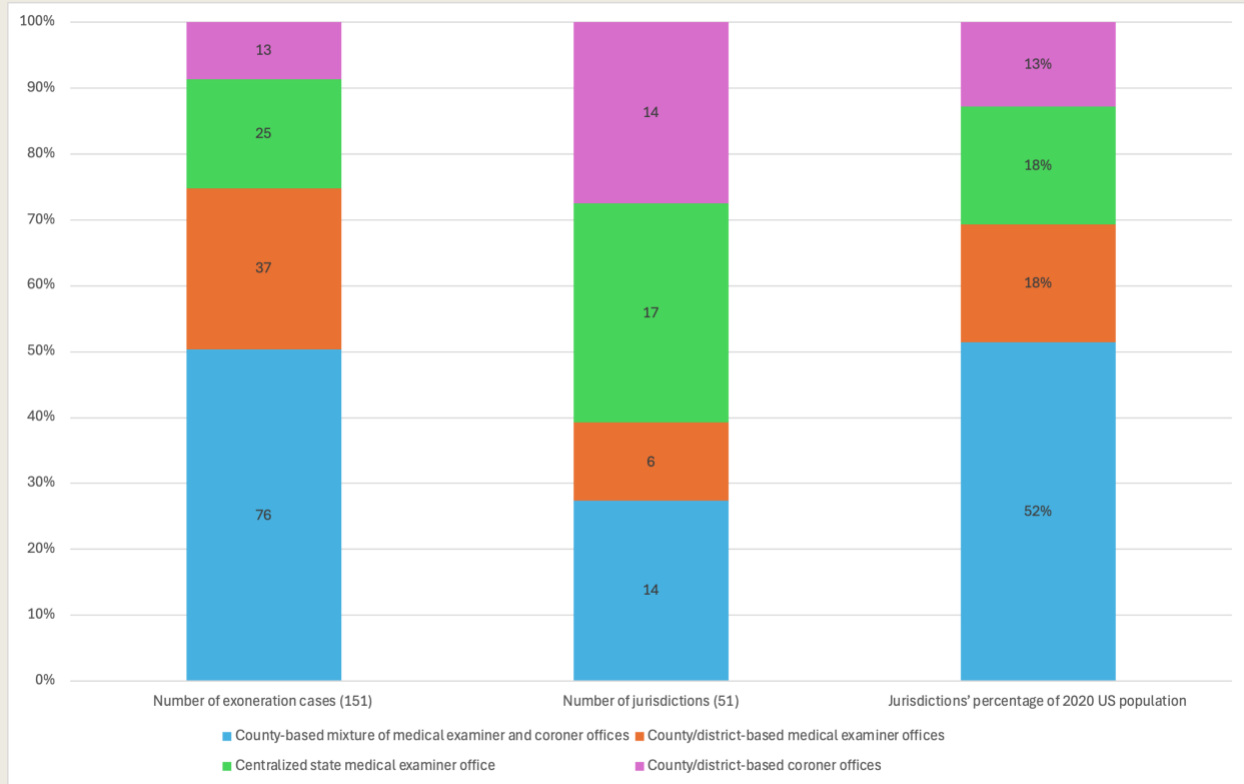


Figure 9. Exoneration cases by type of state (plus the District of Columbia) death investigation system. Column totals shown in parentheses. Source: Centers for Disease Control.

The disproportion in county/district-based medical examiner systems (shown in orange in Figure 9) derived primarily from county medical examiners, who appeared in 31 of the 37 cases (Table 3). Regional medical examiners appeared in the remaining 6, and state medical examiners contributed to none of the cases.

Table 3. Breakdown of the 37 exoneration cases that occurred in states with county/district based medical examiner offices. Source: Centers for Disease Control.

Row Labels	Count of Medical examiner system
County Medical Examiner	31
Regional Medical Examiner	6
Grand Total	37

Half of US states have a state medical examiner although a state medical examiner does not necessarily have jurisdiction over all death investigations in the state.⁸² According to the CDC, “Although the role of the state MEs [medical examiners] varies by state, in general, they provide oversight and standardization to” medicolegal death investigation.⁸³ As shown in Figure 10, around two-thirds of the 151 convictions that resulted in exoneration occurred in states without a state

⁸² <https://www.cdc.gov/phlp/publications/coroner/death.html> (<https://perma.cc/5UW9-DVQ9>).

⁸³ <https://www.cdc.gov/nchs/comec/Medical-Death-Investigation-System-by-County-12-19-2023.pdf> (<https://perma.cc/7FRE-9AAU>).

medical examiner. However, as also shown in Figure 10, this distribution is very close to the proportion of the US population represented by those states.

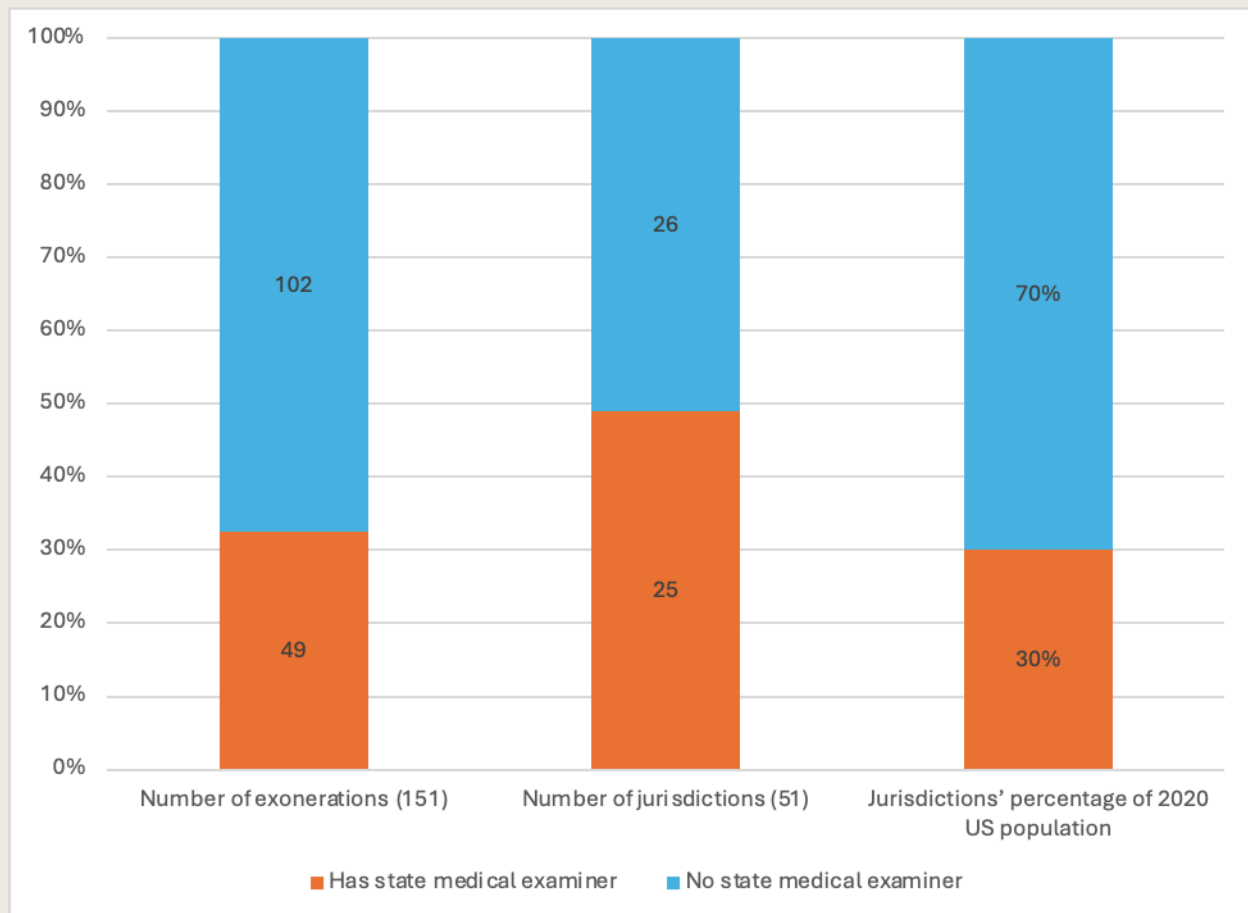


Figure 10. Exoneration by whether state had a state medical examiner. Source: Centers for Disease Control. Column totals are shown in parentheses.

2. COUNTIES

As should be clear from the preceding section, state-level information is of limited value because many states employ mixed systems with medical examiners in some counties and coroners in others. In many states, the death investigation system may be quite different in large urban counties than in small rural counties. This makes it important to consider county-level data.

More of the 3,143 US counties have coroner offices (49%) than medical examiner offices (36%). However, the counties with medical examiner offices are larger: they account for around 61% of the US population (Figure 11).

The CDC notes that death investigation systems in at least some counties in eight states are run by government officials who are neither medical examiners nor coroners. These “other officials” include County Attorneys, Justices of the Peace, and law enforcement officials, such as Sheriffs and Chiefs of Police. In one state (Nebraska), the County Attorney runs the death investigation system

in every county in the state. In the remaining 7 states, “other officials” only run the systems in some counties.⁸⁴

Sixty-two percent of convictions that resulted in exoneration occurred in counties with a medical examiner system. Twenty-nine percent occurred in counties with coroner systems, and nine percent occurred in counties run by an “other official.” As shown in Figure 11, these proportions correspond closely to the percentages of the US population that live under each type of system.⁸⁵

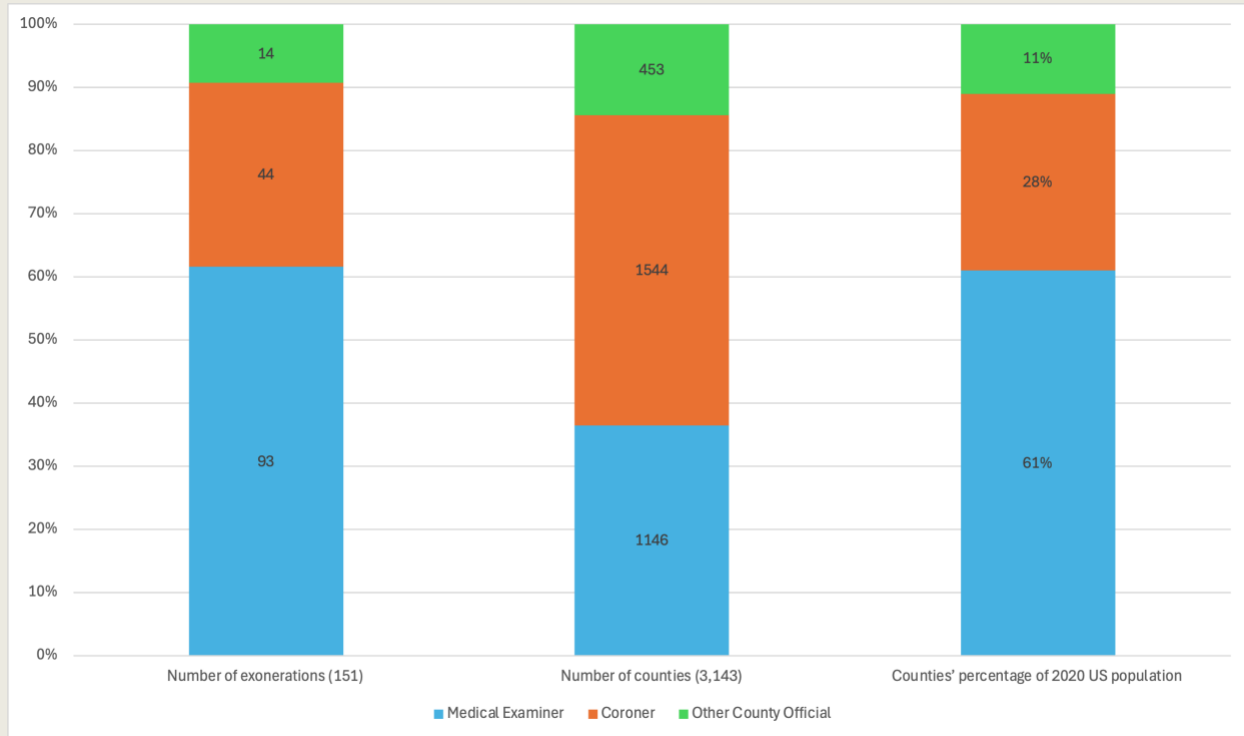


Figure 11. Exoneration cases by type of county death investigation system. Column totals shown in parentheses. Source: Centers for Disease Control.

While the population covered by different types of death investigation office is one measure of to how many false convictions that type of office should be expected to contribute, another measure is the number of cases handled by that type of office. The BJS compiles data on “cases accepted for further investigation,” but it diverges from its data on population covered: according to BJS, coroner offices cover 34% of the US population but handled 51% of death investigation cases.⁸⁶ Based on the BJS case acceptance data, Figure 12 suggests that coroner officers and state medical examiners contributed to fewer false convictions than expected in light of their portion of cases accepted. Local and regional medical examiner offices contributed to more than expected.

⁸⁴ <https://www.cdc.gov/nchs/comec/Medical-Death-Investigation-System-by-County-12-19-2023.pdf> (<https://perma.cc/7FRE-9AAU>). The seven states are: California, Hawaii, Montana, Nevada, New York, Texas, and Washington.

⁸⁵ The Bureau of Justice Statistics’s (BJS) calculations of the portions of the US population covered by different types of death investigation office differ from the CDC’s. The BJS reports 34% of the population covered by coroner offices, 45% by local and regional medical examiner offices, and 21% by state medical examiner officers. Unlike the CDC, the BJS does not include offices run by “other county officials.”

⁸⁶ Brooks, *Medical Examiner and Coroner Offices*, 2018, 1, 4.

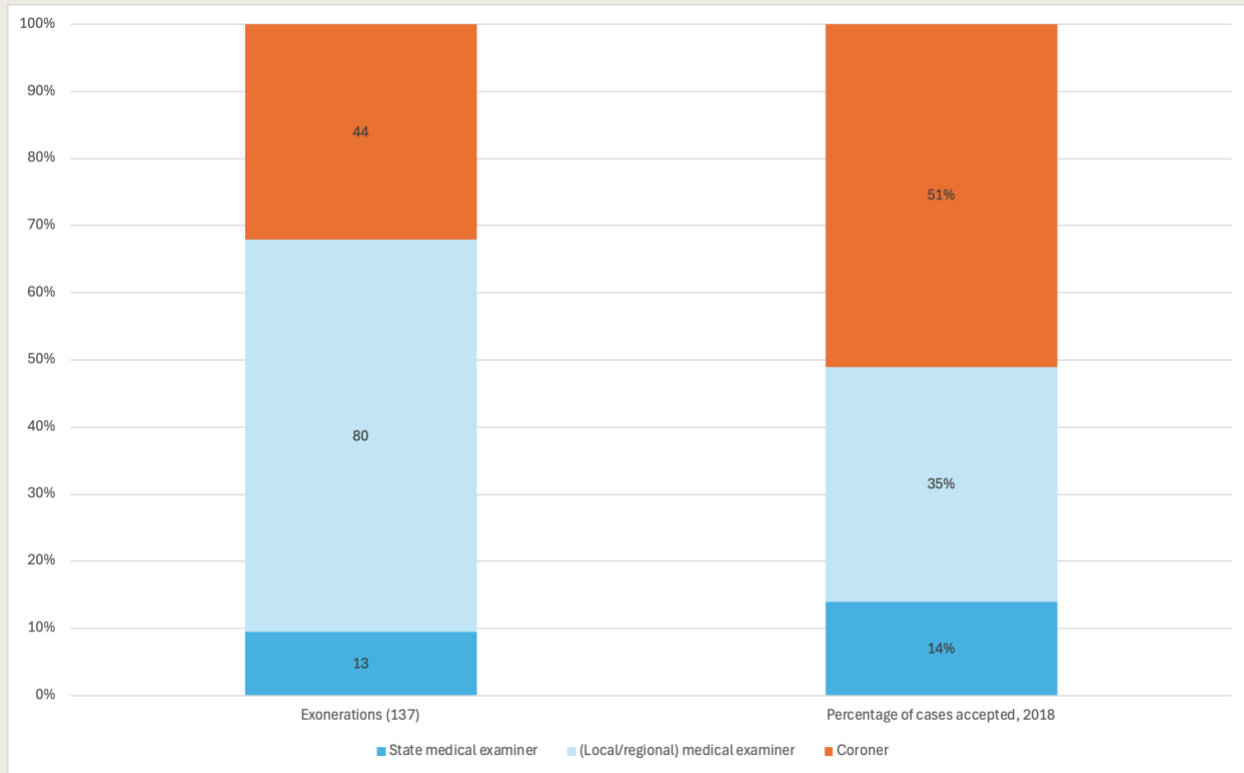


Figure 12. Exonerations and percentage of cases accepted compared by death investigation system. Exonerations occurring in counties with death investigation systems run by “other county officials” (see Figure 11) are excluded because BJS does not include them. Column total is shown in parenthesis. Source: Bureau of Justice Statistics.

a) Medical Examiner Systems

Of the 93 cases that occurred in counties with medical examiner systems, 73% occurred under the jurisdiction of a county medical examiner (Figure 13). The remaining 25 cases were divided nearly equally between those under the jurisdiction of a state medical examiner and those under the jurisdiction of a regional medical examiner. When these percentages are compared to those counties’ populations, however, we find that county medical examiners had a disproportionately high number of exonerations, and regional medical examiners had a disproportionately low number. One possible explanation for this finding is that county medical examiners are in closer contact with local enforcement, increasing the potential for pro-prosecution bias. State and regional medical examiners may have greater distance from the investigating law enforcement agencies. Another is that state and regional medical examiners will be in larger counties with more homicides and perhaps more likely to employ better qualified death investigators.

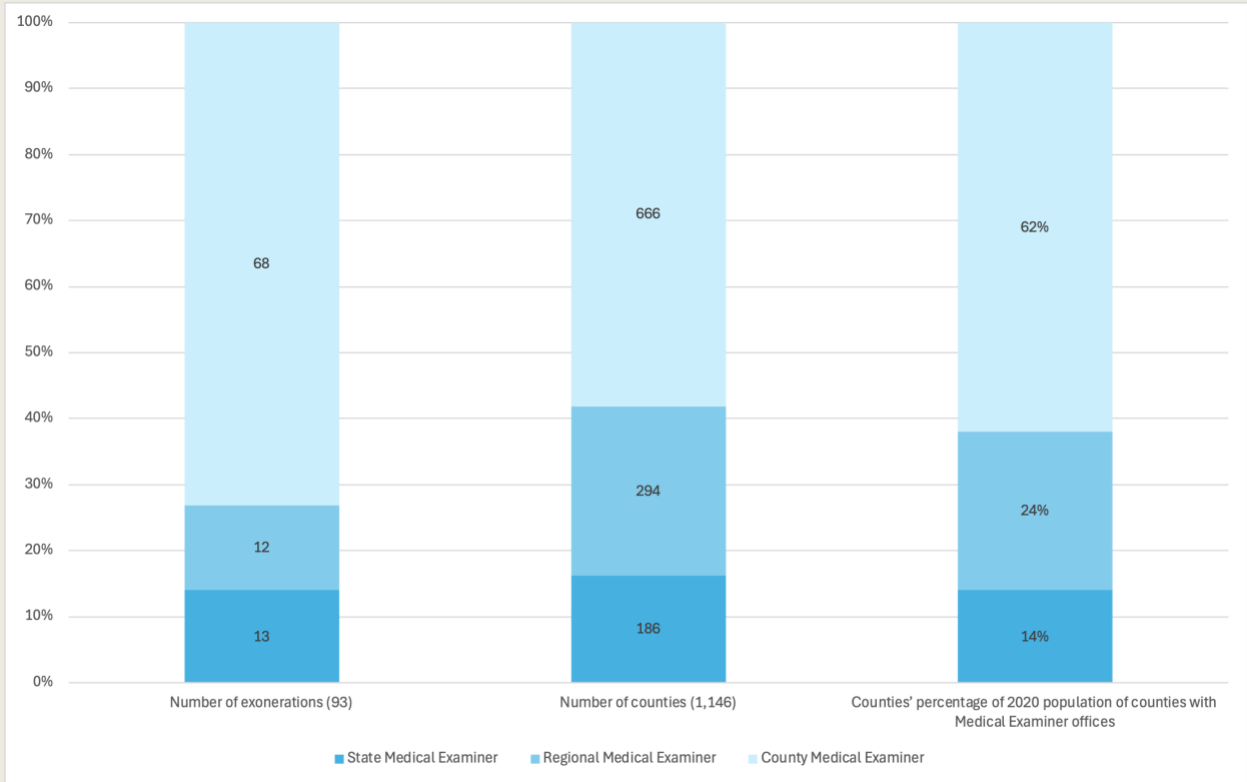


Figure 13. Exoneration cases that occurred under medical examiner systems, by type of medical examiner. Column totals are shown in parentheses.

b) Coroner Systems

Coroners can be elected or appointed, and the vast majority of them are elected. As shown in Figure 14, of the 44 convictions that later resulted in exoneration that occurred in counties with coroner systems, the overwhelming majority occurred in counties with elected coroners. This is consistent with the number of those counties and with those counties’ proportion of the population of counties with coroner offices.

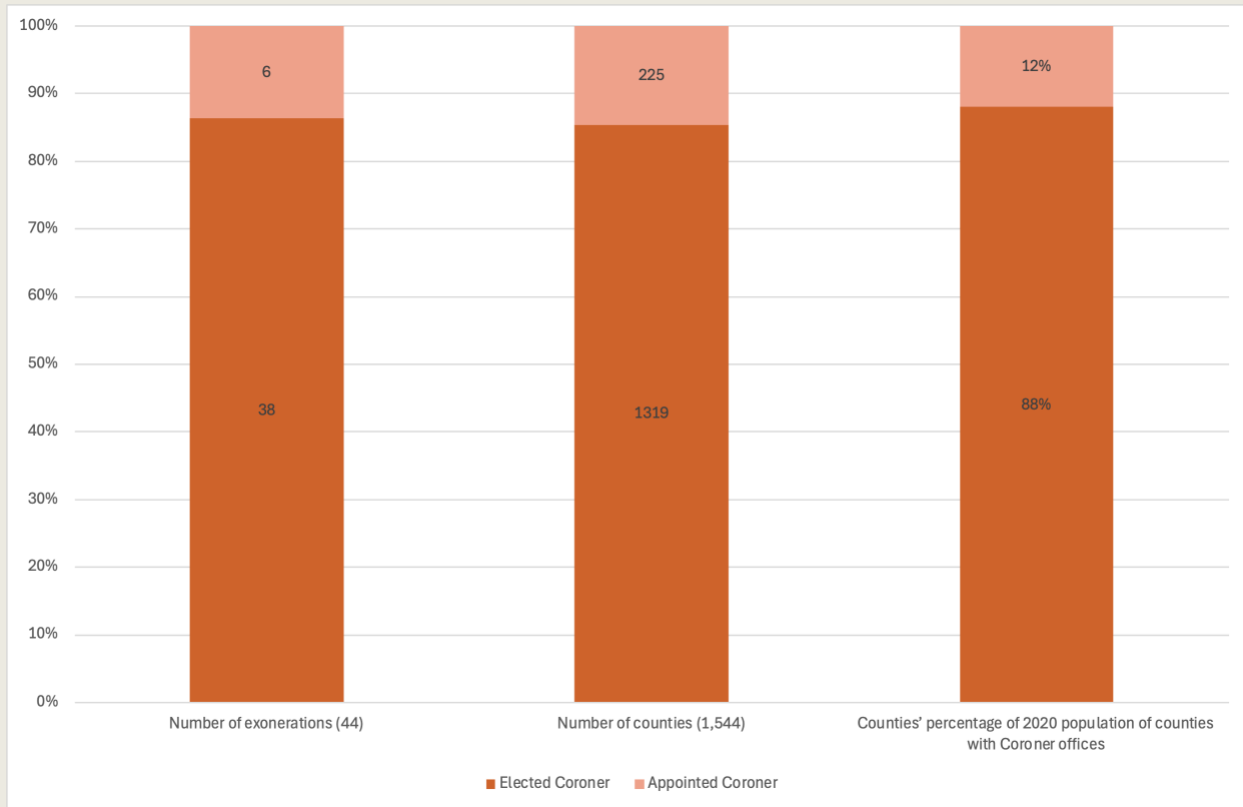


Figure 14. Exoneration cases that occurred under coroner systems, by type of coroner. Column totals are shown in parentheses.

c) “Other official” Systems

Figure 15 shows that of the 14 cases that occurred in counties where the death investigation system was run by an “other official,” in 8 of the cases (all from Texas) the system was run by a Justice of the Peace, and in 6 (5 from California, and 1 from Hawaii) the system was run by a law enforcement official. Although the numbers are too small to be given much weight, when compared to the populations of these counties, the Texas Justice of the Peace counties had a disproportionately high number of exonerations, and the counties run by law enforcement officials had a disproportionately low number. Death investigation did not contribute to any Nebraska exonerations, so the systems run by County Attorneys also had a disproportionately low number of exonerations.

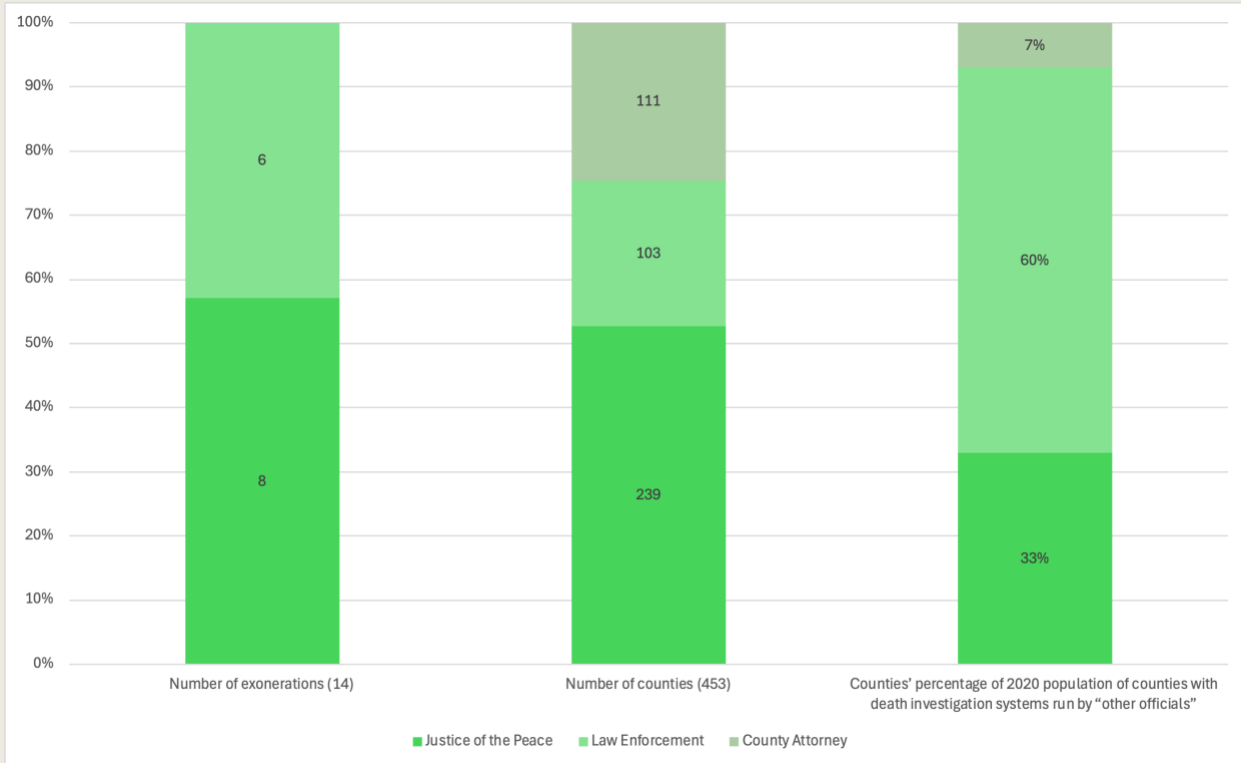


Figure 15. Exoneration cases that occurred in death investigation systems run by "other officials," by type of official. Column totals are shown in parentheses.

d) Elected Death Investigators

Around one third (51) of the 151 cases occurred under a death investigation system run by an elected official: 38 occurred under elected coroners plus 13 occurred under elected Justices of the Peace and Sheriffs.⁸⁷ This is almost precisely consistent with the fact that slightly more than one third of the US population lives in counties with death investigation systems run by elected officials, and slightly less than two thirds live in death investigation systems run by appointed officials (Figure 16).

⁸⁷ One exoneration occurred in a county with a death investigation system run by an unelected "other official." The death investigation system of the County of Hawaii is run by the Chief of Police, who is not elected. <https://www.cdc.gov/phlp/publications/coroner/hawaii.html> (<https://perma.cc/9PH3-9EDT>).

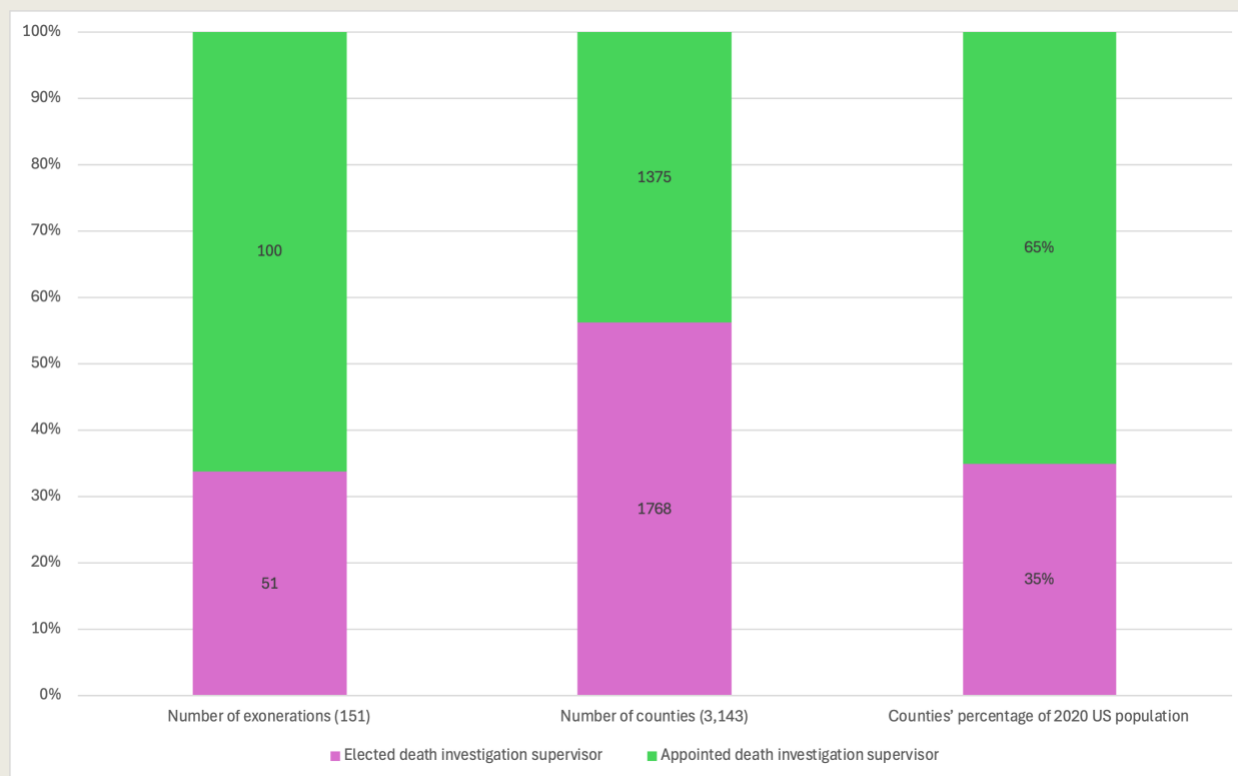


Figure 16. Exoneration cases by whether the county death investigation system is run by an elected official, with comparative population figures. Column totals are shown in parentheses.

F. ACCREDITATION

Death investigators argue that “Regardless of system type, death investigations should be conducted by accredited organizations.”⁸⁸ In 2015 the NCFS recommended “that the Attorney General of the United States approve a policy that recommends that all offices, facilities, or institutions performing government-funded official medicolegal death investigation activities, for medical examiner/coroner system, be accredited by the end of the year 2020.”⁸⁹

There are two recognized accrediting bodies for death investigation in the US: the National Association of Medical Examiners (NAME) and the International Association of Coroners & Medical Examiners (IACME). NAME accreditation is the older and more common of the two.

Some argue that accreditation offers reassurance that death investigation services are of high quality. For example, the NCFS asserted that “Accreditation demonstrates compliance with industry and professional standards and performance criteria and provides an independent measure of assurance to the tax-paying citizens of the community served.”⁹⁰

⁸⁸ Randy L. Hanzlick & John Fudenberg, *Coroner Versus Medical Examiner Sysytes: Can We End the Debate?*, 4 Academic Forensic Pathology 10, 16 (2014) <https://doi.org/10.23907/2014.002>.

⁸⁹ National Commission on Forensic Science, *Accreditation of Medicolegal Death Investigation Offices*, Recommendation to the Attorney General, 1 (Jan. 30, 2015), <https://www.justice.gov/media/962621/dl?inline>.

⁹⁰ Id., 2. See also James R. Gill & National Association of Medical Examiners Ad Hoc State Medical Examiner Committee, *State Medical Examiner Systems, 2013: Staffin, Autopsies, Strengths, Limitations, and Needs*, 4 Academic Forensic Pathology 24, 30 (2014) <https://doi.org/10.23907/2014.004>.

However, others argue that while “Accreditation is a good step to ensure minimal standards are being met, at least in the procedures and management systems adopted,” it “does not ensure that valid methods are used. Nor does accreditation ensure that reliable and consistent casework is being done, since it typically involves review of procedures and protocols but not casework.”⁹¹ NAME itself notes that its accreditation “standards emphasize policies and procedures, not professional work product.”⁹² The process involves completion of a checklist, a self-inspection, and an external inspection.⁹³ For some, this is inadequate: “NAME accreditation requires a quality-assurance program, but it does not specify the type of program. It merely requires a written policy or standard operating procedure that is scheduled and implemented regularly, with documentation of corrective action for identified deficiencies.”⁹⁴ Some death investigators assert, underwhelmingly, that NAME accreditation merely indicates that communities “are being provided with at least basic quality medicolegal death investigation.”⁹⁵

To investigate the role of accreditation in wrongful conviction cases to which death investigation contributed, we attempted to determine the names of the death investigation facilities involved in each case. Of the 151 cases discussed in this study, we determined a name for 129 (85%) of them. For the remaining 22 cases, either: (1) we were not able to determine the name of the facility from available records; or (2) no death investigation facility was involved in the case because the death investigation evidence was given by someone not employed by a death investigation facility, such as a non-pathologist physician (see section V.G.6) or a non-physician (see section V.G.7.).

In 29 of the 129 cases (22%), a facility that was NAME accredited at the time of the conviction contributed to the wrongful conviction. These 29 cases derived from 14 NAME accredited facilities.⁹⁶ Five of these cases were handled by the Cook County (Illinois) Medical Examiner, and four were handled by the Georgia Bureau of Investigation Medical Examiner’s Office.

This 22% figure is not surprising because accreditation is both rare and recent, while most of the convictions in our data set are not recent (see Figure 8). NAME accreditation began in 1975, but only a small number of facilities were accredited.⁹⁷ In 1999, the NAME accreditation process was “completely revised.”⁹⁸ By around 2002-2004, around 40-42 death investigation facilities were

⁹¹ Brandon L. Garrett, *Autopsy of a Crime Lab: Exposing the Flaws in Forensics*, 105 (2021).

⁹² <https://name.memberclicks.net/inspection-accreditation>

⁹³ National Commission on Forensic Science, *Accreditation of Medicolegal Death Investigation Offices*, 9; Victor W. Weedn, *Ask Experts about Forensic Certification and Accreditation*, 25 *Crim. Just.* 48, 49 (2010).

⁹⁴ Ross E. Zumwalt, *Quality Assurance in Medical Examiner Practice Address at Medicolegal Death Investigation System: Workshop Summary 2003*, 21.

⁹⁵ Mitchell Weinberg et al., *Characteristics of Medical Examiner/Coroner Offices Accredited by the National Association of Medical Examiners*, 58 *J. Forensic Sci.* 1193, 1197 (2013).

⁹⁶ The Arkansas State Medical Examiner, Pima County (Arizona) Medical Examiner’s Office, San Diego County Medical Examiner’s Office, Georgia Bureau of Investigation Medical Examiner’s Office, Cook County Medical Examiner, Maryland Office of the Chief Medical Examiner, New Mexico Office of the Medical Investigator, Franklin County (Ohio) Forensic Science Center, Hamilton County (Ohio) Coroner Office, Philadelphia Medical Examiner Office, Knox County (Tennessee) Medical Examiner’s Office, Nueces County (Texas) Medical Examiner’s Office, Utah Office of the Medical Examiner, and Virginia Office of the Chief Medical Examiner.

⁹⁷ Garry Peterson, *National Association of Medical Examiners Accreditation of Medical Examiner Offices Address at Medicolegal Death Investigation System: Workshop Summary 2003*, 19.

⁹⁸ Weinberg et al., *Characteristics of Medical Examiner/Coroner Offices*, 1193.

accredited by NAME out of around 2,000 death investigation facilities in the US. However, since accredited facilities tended to be larger ones, this small number of accredited facilities served around 23-25% of the US population.⁹⁹ By 2013, only around 60 facilities were accredited.¹⁰⁰ In 2015, the NCFSS estimated that fewer than 100 of more than 2,400 death investigation offices were accredited.¹⁰¹ In 2018, the Bureau of Justice Statistics reported, there were around 2,000 death investigation facilities in the US, and only 17% of them were accredited by either NAME or IACME.¹⁰² This would mean there are around 340 accredited facilities in the US, an estimate that seems high. At the time of publication of this report, 111 facilities were listed as NAME accredited, out of 242 facilities listed on NAME's website, and only 40 facilities were IACME accredited.¹⁰³

There were no cases in which a IACME accredited facility contributed to the wrongful conviction. However, IACME accreditation, which began only in 2005, is even rarer and more recent than NAME accreditation.¹⁰⁴

G. OCCUPATIONAL IDENTITY

In this section, we report on the occupational titles and qualifications of individual experts who gave evidence in exoneration cases. Although we use the terms “medical examiner” and “coroner” to describe some of these experts, the numbers do not correspond with the numbers of cases that occurred under “medical examiner” and “coroner” systems described in the preceding section. In particular, more cases occurred under “coroner systems” than occurred under “coroners.” This is a consequence of the US patchwork system: merely knowing the type of the system does not enable us to know the qualifications of the personnel it employs. Although “coroners” do not necessarily need to be board-certified forensic pathologists—and in some systems do not even need to be physicians—some coroner systems employ or contract pathologists, or even board-certified forensic pathologists, to carry out death investigations.

As discussed in sections II.B and III, death investigation in the US is practiced by a variety of personnel with different qualifications and job titles. The source documents we relied upon, which were primarily legal documents, referred to these experts using a variety of terms. The most common terms were “forensic pathologist,” “pathologist,” “medical examiner,” “coroner,” and “physician.” It was unclear how literally we should take the use of such terms by legal actors. If a court described an expert as a “forensic pathologist,” did that mean that expert was board certified in forensic pathology? If they referred to them merely as a “pathologist,” did that mean they were not board certified or that they were certified in another area of pathology, such as clinical or anatomic pathology? If a court used the term “medical examiner,” was the expert board certified

⁹⁹ Randy Hanzlick, Overview of the Medicolegal Death Investigation System in the United States Address at Medicolegal Death Investigation System: Workshop Summary 2003), 9; Graham R. Jones, *The Changing Practice of Forensic Science*, 47 J. Forensic Sci. 437, 438 (2002); Matthew J. Hickman et al., *Medical Examiners and Coroners' Offices, 2004*, Bureau of Justice Statistics, 2 (June, 2007), <https://bjs.ojp.gov/redirect-legacy/content/pub/pdf/meco04.pdf>.

¹⁰⁰ Weinberg et al., *Characteristics of Medical Examiner/Coroner Offices*, 1193.

¹⁰¹ National Commission on Forensic Science, *Accreditation of Medicolegal Death Investigation Offices*, 2.

¹⁰² Brooks, *Medical Examiner and Coroner Offices, 2018*, 1, 3.

¹⁰³ https://www.thename.org/index.php?option=com_nicdirectorysearch&view=search&id=12295#/ (accessed May 31, 2024); <https://theiacme.com/page/CurrentlyAccredited> (accessed May 31, 2024).

¹⁰⁴ <https://theiacme.com/page/CurrentlyAccredited> (accessed May 31, 2024).

or not? Were they *the* medical examiner, did they work at the medical examiner’s office, or were they contracted to work the case by the medical examiner’s office? If a court described an expert as a “coroner,” was the expert board certified in forensic pathology? Were they even a physician?

Even if the expert was described as a “board-certified forensic pathologist,” were they certified by the ABP? As noted above, reputable disciplinary organizations recognize a second certifying body, the American Osteopathic Board of Pathology (AOBP). However, its significance is unclear since discussions in the death investigation literature that extol the importance of board certification tend to mention ABP, not AOBP, certification.

In addition, at least three alternate “rump” certification bodies have existed during the period under study, which are not considered reputable by the discipline: the American Board of Forensic Examiners, which began granting “board certification” in forensic pathology in exchange merely for providing educational credentials and a fee in 1992;¹⁰⁵ the American Board of Forensic Pathology, which “sounds suspiciously similar to the American Board of Pathology,” and ceased operation in 1996; and the American College of Forensic Examiners Institute, also founded in 1992.¹⁰⁶ These “diploma mills” added confusion to the title ‘board certified,’ which confounded judges and juries across the country.”¹⁰⁷ For example, Mississippi forensic pathologist Steven Hayne “routinely” testified that he was “board certified in forensic pathology,” but his certification was from American Board of Forensic Pathology, not the American Board of Pathology.¹⁰⁸

In this section we analyze the qualifications of the experts who gave evidence in our 151 cases. In 12 of the 151 cases, the expert was either a physician with no claim to pathological expertise or not a physician at all (see sections V.G.6-V.G.7). In the remaining 139 of the 151 cases (92%), the expert had some form of pathological expertise.

In order to better understand the qualifications of the experts in these 139 cases, we first tried to determine the expert’s name. This was not always possible. In some cases, we had a paucity of source documents. In others, the source documents anonymized the expert, referring to them only by title (e.g., “the medical examiner” or “the coroner”). However, in 126 of the 139 cases (91%), we were able to determine the name of at least one government expert who claimed pathological expertise.

We then checked whether the named individuals in these 126 cases were board certified in any pathological specialty, including forensic pathology, by the ABP, using a variety of sources, most importantly [Certification Matters](#), an online resource of the American Board of Medical Specialties (ABMS).¹⁰⁹ We were not able to check for certification by the AOBP because, in

¹⁰⁵ Jentzen, *Death Investigation in America*, 92-93.

¹⁰⁶ Balko & Carrington, *The Cadaver King and the Country Dentist*, 211-212.

¹⁰⁷ Jentzen, *Death Investigation in America*, 92-93.

¹⁰⁸ Balko & Carrington, *The Cadaver King and the Country Dentist*, 211.

¹⁰⁹ Information was obtained from the following sources: (1) [Certification Matters](https://perma.cc/GL7G-TKAO) (<https://perma.cc/GL7G-TKAO>), an online resource of the American Board of Medical Specialties (ABMS). This resource [lists individuals certified by the ABP](#), and the ABP [specifically refers the public to it](#) (<https://perma.cc/PG4B-ZXGM>) to verify certifications. However, Certification Matters acknowledges that some board-certified physicians may not be listed if they “asked their ABMS Member Board to keep their information private.” <https://www.certificationmatters.org/faqs/> (<https://perma.cc/RFF3-4S6Z>). It also does not list deceased experts. (2) A report, “Forensic Pathologists in the United States who Died Since

contrast to ABP certification, there does not appear to be a resource that allows the public to determine whether an individual possesses AOBP certification. Based on this information, we coded the government expert with the greatest claimed pathological expertise in each of the 151 cases (Table 4).

1970,” published by the National Association of Medical Examiners (NAME). This list includes both “Board Certified Forensic Pathologists and Pathologists who practiced Forensic Pathology but were not Board Certified.” Randy Hanzlick & Denise McNally, *Forensic Pathologists in the United States who Died Since 1970*, National Association of Medical Examiners, (Sept. 22, 2022), <https://name.memberclicks.net/assets/docs/FPMortality1970toPresent.pdf> <https://perma.cc/URW9-RNWH>. We used it to check whether individuals may have been board certified but are not listed on Certification Matters because they are deceased. (3) A roster of all forensic pathologists who became board certified from the introduction of board certification in 1959 through 1986. William G. Eckert, *The Forensic Pathology Specialty Certifications*, 9 Am.J Forensic Med Pathol 85, 86 (1988). We used this source to determine whether pathologists not listed on Certification Matters (most commonly because they were deceased) were in fact board certified. (4) Morgan’s study provided us with the names of experts in two cases ([Richard Dziubak](#) and [Letha Hockersmith](#)) in which we were not able to identify the experts from other sources. John Morgan, *Wrongful Convictions and Claims of False or Misleading Forensic Evidence*, 68 J. Forensic Sci. 908 (2023) <https://doi.org/10.1111/1556-4029.15233>.

Table 4. Occupational identity of most qualified expert in 151 death investigation exoneration cases. Occupational identities are roughly ordered from most qualified to least.

Occupational Identity	Definition	Number
Board certified in forensic pathology	The expert was known to be board certified in forensic pathology by the ABP at the time of conviction.	92
Board certified other pathology specialty	The expert was known NOT to be board certified in forensic pathology, but was known to be certified in another pathological specialty at the time of conviction.	15
Medical examiner	The expert was described as a “medical examiner” and was either known NOT to be board certified in any pathological specialty or was not named.	22
Pathologist who practiced forensic pathology but who was not board certified	The expert was listed on NAME’s list of “Forensic Pathologists in the United States who Died Since 1970,” but was NOT known to be board certified.	1
Forensic pathologist	The expert was described as a “forensic pathologist” and was either known NOT to be board certified in any pathological specialty or was not named.	2
Pathologist	The expert was described as a “pathologist” and was either known NOT to be board certified in any pathological specialty or was not named.	8
Neurosurgeon	Self-explanatory.	4
Pediatrician	Self-explanatory.	4
Pediatric radiologist	Self-explanatory.	1
Toxicologist	Self-explanatory.	1
Coroner without MD	The expert was described as a “coroner” and was known NOT be a physician.	1
Total		151

1. BOARD-CERTIFIED FORENSIC PATHOLOGISTS

As shown in Figure 17, in 92 of the 151 cases (61%), the expert was known to be board certified in forensic pathology. The true number may be greater because, as noted above, there were 13 cases in which we were not able to determine the name of the expert.

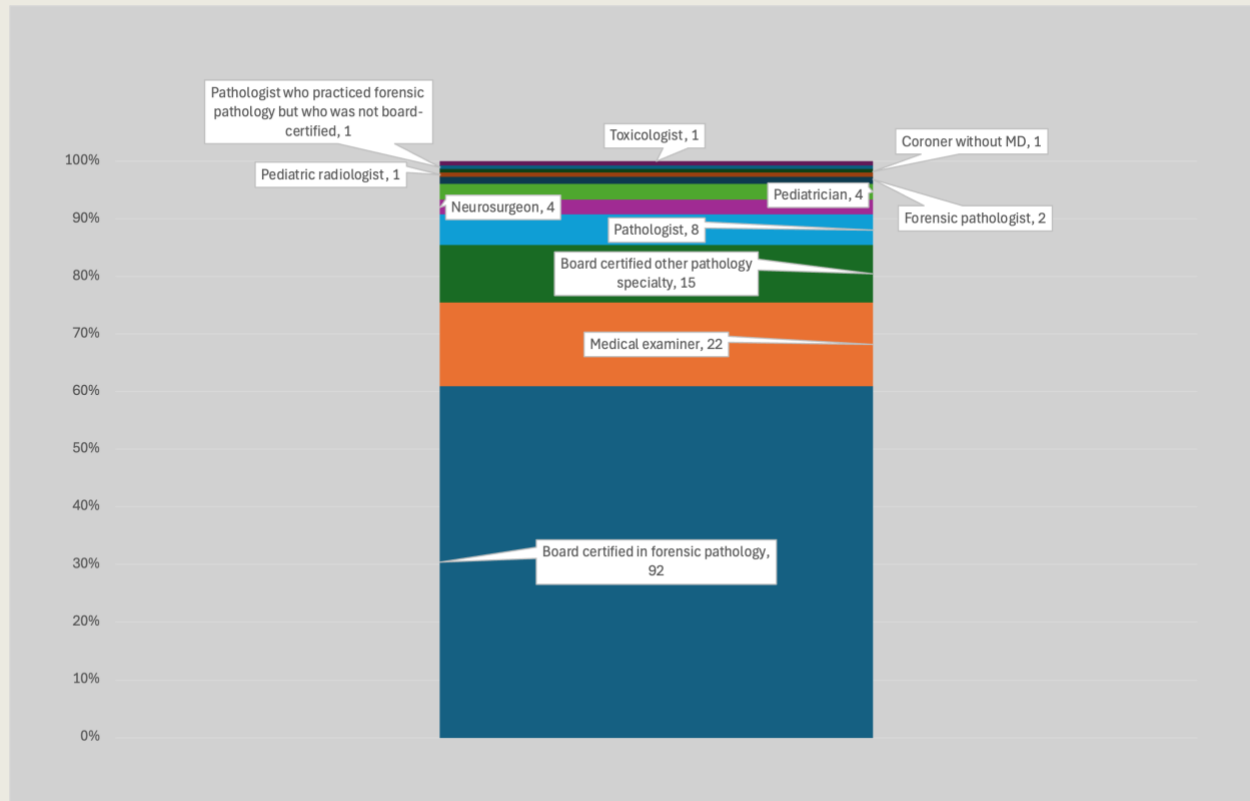


Figure 17. Occupational identity of most qualified experts in the 151 death investigation exoneration cases. Board-certified forensic pathologists were experts in 61% of the cases.

Seventy-two different individual board-certified forensic pathologists were the experts in these 92 cases. This is more than a tenth of the around 500 board-certified forensic pathologists estimated to be practicing in the US in 2015.¹¹⁰ Two of the 72 (Charles Harlan and Dawn LaJoie) are listed in Certification Matters as “no longer board certified.” The rest who are alive remain board certified today.¹¹¹

In at least two cases, those of [Lacresha Murray](#) and [Walter Ograd](#), at least two board-certified forensic pathologists contributed to the conviction. In at least one case, [Cynthia Sommer](#), at least three board-certified forensic pathologists contributed.

¹¹⁰ NCFS, *Increasing the Number*, 3. The BJS reported that around 890 “autopsy pathologists” were employed by death investigation offices in 2018. Although BJS says autopsy pathologists are “also referred to as forensic pathologists,” its definition does not appear to require that they be board certified in forensic pathology. Instead, it says they “are physicians who are specially trained in the examination of bodies of those who have died suddenly, unexpectedly, or violently.” Brooks, *Medical Examiner and Coroner Offices*, 2018, 2.

¹¹¹ Cyril Wecht was board certified in 1964. Eckert, *The Forensic Pathology Specialty Certifications*, 87. Wecht recently died. Clay Risen, *Cyril H. Wecht, 93, Dies; Coroner Cast Doubt on Kennedy Assassination*, New York Times, May 17, 2024, <https://www.nytimes.com/2024/05/17/us/cyril-h-wecht-dead.html>. However, he was alive at the time of analysis, but he was not listed in Certification Matters. However, the Duquesne University website stated that “Dr. Wecht is certified by the American Board of Pathology in anatomic, clinical and forensic pathology, and is a fellow of the College of American Pathologists, the American Society of Clinical Pathologists and the National Association of Medical Examiners,” (<https://www.duq.edu/faculty-and-staff/cyril-h-wecht-md-jd.php> [<https://perma.cc/TFJ7-QXN3>]). As noted *supra* note 109, Certification Matters does not list some board-certified physicians for privacy reasons. In this study, we coded Wecht as a board-certified forensic pathologist.

There is, therefore, no basis to conclude that contribution of death investigation to false convictions can be entirely, or even primarily, attributed to the shortage of board-certified forensic pathologists in the US.¹¹² To be fair, however, exoneration cases select for more serious and notorious crimes, and board-certified forensic pathologists may be more likely to find themselves involved in such cases, especially because offices that lack forensic pathological expertise often refer complex cases to neighboring offices with greater expertise.

2. BOARD-CERTIFIED ANATOMICAL & CLINICAL PATHOLOGISTS

In an additional 15 of the 151 cases, the expert was board certified in another pathological specialty (this was always anatomical or clinical pathology, or a combination of the two).

In three of these 15 cases, the expert would become board certified in forensic pathology after the conviction.

In one case ([John Peel](#)), the expert (Joan Wood) is no longer board certified.

Forensic pathology is a “subspecialty of pathology.”¹¹³ There are two specialties of pathology— anatomic and clinical—and six other subspecialties of pathology in which board certification is available (chemical, hematology, medical microbiology, molecular genetic, neuropathology, and pediatric). Forensic pathologists sometimes distinguish their subspeciality by referring to these other specialties collectively as “hospital pathology.”¹¹⁴ “Hospital pathologists,” forensic pathologists have claimed, “simply did not possess the additional skills required for criminal death investigation.”¹¹⁵ Forensic pathologists similarly distinguish “forensic autopsies” from “hospital autopsies”: “There are inherent differences between the questions, approach, and expectations addressed by the nonmedicolegal (‘hospital’) autopsy and a forensic autopsy.”¹¹⁶ Therefore, it can be argued that these experts were less well qualified, or unqualified, to practice death investigation.

3. MEDICAL EXAMINERS

As noted above, most experts consider medical examiner systems to be superior to coroner systems. In 22 cases, the expert either was not certified, or their name is not known and was described as a “medical examiner.”

4. FORENSIC PATHOLOGISTS AND PATHOLOGISTS

In an additional eight cases, the expert either was not certified, or their name is not known and was described simply as a “pathologist.” In an additional two cases, the expert was described as a “forensic pathologist.” In one case ([Dean McKee](#)), the expert, Peter Lardazabal, was not board certified in any discipline, but was listed on NAME’s list of “Forensic Pathologists in the United

¹¹² See, e.g., Morgan, *Wrongful Convictions and Claims of False or Misleading Forensic Evidence*, 943.

¹¹³ B. B. Randall et al., *Practice Guideline for Forensic Pathology*, 122 Arch. Pathol. Lab. Med. 1056, 1057 (1998).

¹¹⁴ NCFs, *Increasing the Number*, 4.

¹¹⁵ Jentzen, *Death Investigation in America*, 166.

¹¹⁶ Randall et al., *Practice Guideline for Forensic Pathology*, 1059.

States who Died Since 1970.” We, therefore, characterize him on Table 4 as NAME did: as a “pathologist who practiced forensic pathology but who was not board certified.”

The qualifications of these individuals to perform death investigations and autopsies has long been contested. During the period in which these convictions occurred, board-certified forensic pathologists complained that “general pathologists continued to perform medicolegal autopsies and promote themselves as forensic pathologists.”¹¹⁷

5. CORONERS

In 12 of the 151 cases, the expert was described as a “coroner.” As noted above, “coroners” may not necessarily be forensic pathologists, board certified or not. They may not necessarily be pathologists or even physicians, raising the question of whether experts described as “coroners” were poorly qualified. However, that was not generally the case. In eleven of the twelve cases, the “coroner” was board certified in forensic pathology (these cases are included in the 92 cases discussed in section V.G.1). In the one remaining case, the conviction of [Darrell Clark](#) for murder in Georgia in 1998, the coroner was a funeral director without a medical degree. At Clark’s trial:

Floyd County Coroner, Craig Burnes, who was a funeral director and embalmer, but not a physician, testified that he did not see any evidence of powder burns or stippling. Asked by prosecutor Steven Cox what that meant, Burnes testified, “It tells me that it is...somewhat of a distance shot.” Burnes estimated the gun was at least 12 to 18 inches from Bowling’s head when the shot was fired.

Burnes said no autopsy was performed because the family approved donation of the boy’s organs. Asked about blackened skin around the bullet hole, Burnes said it was the result of bruising and also from black powder that he put into the wound as part of the pre-embalming process. He said the powder absorbed blood and acted to prevent further fluid loss from the wound.

Burnes’s testimony was rebutted at trial by a physician:

The defense also called Dr. Harvey Howell, the Bartow County, Georgia, medical examiner, who said he had examined the photographs of Bowling’s body at the funeral home as well as the CAT scan done at the hospital and the medical records of Bowling’s treatment.

Dr. Howell said the angle of the bullet was closer to 30 degrees, instead of the 45 degrees cited by the treating physician. He said that angle was “very characteristic of a self-inflicted wound. Dr. Howell said he saw a few little red speckles around the edges of this wound. That’s powder stippling...When you fire a gun, most of that powder burns up, but there’s a little bit of the powder that doesn’t burn, and those—those little tiny fragments of powder come out as little tiny fragments, and then they hit the skin.”

¹¹⁷ Jentzen, *Death Investigation in America*, 92.

Dr. Howell said the gun was in contact with Bowling's skin when fired. He said the entrance wound was larger than the exit wound because the gun had been fired so close to the head that gasses that followed the bullet blew out the skin. "And the other thing...that lets me know this is a contact wound is the black coloration...a combination of charred flesh and powder...This is clearly a contact wound."

Clark was exonerated in 2022.

6. PHYSICIANS

In nine of the 151 cases, the expert was a physician without any claimed specialized expertise in pathology who diagnosed SBS, a diagnosis that was rebutted by pathological evidence. Although seven of the nine cases were not death investigations because the victim did not die and the defendant was charged with child abuse, pathologists clearly felt that the SBS diagnosis placed the evidence sufficiently within their domain of expertise that they felt authorized to rebut it. And, indeed, pathology is generally considered one of the principal disciplines relevant to SBS, though certainly not the only one.¹¹⁸

In four of the nine cases, the non-pathologist physician was a neurosurgeon, four were pediatricians, and one was a pediatric radiologist. We did not investigate whether these experts were board certified in these specialties.

In six of the seven child abuse cases, a pathologist provided rebuttal evidence. In the remaining case ([Abigail Tiscareno](#)) a previously undisclosed pathology report, which contradicted the non-pathologist physician's opinion, was discovered.

Thus, the phenomenon of non-pathologist physicians invading the domain of death investigation (or forensic pathology) and driving the investigation appears to have occurred exclusively in cases in which the SBS diagnosis was deployed. The pattern was even more prevalent in child abuse cases. Because there was no death, pediatricians and neurosurgeons were freer to give evidence about the cause of injuries without scrutiny or confirmation by death investigators.

For example, in the conviction of [Terry Ceasor](#) for the child abuse of his girlfriend's 16-month-old son, Brenden, in Michigan in 2005, Holly Gilmer-Hill, a neurosurgeon,

testified that it took a good deal of force to cause retinal bleeding. She told the jury that the combination of subdural blood with retinal hemorrhage was diagnostic for child abuse. Dr. Gilmer-Hill said that retinal hemorrhage was caused by "being shaken or slammed onto a surface, either hard or soft. Usually repeatedly." Based on her training and experience and her treatment of Brenden, Gilmer-Hill did not believe his injuries were the result of an accident. Dr. Gilmer-Hill further testified that a fall from a couch onto a carpeted floor could not have caused injuries as severe as Brenden's.

¹¹⁸ Philip L. Wheeler, *Shaken baby syndrome—an introduction to the literature*, 12 Child Abuse Review 401, 404 (2003) <https://onlinelibrary.wiley.com/doi/abs/10.1002/car.826>.

Although Ceasor's attorney, Kenneth Lord, cross-examined Gilmer-Hill about research by forensic pathologists casting doubt on her assertions, he

did not present any expert testimony at Ceasor's trial because Ceasor's family could not come up with any more money to pay for the expert. Lord also never asked the court to approve court funding for the expert.

In the absence of a defense expert, given Gilmer-Hill's impressive credentials, the jury probably accepted her explanation for the injuries. The jury convicted Ceasor, and he was sentenced to two to 15 years in prison.

Post-conviction, Ceasor filed affidavits from four experts—two board-certified forensic pathologists, a clinical neurosurgeon, and a biomedical engineer—that

said that Brenden's injuries were consistent with a short fall from the couch onto the coffee table or the floor and inconsistent with abusive shaking.

Non-pathologist physicians seemed especially able to drive the investigation in non-homicide child abuse cases. In the two murder cases, in contrast, death investigators at least questioned the non-pathologist physicians' explanations of the cause of death at the time of conviction. At the trial of [Warren Hales](#) in Utah in 2004, board-certified forensic pathologist John Plunkett rebutted a pediatric neurosurgeon's diagnosis of SBS, but Hales was convicted anyway.

[Krystal Voss](#) was convicted of the murder of her 17-month-old son, Kyran, in 2004 in Colorado based in part on the testimony of Kathryn Wells, a pediatrician, that the cause of death was SBS. At a hearing after the conviction, board-certified forensic pathologist Robert Bux

said he disagreed with Wells's conclusion that Kyran was a victim of SBS. He said he believed it was impossible to shake a 26-pound toddler hard enough to generate the force necessary to cause the brain damage that the boy had.

He also testified that a month prior to Voss's trial, the prosecution sent him a copy of Dr. Wells's testimony at the preliminary hearing in the case. He said that he read the testimony and informed the prosecution that he did not agree with Wells. Bux could not remember with whom he discussed his disagreement. The prosecution did not call him to testify—the first and only time he was not called to testify among hundreds of first-degree murder cases in which he performed the autopsy.

7. NON-PHYSICIANS

In two of the 151 cases, the expert was not a physician at all, but gave evidence that fell within the domain of death investigation. One was the [Darrell Clark](#) case, described in section V.G.5 above, which involved a coroner who was a funeral director without a medical degree. The other was the conviction of [Michael Pardue](#) for murder of Ronald Rider in Baldwin County, Alabama in which

Nelson E. Grubb, a state toxicologist, testified that he had performed an autopsy on Rider. Although he first listed the cause of death as a blow from a crowbar, he testified the cause of death was a gunshot wound in the brain. Grubb had revised his opinion on the cause of death after Pardue confessed that he was holding a sawed-off double-barreled .410-gauge shotgun, when Rider turned and raised a crowbar.

Pardue's defense attorney "did not cross-examine Grubb about the fact that Grubb did not have a medical license."¹¹⁹

As noted above, most coroners are elected, and in some jurisdictions there is no requirement that they be pathologists or even physicians. As a result, one pathologist complained, "physicians with years of specialized training perform the same task as a high school graduate."¹²⁰

In the 1990s, some counties began electing nurses as coroners, as the new specialty of forensic nursing began spread across the US. But the role of nonphysicians was not confined to coroner's offices. Large medical examiner's offices began allowing "pathologist assistants" to perform autopsies "sometimes with minimal supervision."¹²¹

H. OCCUPATIONAL IDENTITY AND DEATH INVESTIGATION SYSTEM

Because, as noted in the preceding section, the type of death investigation system does not necessarily determine the qualifications of the expert employed to carry out the death investigation, Figure 18 combines the information from the preceding two sections to show the occupational identity of the expert used in each exoneration case by the type of death investigation used in the county. It shows that board-certified forensic pathologists contributed to a greater share of false convictions in the counties with coroner systems than they contributed to false convictions in counties run by medical examiners or "other officials." Thus, false convictions under coroner systems do not appear to be caused by the deployment of unqualified experts.

¹¹⁹ Grubb was described as "Dr." in some legal documents so may have had a Ph.D.

¹²⁰ Steven C. Clark, quoted in Jentzen, *Death Investigation in America*, 95.

¹²¹ *Id.*, 171.

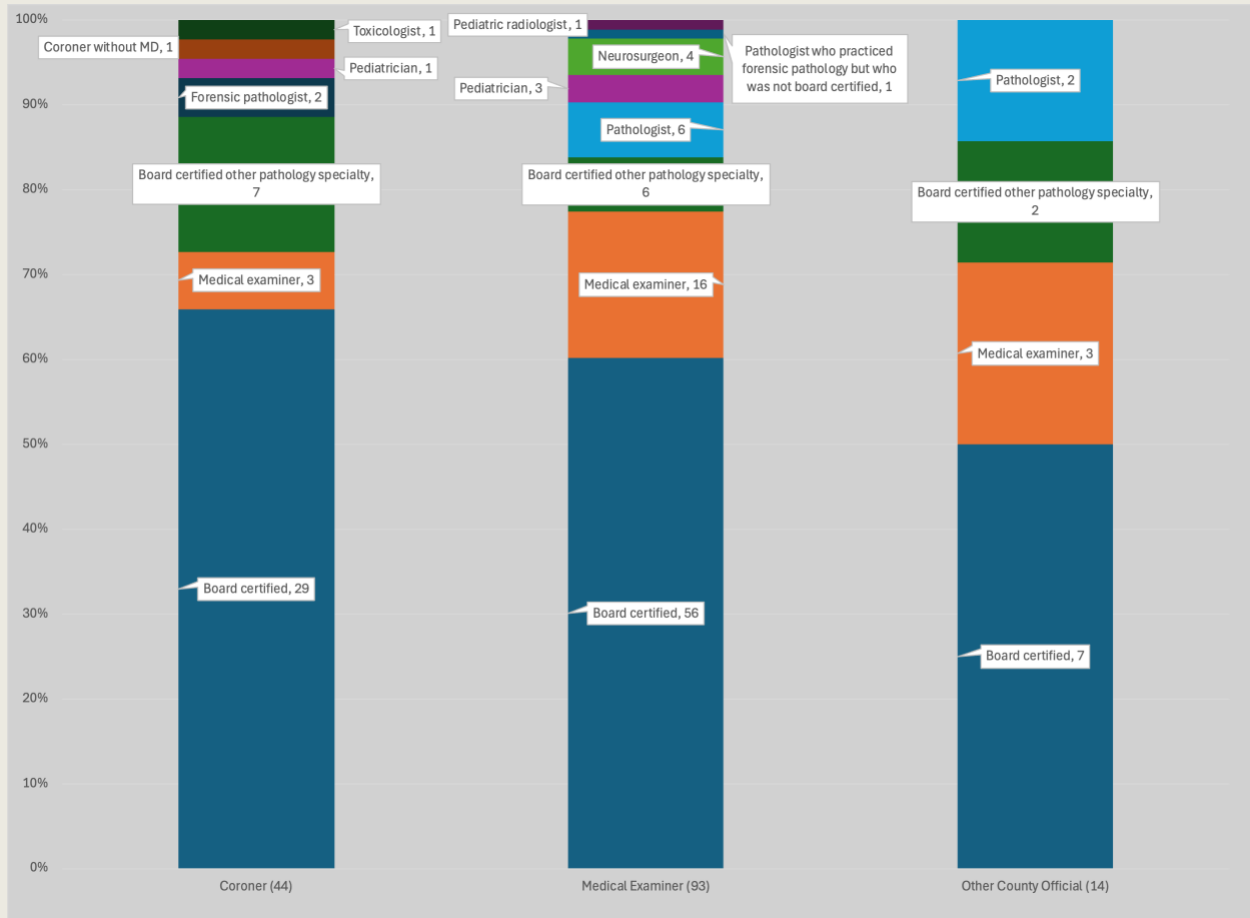


Figure 18. Occupational identity of expert by county's death investigation system in 151 exoneration cases. Column totals are shown in parentheses.

I. REPEAT PLAYERS

Several experts were involved in more than one exoneration case. Of the 106 experts for whom we were able to find names, 23 were “repeat players” who contributed to more than one case. Some of these were single cases with multiple defendants. An example is pathologist Patricia Newhouse who contributed to the conviction of four defendants in a single case, centered around [Laurie Moore](#), in Michigan in the late 1980s. The most significant repeat player was widely criticized Mississippi pathologist Stephen Hayne who contributed to five convictions.¹²²

Of the 72 board-certified forensic pathologists who were involved in exoneration cases, 18 were repeat players. Charles Harlan and Erik Mitchell were involved in three cases each. Harlan contributed to two cases, one with two defendants, but Mitchell contributed to three separate cases. Harlan later lost his medical license, and thus his board certification, but Mitchell remains certified.¹²³ The remaining 16 repeat players were involved in two convictions each.

¹²² Balko & Carrington, *The Cadaver King and the Country Dentist*.

¹²³ Associated Press, *Tennessee: Former Medical Examiners Loses License*, New York Times, Apr. 22, 2005, at A16 <https://www.nytimes.com/2005/04/22/health/national-briefing-south-tennessee-former-medical-examiner-loses.html>.

J. TROUBLE SPOTS

Even before beginning this study, we knew there were certain areas of concern about the contribution of death investigation to false conviction. One was the controversial diagnosis of “Shaken Baby Syndrome” (SBS), which we already knew was frequently seen in exoneration cases.¹²⁴ A second was the role of pathology in the investigation of fatal fires.¹²⁵ A third was the potential for contextual bias to influence the death investigation.¹²⁶

1. SHAKEN BABY SYNDROME

The diagnosis of SBS is controversial, although there is now a meta-controversy about whether or not SBS is indeed controversial.¹²⁷ Experts from a variety of disciplines support accusations of SBS, including pediatricians, emergency medicine specialists, trauma specialists, ophthalmologists, neurologists, nurses, social workers, and physicians from a variety of specialties, as well as physicians with special training in areas purportedly designed to detect child abuse such as membership on a “child protection team.”¹²⁸ SBS cases often feature multiple experts attesting to the SBS diagnosis from different disciplinary perspectives. Death investigators too, often gave evidence in SBS cases, complementing the evidence of other experts. As noted above, we also include cases in which a death investigator testified for the defense at trial or served as a post-conviction expert. We reason that in such cases the evidence was in the domain of death investigation because it was rebutted by a death investigator.

¹²⁴ E.g., Shaken baby syndrome: investigating the abusive head trauma controversy (Keith Findley et al. eds., 2023); Deborah Tuerkheimer, *Flawed Convictions: “Shaken Baby Syndrome” and the Inertia of Injustice* (2014); Deborah Tuerkheimer, *The Next Innocence Project: Shaken Baby Syndrome and the Criminal Courts*, 87 Wash. U. L. Rev. 1 (2009); Joëlle Anne Moreno & Brian Holmgren, *Dissent into Confusion: The Supreme Court, Denialism, and the False “Scientific” Controversy over Shaken Baby Syndrome*, 2013 Utah Law Review 153 (2013); Joseph D. Hatina, *Shaken Baby Syndrome: Who Are the True Experts?*, 46 Clev. St. L. Rev. 557 (1998); Deborah W. Denno, *Concocting Criminal Intent*, 105 Georgetown Law Journal 323 (2017).

¹²⁵ Neil Richard Morling & Marika Linnéa Henneberg, *Contextual information and cognitive bias in the forensic investigation of fatal fires: do these incidents present an increased risk of flawed decision-making?*, 62 International journal of law, crime and justice 100406, 2 (2020).

¹²⁶ E.g., Dror et al., *Cognitive Bias in Forensic Pathology Decisions*; Peterson et al., *Commentary on: Dror IE, Melinek J, Arden JL, Kukucka J, Hawkins S, Carter J, et al. Cognitive bias in forensic pathology decisions. J Forensic Sci. <https://doi.org/10.1111/1556-4029.14697>. Epub 2021 Feb 20*; Dror et al., *Authors’ Response to Peterson et al Commentary on*; Tse et al., *Commentary on: Dror I, Melinek J, Arden JL, Kukucka J, Hawkins S, Carter J, et al. Cognitive bias in forensic pathology decisions. J Forensic Sci. doi: 10.1111/1556-4029.14697. Epub 2021 Feb 20*; Dror et al., *Authors’ Response to Tse et al Commentary on*; Oliver, *Commentary on: Dror IE, Melinek J, Arden JL, Kukucka J, Hawkins S, Carter J, et al. Cognitive bias in forensic pathology decisions. J Forensic Sci. <https://doi.org/10.1111/1556-4029.14697>. Epub 2021 Feb 20*; Dror et al., *Authors’ Response to Oliver Commentary on*.

¹²⁷ Shaken Baby Syndrome (Findley et al. eds.); Tuerkheimer, *Flawed Convictions*; Tuerkheimer, *The Next Innocence Project*; Moreno & Holmgren, *Dissent into Confusion*; Hatina, *Shaken Baby Syndrome*; Randy Papetti et al., *Outside the echo chamber: A response to the Consensus Statement on Abusive Head Trauma in Infants and Young Children*, 59 Santa Clara L. Rev. 299 (2019); Arabinda Kumar Choudhary et al., *Consensus statement on abusive head trauma in infants and young children*, 48 Pediatric Radiology 1048 (2018); Keith A Findley et al., *Feigned consensus: Usurping the law in shaken baby syndrome/abusive head trauma prosecutions*, Wis. L. Rev. 1211 (2019).

¹²⁸ Steven C. Gabaeff, *Exploring the controversy in child abuse pediatrics and false accusations of abuse*, 18 Legal Medicine 90, 92 (2016) <http://dx.doi.org/10.1016/j.legalmed.2015.12.004>.

At the time of analysis, the Registry counted 32 SBS cases.¹²⁹ The SBS diagnosis contributed to the conviction in all of the 32 SBS cases in the Registry except one.¹³⁰

Death investigators were involved in all 31 of these cases, albeit not always as experts for the state. As shown in Figure 19, board-certified forensic pathologists gave evidence in 16 of the 31 (52%) SBS cases. Thus, the role played by board-certified forensic pathologists in the subset of 31 SBS cases was only slightly lower than it was in the 120 non-SBS cases. In an additional three cases, an expert board certified in another pathological specialty gave evidence, and in another three cases a medical examiner gave evidence. Thus, in total, in 22 (71%) of the 31 cases, a death investigator with some form of pathological expertise (medical examiner or board-certified pathologist) gave evidence for the state that contributed to the conviction. As discussed in section V.G.6, in the remaining nine cases, a non-pathologist physician (or physicians) gave evidence for the state that contributed to the conviction, and a death investigator with some form of pathological expertise gave rebuttal evidence. By their rebuttals, death investigators signaled that the scientific questions in these nine cases fell within the domain of death investigation, even though seven of the cases were not deaths, but child abuse prosecutions. SBS prosecutions often draw on multiple experts from multiple disciplines and require especially robust, and often expensive, expert resources to defend.¹³¹

¹²⁹ By the time of publication, the number was 33. [Alan Butts](#) had been added.

¹³⁰ The exception is [Terrance Washington](#). In Washington's case, the SBS did not contribute to the conviction because it was not contested. Both parties agreed that the cause of death was SBS; they disagreed about who had done the shaking.

¹³¹ Julie Jonas, *Unequal Funding Compounds Tragedy: Failures in Defending Against Shaken Baby Syndrome Charges*, 96 Temp. L. Rev. 135, 163 (2024).

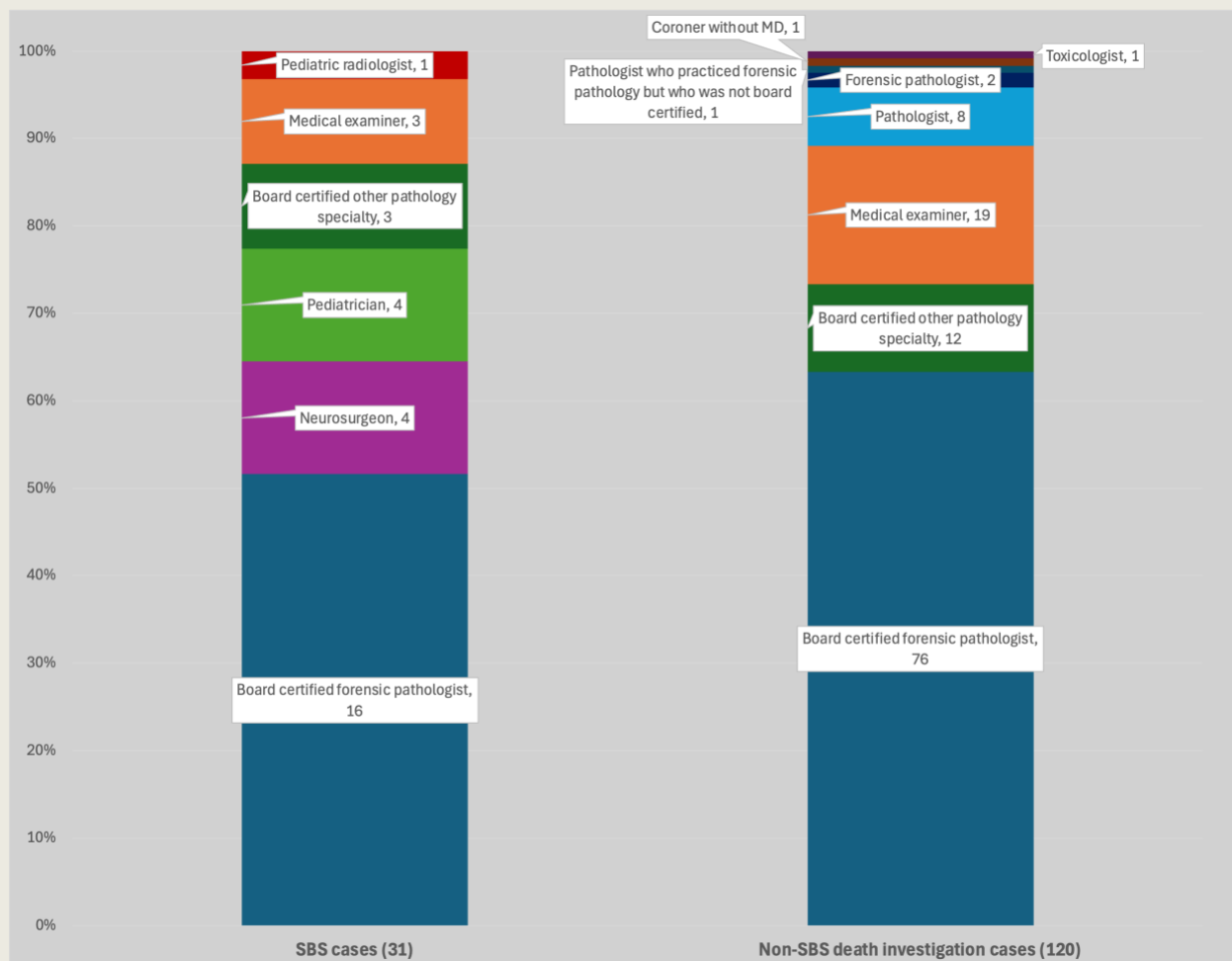


Figure 19. Occupational identities in Shaken Baby Syndrome cases compared to non-SBS death investigation cases. Column totals are shown in parentheses.

It is true that in most of the 16 SBS cases in which board-certified forensic pathologists gave evidence, the board-certified forensic pathologist did not initiate the SBS diagnosis. The diagnosis was usually initiated by someone else, such as a non-pathologist physician, a nurse, a social worker, or the police. But the board-certified forensic pathologists corroborated the opinions of the physicians and lent their authority as experts on cause of death to the evidence in support of the diagnosis.

For example, in the conviction of [Christopher Lyman](#) for murder of his nephew in Kansas in 2015, the diagnosis of SBS originated with two physicians, one pediatrician and one whose specialty was not specified, who treated Lyman's nephew at the hospital. However, at Lyman's trial, board-certified forensic pathologist

Dr. Erik Mitchell [who] performed the autopsy on Johnathan . . . said the boy died of head trauma. He testified that he found bruises on the boy's body, and that there was nothing "that would be inconsistent with multiple applications of the force of a hand." . . .

Mitchell was asked if it was possible to cause a brain injury by squeezing. He said yes. He was then asked if shaking could cause such an injury. Again, he said yes. (At a preliminary

hearing, Mitchell had testified that he did not have an opinion about whether Johnathan was shaken.)

Post-conviction, numerous experts and a review commissioned by the county attorney rebutted Mitchell's diagnosis. Lyman was exonerated in 2023.

However, there were also cases in which the board-certified forensic pathologist alone provided the evidence in support of the SBS diagnosis. For example, in the 1989 conviction of [Sean Ralston](#) for manslaughter in Massachusetts, the police suggested SBS to the emergency room physician, but the physician said he had never heard of SBS. At trial, board-certified forensic pathologist

Dr. Edward B. Sussman, chief of pathology at Worcester City Hospital, testified that he had conducted an autopsy and determined that the baby had died from blunt trauma due to severe shaking. Sussman said the baby was a victim of Shaken Baby Syndrome (SBS).

Post-conviction, four experts rebutted Sussman's determination of cause of death. Ralston was exonerated in 1992.

As noted above (section V.B.1), SBS cases disproportionately involved female defendants because they were often caregivers of children.¹³² As shown in Figure 20, Black women appear to be less affected by SBS than by death investigation cases more generally; only one Black woman, [Melonie Ware](#), was exonerated in an SBS case (compare Figure 4).¹³³ But Black men appear to be especially vulnerable in SBS cases. The number of Black men falsely convicted in SBS cases is equal to the number of white men. But the number of Black men convicted in death investigation cases generally is less than the number of white men (Figure 4). This suggests that Black male caregivers may be especially vulnerable to false conviction in SBS cases. This may be because medical and other professionals tend to perceive Black children as more likely to be victims of abuse:

the stereotype linking race to child abuse leads medical professionals to think of black parents as poor, uneducated, stressed and drug-involved, and to view battering and neglect as part of an intergenerational cycle in black families. Medical decision-making frequently occurs in situations characterized by complexity, extreme time constraints and stress. These are the very conditions that increase the likelihood that practitioners will rely on these stereotypes—knowingly or unknowingly—to disambiguate situations and increase their certainty in a diagnosis. Such reliance may be especially problematic when they are considering diagnoses for which medical experts lack consensus regarding symptomatology, like shaken baby syndrome.¹³⁴

¹³² Henry, *Smoke, But No Fire: Convicting the Innocent of Crime that Never Happened*, 25; Jackson & Gross, *Female Exonerates: Trends and Patterns*; Webster & Miller, *Gendering and Racializing Wrongful Conviction*, 990.

¹³³ This contradicts the claim that “women of color are especially vulnerable to being wrongfully convicted on SBS grounds.” Shae A. Woodburn, *Shaky Science: Shaken Baby Syndrome and Its Disproportionate Impact on False Convictions of Women of Color* *Notes*, 29 *Wm. & Mary J. Race Gender & Soc. Just.* 255, 257 (2022).

¹³⁴ Bernstein et al., *Racial Stereotyping and Misdiagnosis of Child Abuse*. See also Najdowski & Bernstein, *Race, Social Class, and Child Abuse*; Diyaolu et al., *Disparities in detection of suspected child abuse*.

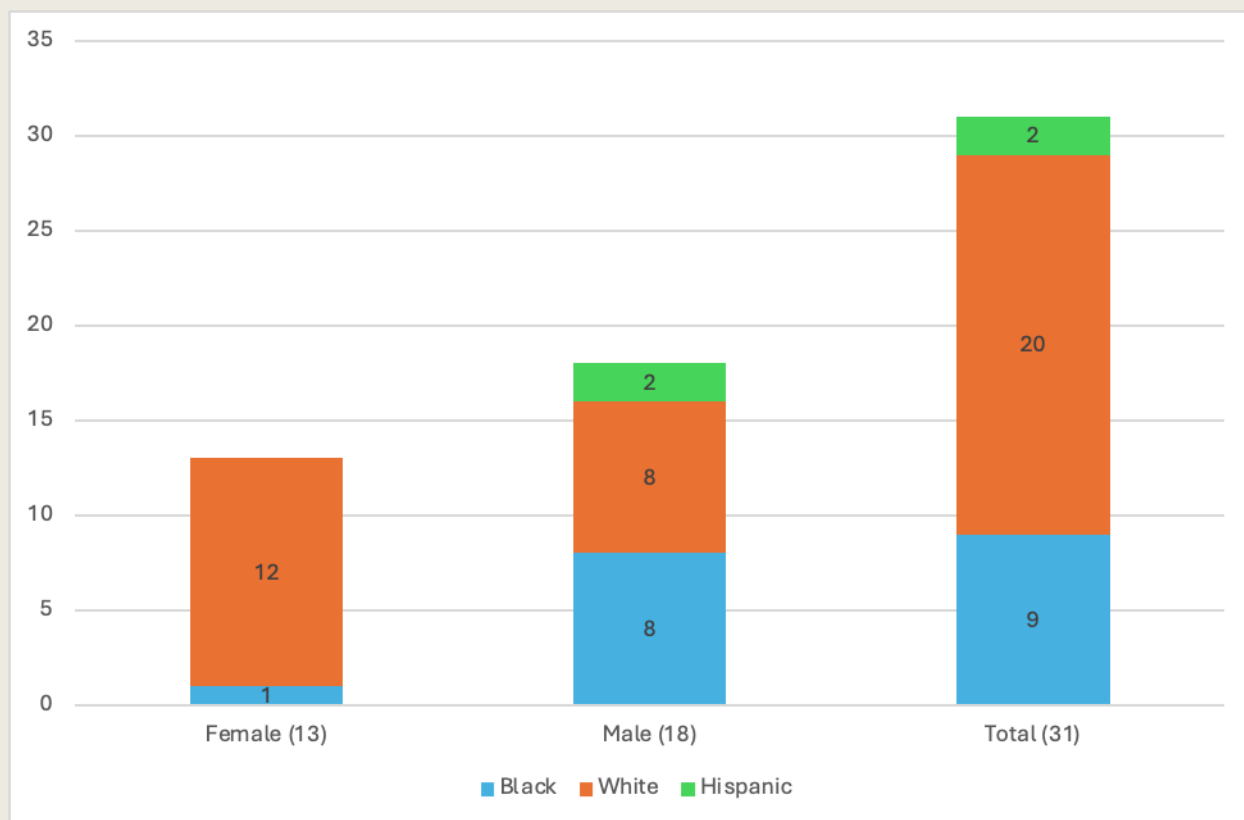


Figure 20. Race and sex of defendants in Shaken Baby Syndrome (SBS) cases. Column totals are shown in parentheses.

2. FATAL FIRES

Forensic and social scientists have expressed concern about the role of pathology in investigating fatal fires given “the fact that the fire deaths are among the most difficult pathological cases” and “effective pathology is recognized as being essential to the overall forensic strategy” in investigating fire deaths.¹³⁵ Three of the 87 arson cases in the Registry included death investigation evidence ([Sonia Cacy](#), [Louis DiNicola](#), and [Anthony Graves](#)).¹³⁶ In Cacy’s conviction for the murder of her stepfather, Bill Richardson, in Texas in 1993, for example, board-certified forensic pathologist Robert Bux testified that Richardson died of burns:

“there is no question that [Bill Richardson] died of thermal burns and that that’s the cause of death. There is a low level of carbon monoxide and soot in his mouth and nose indicate that he was alive at the time of the fire. The finding of homicide is based on the presence of the accelerant to some degree, but more importantly, on the subsequent fire investigation.”

¹³⁵ Morling & Henneberg, *Contextual information and cognitive bias in the forensic investigation of fatal fires: do these incidents present an increased risk of flawed decision-making?*, 2.

¹³⁶ As of December 13, 2023, <https://perma.cc/A5B6-Y9PN>. These 87 cases were “tagged” as arson cases, which include not only cases in which “the exoneree was convicted of arson,” but also those in which “the exoneration depended at least in part on evidence that the exoneree did not commit arson.”

Crockett County Fire Marshal Steve Kenley testified that when he received word from the medical examiner that Bill Richardson died of thermal burns, he knew this was not an ordinary fire because most people die of carbon monoxide poisoning when trapped in a fire.

Post-conviction, another medical expert reported that Richardson died of a heart attack, not burns.

3. CHANGED EVIDENCE TO FIT PROSECUTION THEORY OF THE CRIME

In their normal practice, it is common for death investigators to change their evaluations of the evidence as new information becomes available. This is consistent with their training in medicine, but it also introduces potential hazards in terms of being biased by the prosecution's theory of the crime. We found 9 cases in which a death investigator changed their evaluation in a way that made it more consistent with the prosecution's theory. For example, in the conviction of [Herman Williams](#) for the murder of his ex-wife, Penny, in Illinois in 1994, Williams's only opportunity to commit the crime came between 7:45 and 9:03 p.m. on Wednesday, September 22. At the coroner's

inquest, Deputy Chief Coroner James Whipper was asked if he knew when Penny was killed. Whipper referred to the findings of Dr. Nancy Jones, the [board-certified forensic] pathologist [for the NAME-accredited Cook County Medical Examiner] who had conducted the autopsy. "The only thing that Dr. Jones could expand on is that with the investigation that [Penny] was last seen sometime Wednesday, the condition of the body was found on that Sunday with the weather conditions, things of that nature, it is possible that [Penny] could have been dead a number of days, possibly Wednesday, Thursday. The condition of her body is consistent with her possibly being dead Wednesday or Thursday," Whipper said.

However, at trial,

Dr. Jones changed her estimate of the time of Penny's death. Dr. Jones testified that Penny had been killed on Wednesday, September 22, and no later than 1 a.m. on Thursday, September 23. That testimony narrowed the time frame considerably from the original estimate given at the coroner's inquest.

After conviction, a memo written around 2 months before trial was disclosed that said:

"According to Dr. Jones, Penny Williams could have died anytime between Wed 22, evening until late Thursday, 23rd. (Friday unlikely unless very early 1-3 am)."

In addition,

-- Dr. James Filkins, a pathologist, reviewed Dr. Jones's autopsy findings and trial testimony. He concluded that: "Dr. Jones's determination of the time of Ms. Williams's death is incorrect and unsupported by the evidence." Dr. Filkins reported that he believed

Penny’s death occurred “about 24 to 36 hours prior to her recovery from the pond, that is, sometime on Saturday, September 25, 1993.”

-- The Lake County State’s Attorney’s Office consulted with forensic pathologist Dr. Eimad Zakariya, who agreed that the testimony given by Dr. Jones at the time of trial— that the time of death was no later than Wednesday night or before 1:00 a.m. on Thursday— was unsupported.

Williams was exonerated in 2022, 28 years after his conviction.

K. PROBLEMS

What went wrong with the death investigation in these cases? We do not, and cannot, reexamine death investigators’ observations and second-guess the inferences they made. Primarily what we know about what went wrong with the death investigation is what the legal system identified as a problem through such documents as judicial opinions and litigants’ briefs. Based on our readings of these materials, three problems emerged:

- **Contradicted:** a qualified authority disagreed with the pathological conclusion at some point during the proceedings.
- **Overstated:** a death investigator overstated the probative value of the evidence.
- **Vague:** a death investigator gave vague evidence, consistent with the prosecution’s theory of the case but also with the defense theory, that the factfinder may have interpreted as supporting the prosecution’s case.

The distribution of problems is shown in Figure 21. Each problem is discussed briefly below.

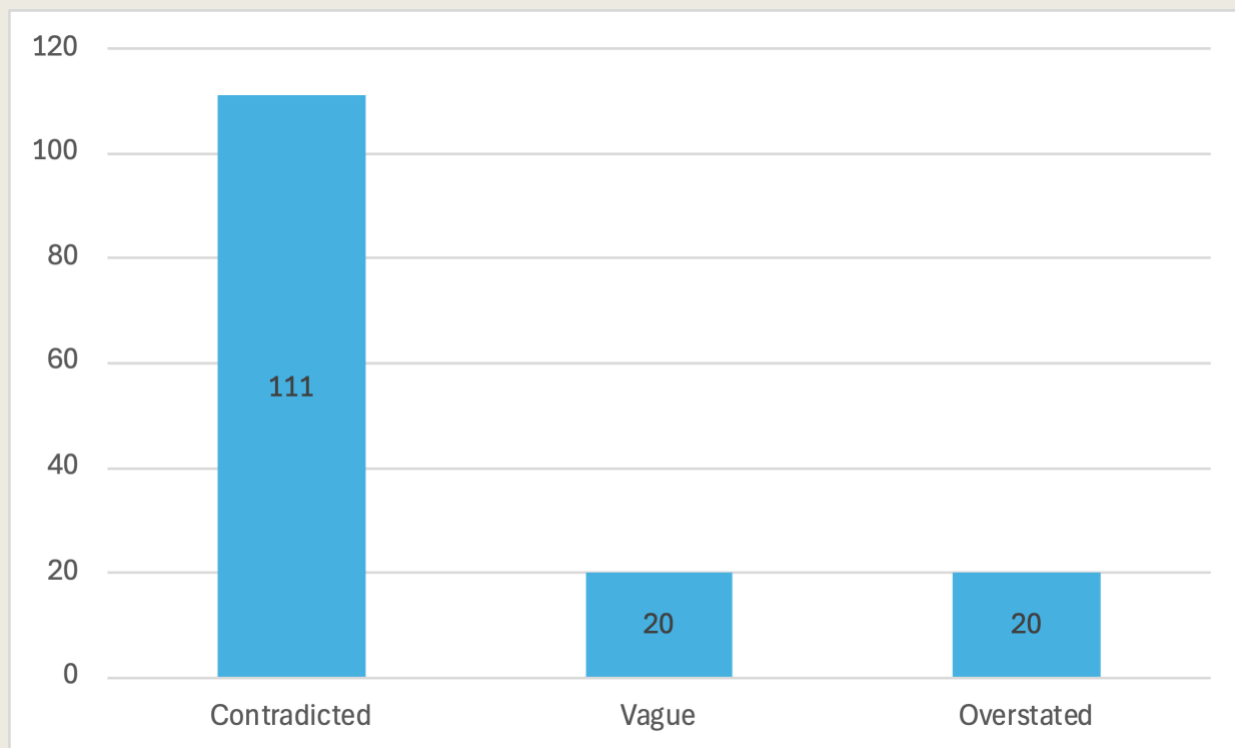


Figure 21. Problems with pathology evidence in 151 exoneration cases.

1. CONTRADICTED

The most conceptually simple—and also by far the most common—“problem” is contradiction, which means that a qualified authority disagreed with the death investigator’s original conclusion at some point during the proceedings. The contradiction could occur at any time: during the original investigation and trial or post-conviction. The contradicter can be anyone with the apparent authority to make a judgment about death investigation, including the original death investigator themselves—we do not attempt to adjudicate the qualifications of disputing experts.

As shown in Figure 22, in 92 the 111 contradiction cases, another authority alone contradicted the original death investigator. This speaks to the important role of death investigators in exonerating, rather than convicting, the innocent, a role that has a long history.¹³⁷

¹³⁷ Jentzen, *Death Investigation in America*, 42, 46.

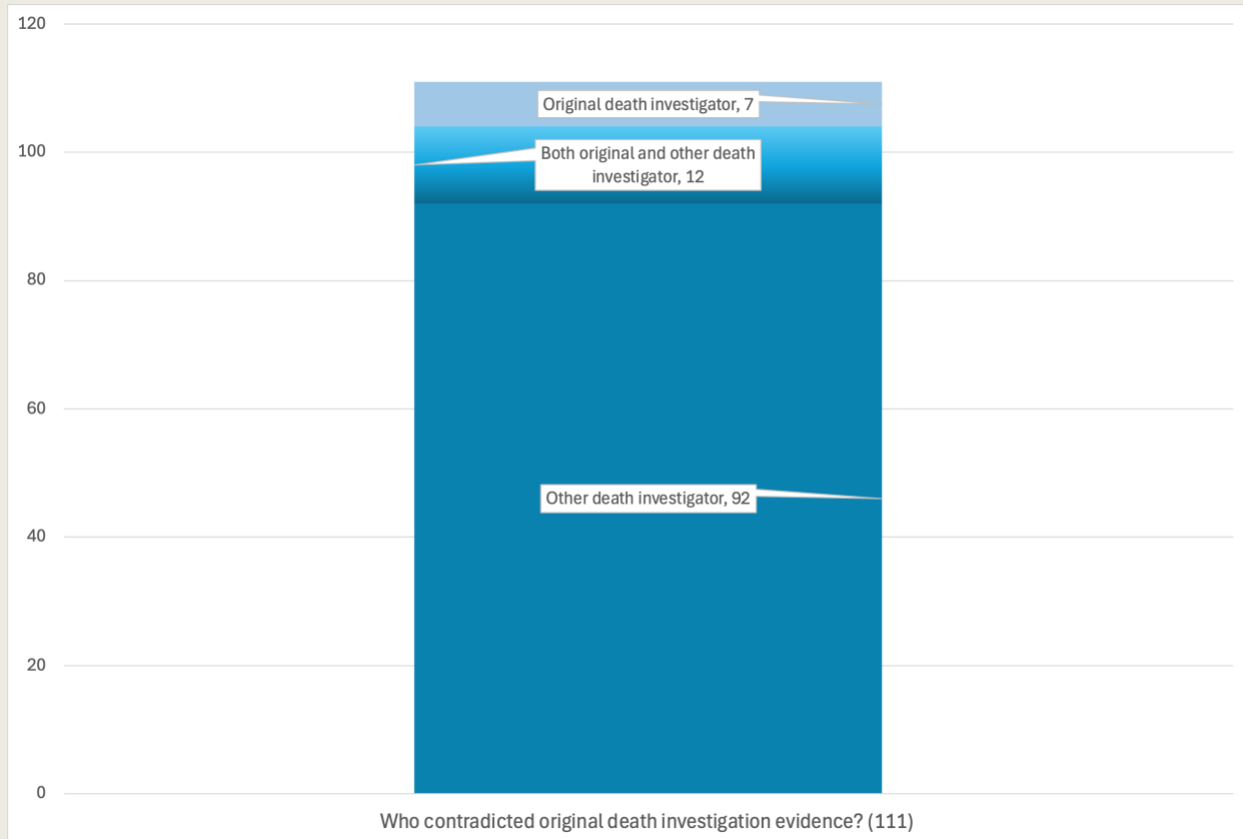


Figure 22. Identity of contradictor in contradiction cases. Column total shown in parenthesis.

For example, in the convictions of [Teresa Engberg-Lehmer](#) and [Joel Lehmer](#) for manslaughter of their 3-month-old son, Jonathan, in 1997, board-certified forensic pathologist

Dr. Thomas Bennett, the Iowa State Medical Examiner, performed an autopsy and declared the child’s death a homicide. The cause, Bennett said, was Shaken Baby Syndrome. Jonathan, he concluded, had been violently shaken to death by one or both of his parents.

However, post-conviction, the Lehmers’ lawyer

sent the case file to Dr. Peter Stephens, an Iowa City [board-certified forensic] pathologist, who studied the records and concluded there was no evidence of shaken baby syndrome. The child had died of Sudden Infant Death Syndrome, Stephens concluded.

Stephens’s report was given to Pottawattamie County Attorney Rick Cowl, who then sent the file to Dr. Jerry Jones, an Omaha forensic pathologist. Jones agreed with Stephens—there was no evidence the baby had been shaken.

The Lehmers were exonerated in 1998.

The conviction of [Carrody Buchhorn](#) for murder in Kansas in 2018 took “contradiction” to a new level in that the coroner posited a theory that other experts found literally absurd.

The charge was based on the conclusion of the Douglas County Coroner, [board-certified forensic pathologist] Dr. Erik Mitchell, that Oliver had died from a blow to the head.

At a preliminary hearing, Dr. Mitchell testified that Oliver had a skull fracture. However, there was no brain swelling, which would typically accompany such an injury. Dr. Mitchell testified that Oliver had died instantly following a blow to the head, which he claimed released mechanical energy into the base of the brain causing “temporary cessation of function at the base of the brain” or “depolarization of neurons.” Dr. Mitchell suspected that the baby had been stepped on.

He said he believed, “going on statistics,” that Oliver died instantaneously due to “a direct effect on depolarization of neurons at the area of the base of the brain, upper spinal cord manila, [which] interferes with the ability to breathe, and that leads to death.” He concluded Oliver had no “anatomic deformity or no anatomic reason to be dead other than the physical injury, and that this physical injury will release energy into the area that is critical for survival at the base of the brain.”

In July 2018, Buchhorn went to trial in Douglas County District Court. Dr. Mitchell testified that there was not much time between the trauma which caused the skull fracture and Oliver’s death. Since Buchhorn was the last person to care for Oliver, she had to have been responsible, Dr. Mitchell testified.

However, post-conviction, among several witnesses who criticized Mitchell’s testimony,

Dr. Sudha Kessler, a licensed physician and board-certified pediatric neurologist at the University of Pennsylvania Children’s Hospital in Philadelphia, testified that Dr. Mitchell’s depolarization theory was unreliable. She testified that some energy, such as electrical or electromagnetic, can impact the signals of the brain cells, but not kinetic or mechanical energy, such as a force from a blow to the head. Dr. Kessler was “not aware of any circumstances in which mechanical energy directly translates into electrical change in the brain.”

Dr. Kessler said she had never heard or read about a brain death with no evidence of brain injury. Dr. Kessler said she had reviewed texts, published studies, and other sources of medical research, but she found no support for the proposition that mechanical energy can depolarize, interfere with, or disrupt the brain cells or nerves and cause instant death, without causing injury to the brain. Dr. Kessler also reviewed literature Dr. Mitchell had produced after the trial. She said she did not believe it supported Dr. Mitchell’s theory.

Dr. Kessler called Dr. Mitchell’s theory “just fantastical, because it’s not something I have ever been taught, not something I teach, not something—just not consistent. It’s not consistent with the medical literature because there is no literature on magical disruption of the brain that causes death and that doesn’t exist. In addition to looking through my own textbooks, looking through the two database searches I did, I was so taken aback by all this

that I ... [asked] my colleagues if they have heard of this idea; and honestly, most of the time, the response that I got was laughter.”

Buchhorn was exonerated in 2022.

In seven cases, no other death investigator contradicted the original death investigator, but the original death investigator themselves recanted their original evidence.

For example, in the conviction of [Emerson Stevens](#) for the murder of Mary Harding in Virginia in 1986, Harding’s “lower back had four parallel slices and there were several lacerations across her buttock.” Board-certified forensic pathologist

Dr. Marcella Fierro with the state’s Office of the Chief Medical Examiner had signed off on the autopsy in early September. But on September 30, she amended [the autopsy] report and added that the slices along Harding’s back were made by a “cutting instrument.” She wrote that the cuts weren’t made post-mortem but were – along with strangulation – a cause of death.

At trial,

Fierro testified about the autopsy and the cause of death. She said the wounds on Harding’s body were “due to a cutting instrument” and that a Wildcat Skinner could have caused those injuries. During cross-examination, [defense attorney James] Parker showed Fierro a propeller and asked her whether it could have caused the wounds. She said that the propeller he showed her could not have caused the cuts.

Postconviction,

Fierro . . . recanted her testimony on May 13, 2016. In her affidavit, Fierro said she reviewed the case file at the request of Stevens’s attorneys and consulted with a listserv of medical examiners. “I now believe that my initial opinion and trial testimony in reference to the cutting injuries was in error. The periodicity, location, depth, and extent of the wounds on Ms. Harding’s body are more consistent with a propeller and inconsistent with a knife.”

In 12 additional cases, both another death investigator and the original death investigator themselves contradicted the original evidence. Thus, other death investigators contradicted the original death investigator in a total of 104 cases, and the original death investigator contradicted their own initial evidence in a total of 19 cases (Figure 22).

An example of one of the 12 cases in which both another death investigator and the original death investigator contradicted the original evidence is the conviction of [Randy Liebich](#) for the murder of his girlfriend’s son, Steven, in Illinois in 2004:

Dr. Darinka Mileusnic-Polchan, a [board-certified] forensic pathologist [for the NAME accredited Cook County Medical Examiner], testified that she performed an autopsy on

Steven on February 12. She documented more than 40 bruises and other marks. Some of the bruises appeared to be healing. She said the wounds were not consistent with being struck by a belt—except for one mark on his buttocks. She testified that the wounds were consistent with being whipped with a plastic clothes hanger.

Mileusnic-Polchan said she found a three-inch hemorrhage under the skin of Steven’s head, indicating blunt force trauma. She said she found a significant subdural hemorrhage on the left side of his head. She said that because surgery was performed on the right side of Steven’s head, she could not reach any conclusions about possible injuries there.

She said she found a perforated bowel and a hemorrhage around the head of the pancreas—both resulting from blunt force trauma. The injuries were consistent with child abuse and with Steven being beaten to death, she declared.

However,

The defense also called Dr. Shaku Teas, a forensic pathologist and child abuse expert who had testified hundreds of times for prosecutors and fewer than two dozen times for defendants. Teas told Judge Ann Jorgensen that she agreed with Mileusnic-Polchan that Steven’s death was caused by multiple blunt trauma injuries. The injuries to his abdomen were the result of punching, hitting, kicking, or some kind of crushing mechanism.

However, Teas said, a victim might experience pain for a while and then appear to be normal. Meanwhile, the perforated bowel was leaking and peritonitis would set in. She said that she believed the injuries all occurred around February 6. She also said that what Liebich thought was choking on a hot dog was a seizure caused by either a previously sustained head or abdominal injury.

Postconviction,

In 2012, Mileusnic-Polchan gave a sworn affidavit saying that at the time she performed the autopsy, she had already accepted a job as deputy medical examiner for Knox County, Tennessee. When she returned in 2004 to testify at Liebich’s trial, she did not review the medical records, but testified from her autopsy report.

“Although it is routine to order medical records, I do not believe that I received the medical records in this case before completing the report and leaving for Tennessee,” she said. “I did not have an opportunity to review the slides, photographs or medical records before testifying at trial in 2004.”

She said that after reviewing the medical records in 2012 at the request of Liebich’s lawyers, she discovered a surgical report that she had never seen. That report established “that the massive subdural hemorrhage...did not exist.” Mileusnic-Polchan said that a review of autopsy slides showed that Steven had acute pancreatitis resulting from injuries prior to February 8, 2002, the day that Liebich was babysitting.

“Given the pathology, it was improbable that any injuries occurred on February 8. Instead, the child’s collapse appeared to be the end result of a process that began days earlier,” Mileusnic-Polchan said.

The medical records showed that Steven was taken to surgery for evacuation of a large subdural hemorrhage based on the CT scan. However, “little or no subdural hematoma was found during surgery,” she said.

Mileusnic-Polchan said that the records showed that as a result of the pancreatitis, Steven’s body had lost the ability to regulate bleeding and clotting, resulting in “easy bruising.” That explained the sudden appearance of bruises that were believed at the time to be the result of child abuse, Mileusnic-Polchan concluded.

“My recent review of the autopsy slides confirms that the child had myocarditis (damaged heart cells) and an older pancreatic injury (at least 10 days old) that would have made him more vulnerable to trauma or infection...There is no indication of trauma on the day of admission,” Mileusnic-Polchan said.

Liebich was exonerated in 2019.

Cases such as this have been the basis for so-called “changed science” or “shifted science” claims that have now been written into law in at least seven states.¹³⁸ In Texas, the conviction of [Neal Robbins](#) for murder in 1999 became the basis for a new law on changed science:

Dr. Patricia Moore, an assistant medical examiner for the Harris County Medical Examiner’s office, testified that she performed an autopsy and concluded, based on several contusions on Tristen’s back as well as areas of discoloration on her arm, face, and neck, that Tristen had died of suffocation by compression. Moore said she found internal hemorrhages as well. Moore told the jury that she ruled out CPR as the cause of death because the injuries to the back were inconsistent with resuscitation efforts and because the internal hemorrhages were caused by application of considerably more force than typical CPR efforts.

The defense called Dr. Robert Bux, the deputy chief medical examiner for Bexar County, who testified that the cause of death could not be determined. He said the injuries cited by Moore could well have been the result of CPR efforts. Bux also testified that EKG reports showed some electrical activity after 5:30 p.m., evidence that he said indicated the child was still alive after Robbins left the home.

¹³⁸ <https://www.law.umich.edu/special/exoneration/Pages/Forensics.aspx> (<https://perma.cc/S7UX-YK9U>); Caitlin Plummer & Imran Syed, *‘Shifted Science’ and Post-Conviction Relief*, 8 Stan. J. Civ. Rts. & Civ. Liberties 259 (2012); Caitlin Plummer & Imran Syed, *‘Shifted Science’ Revisited: Percolation Delays and the Persistence of Wrongful Convictions Based on Outdated Science*, 64 Clev. St. L. Rev. ____ (2016); Valena E. Beety, *Changed Science Writs and State Habeas Relief*, 57 Hous. L. Rev. 483 (2020); Jennifer E. Laurin, *Criminal Law’s Science Lag: How Criminal Justice Meets Changed Scientific Understanding*, 93 Tex. L. Rev. 1751 (2015); Simon A. Cole, *Changed Science Statutes: Can Courts Accommodate Accelerating Forensic Scientific and Technological Change?*, 57 Jurimetrics 443 (2017).

However, post-conviction,

In March 2007, an acquaintance of Robbins asked the Harris County Medical Examiner’s Office to review Moore’s finding of the cause of Tristen’s death. The deputy chief medical examiner, Dr. Dwayne Wolf, re-evaluated the autopsy findings and concluded that the autopsy did not support a finding of death by asphyxiation by compression. Wolf amended the autopsy report to say that the cause and manner of death was “undetermined.”

As a result, the inquest into Tristen’s death was formally re-opened and shortly thereafter, former Harris County Medical Examiner Joye Carter—who had been Moore’s supervisor at the time Moore conducted the autopsy—reviewed the case and in a May 10 letter to the Montgomery County District Attorney said she would consider the case as “undetermined” as well.

The prosecution asked Moore to review the case, and in a May 13 letter to the prosecution, Moore said that while she believed the death was suspicious, “having had more experience in the field of forensic pathology, I now feel that an opinion for a cause and manner of death of undetermined...is best for this case.”

Moore said that in the ensuing nearly 10 years, she had had more experience and had reviewed additional information that suggested the bruises could have resulted from aggressive CPR, particularly by untrained individuals, and other efforts to save the child.

Still, Robbins could not find legal relief until the state legislature passed the first “changed science” statute in the country in 2013. Robbins was exonerated in 2016.

At the time of Robbins’s trial, Moore was board certified in anatomic and clinical pathology, but not forensic pathology. However, she received her board certification in forensic pathology in 2000, one year after Robbins’s conviction and sixteen years before his exoneration.

2. OVERSTATEMENT

“Overstatements,” in which the forensic expert overstates the probative value of the evidence, are obviously problematic. As one forensic pathologist has commented, “The paradigm of poor expert evidence is the witness who overstates opinions.”¹³⁹ As doctors, most death investigators may be less prone to overstatement than forensic experts in other disciplines. Doctors are accustomed to the uncertainties inherent in inferring causation about human biological conditions and differential diagnoses. Perhaps for this reason, overstatements were relatively rare in death investigation cases. Nonetheless, they did occur in 20 cases. For example, in the conviction of [Cesar Munoz](#) for murder of his common-law wife in Chicago in 1997, board-certified forensic pathologist Nancy Jones, of the NAME accredited Cook County Medical Examiner,

¹³⁹ Cordner, *Forensic Pathology and Miscarriages of Justice*, 318.

who performed the autopsy testified that although the wound was a close contact wound, she believed “beyond a reasonable doubt” that the death was a homicide because the location (shot through the lip) and appearance of the wound were not indicative of suicide. The pathologist said she was also influenced to believe the death was a homicide because the gun was moved and the body was dragged face down on the floor from the bedroom.

Munoz, who claimed his wife had locked herself in a room and shot herself, was acquitted by a judge at his fourth trial in 2013 based on evidence from a locksmith, a child psychologist, and gunshot residue suggesting the death was a suicide.

3. VAGUE

In 20 cases, however, death investigation evidence was neither contradicted nor overstated, but still contributed to the conviction. For example, a death investigator might say that the evidence was “consistent with” some cause of death, or that something “could have” have been the cause of death. What are we to say about the death investigation evidence in such cases? Such statements are difficult to falsify. Even if post-conviction evidence strongly points toward the defendant’s innocence, the death investigator was not necessarily wrong to say that the evidence was “consistent with” the defendant’s guilt. The evidence could be “consistent with” the defendant’s guilt, and the defendant could nonetheless happen to be innocent.

We argue that the “problem” with such evidence is that it was “vague” in the first place. Evidence that is “consistent with” many different possible factual scenarios arguably gives the factfinder too little information to be useful in court. Such evidence can fit nearly any theory of the crime.

An example is the conviction of [Gregory Hobbs](#) for manslaughter in New Mexico in 2013. Hobbs claimed he shot the victim, Ruben Archuleta, Sr., in self-defense. At trial,

A pathologist with the state’s Office of the Medical Examiner testified that an autopsy showed Ruben Sr. was shot four times. He said the fatal shot was fired at a downward angle into the left side of Archuleta’s chest from a distance of six to eight inches. A second shot entered the bridge of Archuleta’s nose from two to three feet away. A third shot grazed Archuleta’s right shoulder, and a fourth shot hit him on the right side of the chest.

The pathologist also testified that Archuleta’s shirt had to have been pulled down in order to match a hole in the shirt with the wound on the left side of his chest. He said this suggested that Hobbs was holding the shirt.

The use of the term “suggested” prevents this from being an overstatement of the probative value of the evidence. The death investigator was not claiming to know that Hobbs was holding the victim’s shirt, only that the evidence suggested it. However, how strongly the evidence suggested that, and how strongly it might have suggested other explanations that were not mentioned, was not stated. This is problematic because the factfinder was left having to guess how strongly the evidence supported competing theories of the crime. For this reason, we call this evidence “vague.” The evidence was not discriminating enough to provide the factfinder with useful information to weigh

the competing theories of the crime, but the factfinder probably interpreted the evidence as probative of guilt.¹⁴⁰

VI. CONCLUSION

Death investigation continues to contribute to false convictions. After completion of the analysis for this report, at least 8 new exonerations have already occurred in which death investigation contributed to the false conviction including [Shawn Schweitzer](#), [Edward Ramirez](#), [Ricky Dority](#), [Alan Butts](#), [Chad Marcum](#), [Mason Shannon](#), [Marvin Grimm](#), and [Connie Dahl](#). And there is always more to be learned about known exonerations. In at least one case, ([Ricky Davis](#)) after analysis we learned that death investigation had contributed to a long-known exoneration case.

As noted above, death investigation in the US has been contested for more than a century. Today, many proposals for improving death investigation continue to circulate. These include replacing coroner systems with medical examiner systems; expanding the use of state medical examiners; centralizing state medical examiner systems; replacing elected with appointed death investigators; eliminating conflicts of interest raised by death investigation systems run by “other officials,” such as county attorneys or law enforcement officials; recruiting more physicians to specialize in forensic pathology; requiring that all autopsies and death investigation be performed by board-certified forensic pathologists; eliminating the use of manner of death opinions in criminal proceedings; mitigating cognitive bias in death investigation; addressing issues of racial bias in death investigation; and eliminating or limiting the use of the SBS and AHT diagnoses which essentially require the accusation of the last known caregiver in child deaths involving certain symptoms. Commenting on these reform proposals is outside our expertise and the scope of this report. Our expertise is in exonerations, not death investigation. Nonetheless, the exoneration cases described in this report and in the Registry’s pages suggest the wide variety of ways in which death investigation can contribute to false convictions and several target areas to consider in improving death investigation in the US.

It is clear that female defendants are especially vulnerable to death investigation evidence. Similarly, cases involving the killing or harming of children are vulnerable to false conviction. Relatedly, it is clear that the Shaken Baby Syndrome and Abusive Head Trauma diagnoses are a particular problem area for death investigation. That said, these controversial diagnoses are not the whole problem; they account for only one fifth of the cases in which death investigation contributed to false convictions.

A number of quality assurance guardrails have been proposed to improve death investigation. These include the replacement of coroners with medical examiners, accreditation, and greater reliance on board-certified forensic pathologists, which itself depends on remedying the longstanding shortage of forensic pathologists in American medicine. Our findings show that useful as these measures may be, none of them promise to eliminate the contribution of death

¹⁴⁰ For more technical accounts of why this evidence is problematic, see Thomas D. Lyon & Jonathan J. Koehler, *Relevance Ratio: Evaluating the Probative Value of Expert Testimony in Child Sexual Abuse Cases*, 82 Cornell L. Rev. 43 (1996-1997); Bernard Robertson et al., *Interpreting Evidence: Evaluating Forensic Science in the Courtroom* (2016).

investigation to false convictions. The best the discipline has to offer—accredited medical examiner offices and board-certified forensic pathologists—all contributed to their share, or more than their share, of false convictions.

Death investigators occupy a pivotal position in the criminal legal system and have substantial opportunities to prevent false convictions. Undoubtedly, in many cases they have done so. We cannot in this report address those cases. But, in this report, we are able to recount and describe those cases in which, tragically, death investigators failed to do so.

VII. APPENDICES

A. APPENDIX I: Exonerated Individuals for Whom Death Investigation Contributed to the Conviction

Table is sorted by year convicted, then alphabetically by county-state, then alphabetically by last name.

Last Name	First Name	Year convicted	County-State	County death investigation office type	Occupational identity of most qualified death investigator	Evidence type
Ausby	John	1972	District DC	Medical Examiner	Board certified	Evidence consistent with prosecution theory
Pardue	Michael	1973	Baldwin AL	Coroner	Toxicologist	Cause of death
Andrews	Isaiah	1975	Cuyahoga OH	Medical Examiner	Board certified	Time of death
Bush	Keith	1976	Suffolk NY	Medical Examiner	Board certified other pathology specialty	Evidence consistent with prosecution theory
Finch	Charles	1976	Wilson NC	Medical Examiner	Pathologist	Cause of death
DiNicola	Louis	1980	Erie PA	Coroner	Board certified	Evidence consistent with prosecution theory
Paradis	Donald	1981	Kootenai ID	Coroner	Board certified	Evidence consistent with prosecution theory
Brandley	Clarence	1981	Montgomery TX	Other County Official	Board certified	Evidence consistent with prosecution theory
Waters	Kenneth	1983	Middlesex MA	Medical Examiner	Board certified	Time of death
Marsh	Kenneth	1983	San Diego CA	Medical Examiner	Board certified other pathology specialty	Cause of death
Ford	Glenn	1984	Caddo LA	Coroner	Board certified other pathology specialty	Evidence consistent with prosecution theory
Arledge	Randolph	1984	Navarro TX	Other County Official	Board certified	Evidence consistent with prosecution theory

DEATH INVESTIGATION AND WRONGFUL CONVICTION

Last Name	First Name	Year convicted	County-State	County death investigation office type	Occupational identity of most qualified death investigator	Evidence type
Baran	Bernard	1985	Berkshire MA	Medical Examiner	Board certified other pathology specialty	Evidence consistent with prosecution theory
Banks	Gregory	1985	Cook IL	Medical Examiner	Board certified	Evidence consistent with prosecution theory
Munson	Adolph	1985	Custer OK	Medical Examiner	Board certified	Evidence consistent with prosecution theory
Hunt	Darryl	1985	Forsyth NC	Medical Examiner	Medical examiner	Evidence consistent with prosecution theory
DuBoise	Robert	1985	Hillsborough FL	Medical Examiner	Board certified	Bitemarks
Morales	Santiago Ventura	1986	Clackamas OR	Medical Examiner	Board certified other pathology specialty	Evidence consistent with prosecution theory
Browning	Paul	1986	Clark NV	Coroner	Board certified	Evidence consistent with prosecution theory
McNair	Daniel	1986	Lancaster SC	Coroner	Board certified	Manner of death
Stevens	Emerson	1986	Lancaster VA	Medical Examiner	Board certified	Evidence consistent with prosecution theory
Moore	Laurie	1987	Otsego MI	Medical Examiner	Pathologist	Cause of death
Ruby	Donald	1987	Perry PA	Coroner	Forensic pathologist	Time of death
Dziubak	Richard Paul	1987	Ramsey MN	Medical Examiner	Board certified	Manner of death
Morton	Michael	1987	Williamson TX	Other County Official	Board certified	Time of death
Dunn	Charlie	1988	Davidson TN	Medical Examiner	Board certified	Time of death
Watkins	Joyce	1988	Davidson TN	Medical Examiner	Board certified	Time of death
McKee	Dean	1988	Hillsborough FL	Medical Examiner	Pathologist who practiced forensic pathology but who was not board certified	Evidence consistent with prosecution theory

DEATH INVESTIGATION AND WRONGFUL CONVICTION

Last Name	First Name	Year convicted	County-State	County death investigation office type	Occupational identity of most qualified death investigator	Evidence type
Canter	Mark	1988	Otsego MI	Medical Examiner	Pathologist	Cause of death
Moore	Walter	1988	Otsego MI	Medical Examiner	Pathologist	Cause of death
Griffin	Reginald	1988	Randolph MO	Coroner	Medical examiner	Evidence consistent with prosecution theory
Fox, Sr.	Larry	1988	Scott IN	Coroner	Board certified	Cause of death
D'Ambrosio	Joe	1989	Cuyahoga OH	Medical Examiner	Board certified	Evidence consistent with prosecution theory
Ralston	Sean	1989	Middlesex MA	Medical Examiner	Board certified	Cause of death
Heistand	Donald	1989	Otsego MI	Medical Examiner	Pathologist	Cause of death
Loveless	Debbie	1989	Rains TX	Other County Official	Medical examiner	Evidence consistent with prosecution theory
Miller	John	1989	Rains TX	Other County Official	Medical examiner	Evidence consistent with prosecution theory
Butler	Sabrina	1990	Lowndes MS	Coroner	Board certified other pathology specialty	Cause of death
Phinney, Jr.	Roland	1990	Middlesex MA	Medical Examiner	Medical examiner	Evidence consistent with prosecution theory
Terens	Daniel	1991	Manitowoc WI	Coroner	Board certified	Cause of death
Rollins, IV	Offord	1992	Kern CA	Other County Official	Pathologist	Time of death
Souter	Larry Pat	1992	Newaygo MI	Medical Examiner	Board certified	Evidence consistent with prosecution theory
Brooks	Levon	1992	Noxubee MS	Coroner	Board certified other pathology specialty	Bitemarks
Monroe	Beverly	1992	Powhatan VA	Medical Examiner	Board certified	Manner of death
Benavides	Vicente	1993	Kern CA	Other County Official	Board certified	Cause of death
Cacy	Sonia	1993	Pecos TX	Other County Official	Board certified	Cause of death

Last Name	First Name	Year convicted	County-State	County death investigation office type	Occupational identity of most qualified death investigator	Evidence type
Williams	Christopher	1993	Philadelphia PA	Medical Examiner	Board certified	Evidence consistent with prosecution theory
Wilson	Theophalis	1993	Philadelphia PA	Medical Examiner	Board certified	Evidence consistent with prosecution theory
Beard	Jacob	1993	Pocahontas WV	Medical Examiner	Board certified	Cause of death
Graves	Anthony	1994	Burleson TX	Other County Official	Board certified	Evidence consistent with prosecution theory
DeJac	Lynn	1994	Erie NY	Medical Examiner	Board certified	Cause of death
Wilson	Sharrif	1994	Kings NY	Medical Examiner	Board certified	Time of death
Yarbough	Anthony	1994	Kings NY	Medical Examiner	Board certified	Time of death
Williams	Herman	1994	Lake IL	Coroner	Board certified	Time of death
Howard, Jr.	Eddie Lee	1994	Lowndes MS	Coroner	Board certified other pathology specialty	Evidence consistent with prosecution theory
Weaver	Mary	1994	Marshall IA	Medical Examiner	Board certified other pathology specialty	Cause of death
Vann	Gussie	1994	McMinn TN	Medical Examiner	Medical examiner	Manner of death
Weiner	Murray	1994	San Diego CA	Medical Examiner	Pathologist	Evidence consistent with prosecution theory
Hockersmith	Letha Jean	1994	Tulsa OK	Medical Examiner	Medical examiner	Cause of death
Brown	Debra	1995	Cache UT	Medical Examiner	Board certified	Manner of death
King	Evin	1995	Cuyahoga OH	Medical Examiner	Board certified	Evidence consistent with prosecution theory
Villegas	Daniel	1995	El Paso TX	Medical Examiner	Board certified	Evidence consistent with prosecution theory
Armstrong	LaMonte	1995	Guilford NC	Medical Examiner	Board certified	Cause of death

Last Name	First Name	Year convicted	County-State	County death investigation office type	Occupational identity of most qualified death investigator	Evidence type
Fritz	Judith	1995	Lehigh PA	Coroner	Board certified	Evidence consistent with prosecution theory
Brewer	Kennedy	1995	Noxubee MS	Coroner	Board certified other pathology specialty	Bitemarks
Baker	Kevin	1996	Camden NJ	Medical Examiner	Board certified	Evidence consistent with prosecution theory
Washington	Sean	1996	Camden NJ	Medical Examiner	Board certified	Evidence consistent with prosecution theory
Edmunds	Audrey	1996	Dane WI	Medical Examiner	Board certified	Cause of death
Tomaino	John	1996	Niagara NY	Coroner	Board certified	Manner of death
Ogrod	Walter	1996	Philadelphia PA	Medical Examiner	Board certified	Cause of death
Murray	Lacresha	1996	Travis TX	Medical Examiner	Board certified	Evidence consistent with prosecution theory
DeJesus	George	1997	Oakland MI	Medical Examiner	Board certified	Cause of death
DeJesus	Melvin	1997	Oakland MI	Medical Examiner	Board certified	Cause of death
Engberg-Lehmer	Teresa	1997	Pottawattamie IA	Medical Examiner	Board certified	Cause of death
Lehmer	Joel	1997	Pottawattamie IA	Medical Examiner	Board certified	Cause of death
DiPippo	Anthony	1997	Putnam NY	Coroner	Board certified	Time of death
Krivak	Andrew	1997	Putnam NY	Coroner	Board certified	Time of death
Gell	Alan	1998	Bertie NC	Medical Examiner	Board certified	Time of death
Clark	Darrell	1998	Floyd GA	Coroner	Coroner without MD	Evidence consistent with prosecution theory
Jones III	Clarence	1999	Baltimore MD	Medical Examiner	Board certified	Cause of death
Allen	Derrick	1999	Durham NC	Medical Examiner	Medical examiner	Cause of death
Burgess	Wayne	1999	Giles TN	Medical Examiner	Board certified	Cause of death
Robbins	Neal	1999	Montgomery TX	Other County Official	Board certified other pathology specialty	Cause of death

DEATH INVESTIGATION AND WRONGFUL CONVICTION

Last Name	First Name	Year convicted	County-State	County death investigation office type	Occupational identity of most qualified death investigator	Evidence type
Pettit	L. Lynn	1999	Vinton OH	Coroner	Board certified	Cause of death
Munoz	Cesar	2000	Cook IL	Medical Examiner	Board certified	Manner of death
Briggs	Brandy	2000	Harris TX	Medical Examiner	Board certified	Cause of death
Schweitzer	Albert Ian	2000	Hawaii HI	Other County Official	Board certified other pathology specialty	Bitemarks
Strong	Jason	2000	Lake IL	Coroner	Forensic pathologist	Evidence consistent with prosecution theory
Peak	Carolyn June	2000	Pima AZ	Medical Examiner	Medical examiner	Manner of death
Peel	John	2000	Pinellas FL	Medical Examiner	Board certified other pathology specialty	Cause of death
Zimmerman	Evan	2001	Eau Claire WI	Medical Examiner	Board certified	Evidence consistent with prosecution theory
Dorotik	Jane	2001	San Diego CA	Medical Examiner	Board certified	Evidence consistent with prosecution theory
Lobato	Kirstin	2002	Clark NV	Coroner	Board certified	Time of death
Jackson	Jeremy	2002	Cook IL	Medical Examiner	Medical examiner	Evidence consistent with prosecution theory
Newman	Rickey	2002	Crawford AR	Coroner	Medical examiner	Evidence consistent with prosecution theory
Skakel	Michael	2002	Fairfield CT	Medical Examiner	Board certified	Time of death
Witt	Drayton	2002	Maricopa AZ	Medical Examiner	Medical examiner	Cause of death
Johnson	Zavion	2002	Sacramento CA	Coroner	Board certified	Cause of death
Miller	Tonia	2003	Calhoun MI	Medical Examiner	Board certified	Cause of death
Hoover-Moore	Kim	2003	Franklin OH	Coroner	Board certified	Cause of death
Dendel	Katherine	2003	Jackson MI	Medical Examiner	Medical examiner	Evidence consistent with prosecution theory
Conley	Donna	2003	Perry OH	Coroner	Board certified	Cause of death

Last Name	First Name	Year convicted	County-State	County death investigation office type	Occupational identity of most qualified death investigator	Evidence type
Voss	Krystal	2004	Alamosa CO	Coroner	Pediatrician	Cause of death
Liebich	Randy	2004	Dupage IL	Coroner	Board certified	Cause of death
Rollin	Joseph Pierre	2004	Humboldt CA	Other County Official	Pathologist	Cause of death
Edmonds	Tyler	2004	Oktibbeha MS	Coroner	Board certified other pathology specialty	Evidence consistent with prosecution theory
Hales	Warren	2004	Salt Lake UT	Medical Examiner	Neurosurgeon	Evidence consistent with prosecution theory
Tiscareno	Abigail	2004	Summit UT	Medical Examiner	Pediatrician	Evidence consistent with prosecution theory
Ware	Melonie	2005	DeKalb GA	Medical Examiner	Board certified	Cause of death
Baumer	Julie	2005	Macomb MI	Medical Examiner	Pediatric radiologist	Cause of death
Ceasor	Terry	2005	St. Clair MI	Medical Examiner	Neurosurgeon	Cause of death
Jimenez	Rosa	2005	Travis TX	Medical Examiner	Board certified	Manner of death
Clark	Alphonso	2005	Wayne MI	Medical Examiner	Medical examiner	Evidence consistent with prosecution theory
Del Prete	Jennifer	2005	Will IL	Coroner	Board certified	Cause of death
Brown	LeeVester	2006	Coahoma MS	Coroner	Board certified other pathology specialty	Cause of death
Fish	Harold	2006	Coconino AZ	Medical Examiner	Medical examiner	Evidence consistent with prosecution theory
Hansen	Michael	2006	Douglas MN	Medical Examiner	Board certified	Cause of death
Miller	Dion	2006	Hudson NJ	Medical Examiner	Medical examiner	Evidence consistent with prosecution theory
Aguirre-Jarquín	Clemente	2006	Seminole FL	Medical Examiner	Board certified	Evidence consistent with prosecution theory
Holbrook	Matthew	2006	Wayne MI	Medical Examiner	Medical examiner	Evidence consistent with prosecution theory

DEATH INVESTIGATION AND WRONGFUL CONVICTION

Last Name	First Name	Year convicted	County-State	County death investigation office type	Occupational identity of most qualified death investigator	Evidence type
Epps	Derick	2007	Essex MA	Medical Examiner	Pediatrician	Evidence consistent with prosecution theory
Overton	Hannah	2007	Nueces TX	Medical Examiner	Board certified	Cause of death
Curley	Catina	2007	Orleans LA	Coroner	Board certified	Evidence consistent with prosecution theory
Stewart	Edward	2007	Philadelphia PA	Medical Examiner	Medical examiner	Evidence consistent with prosecution theory
Sommer	Cynthia	2007	San Diego CA	Medical Examiner	Board certified	Cause of death
Martinez	Rodrigo	2008	Orange CA	Other County Official	Medical examiner	Evidence consistent with prosecution theory
Hall	Paula	2009	Christian MO	Coroner	Medical examiner	Cause of death
Campbell	William	2009	Hamilton OH	Coroner	Board certified	Evidence consistent with prosecution theory
Debelbot	Albert	2009	Muscogee GA	Coroner	Board certified	Time of death
Debelbot	Ashley	2009	Muscogee GA	Coroner	Board certified	Time of death
Thomas	Adrian	2009	Rensselaer NY	Medical Examiner	Board certified	Cause of death
Coones	Olin	2009	Wyandotte KS	Coroner	Board certified	Manner of death
Brown	Shawn	2010	Calhoun MI	Medical Examiner	Board certified	Manner of death
Griffin	Michael	2010	Genesee MI	Medical Examiner	Board certified	Cause of death
Leath	Raynella Dossett	2010	Knox TN	Medical Examiner	Board certified	Manner of death
Council	Gregory	2011	Duval FL	Medical Examiner	Pediatrician	Cause of death
Gentry	Jacob	2011	Sussex NJ	Medical Examiner	Medical examiner	Cause of death
Alvarez	Ramon	2012	Orange CA	Other County Official	Board certified	Manner of death
Dunn, Jr.	Larry	2012	Racine WI	Medical Examiner	Board certified	Evidence consistent with prosecution theory

DEATH INVESTIGATION AND WRONGFUL CONVICTION

Last Name	First Name	Year convicted	County-State	County death investigation office type	Occupational identity of most qualified death investigator	Evidence type
Hopkins	Gregory	2013	Beaver PA	Coroner	Board certified	Evidence consistent with prosecution theory
Crawford	Rodricus	2013	Caddo LA	Coroner	Board certified	Cause of death
Hobbs	Gregory	2013	Chaves NM	Medical Examiner	Medical examiner	Evidence consistent with prosecution theory
Cash	Elgerie	2013	Paulding GA	Coroner	Board certified	Manner of death
Weathington	Jennifer	2013	Paulding GA	Coroner	Board certified	Manner of death
Truman	Conrad	2014	Utah UT	Medical Examiner	Board certified	Manner of death
Lyman	Christopher	2015	Geary KS	Coroner	Board certified	Cause of death
Hayden	Courtney	2015	Nueces TX	Medical Examiner	Board certified	Evidence consistent with prosecution theory
Shaw	Willie	2016	Mecklenburg NC	Medical Examiner	Board certified	Cause of death
Krukowski	Dane	2016	Saginaw MI	Medical Examiner	Neurosurgeon	Evidence consistent with prosecution theory
Stevens	Codie Lynn	2016	Saginaw MI	Medical Examiner	Neurosurgeon	Evidence consistent with prosecution theory
Buchhorn	Carrody	2018	Douglas KS	Coroner	Board certified	Cause of death

B. APPENDIX II: DATA TABLES

Table 5. Year of exoneration in death investigation and the comparison set.

Year of exoneration	Comparison set	Death investigation cases
1989	23	1
1990	30	2
1991	39	2
1992	40	1
1993	37	3
1994	31	3
1995	41	2
1996	49	4
1997	51	3
1998	37	2
1999	57	2
2000	112	2
2001	94	4
2002	65	2
2003	117	2
2004	55	3
2005	64	3

2006	78	1
2007	77	2
2008	65	8
2009	104	4
2010	98	2
2011	76	3
2012	118	2
2013	100	6
2014	152	5
2015	171	4
2016	180	5
2017	164	9
2018	174	6
2019	147	8
2020	130	12
2021	149	11
2022	232	13
2023	84	9
Grand Total	3241	151

Table 6. Percentage of death investigation and non-death investigation cases by year of conviction from 1972 the year of the first conviction to which death investigation contributed through 2018, the year of the last.

Year	Death investigation cases	Comparison Set	% death investigation
1972	1	4	25
1973	1	6	17
1974	0	4	0
1975	1	10	10
1976	2	10	20
1977	0	15	0
1978	0	9	0
1979	0	8	0
1980	1	15	7
1981	2	15	13
1982	0	23	0
1983	2	24	8
1984	2	26	8
1985	5	29	17
1986	4	36	11
1987	4	41	10
1988	7	36	19
1989	5	39	13
1990	2	47	4
1991	1	36	3
1992	4	47	9
1993	5	42	12
1994	10	47	21
1995	6	74	8
1996	6	62	10
1997	6	62	10
1998	2	51	4
1999	5	37	14
2000	6	29	21
2001	2	26	8
2002	6	33	18
2003	4	23	17
2004	6	15	40

DEATH INVESTIGATION AND WRONGFUL CONVICTION

Year	Death investigation cases	Comparison Set	% death investigation
2005	6	29	21
2006	6	19	32
2007	5	21	24
2008	1	15	7
2009	6	19	32
2010	3	19	16
2011	2	22	9
2012	2	9	22
2013	5	19	26
2014	1	11	9
2015	2	7	29
2016	3	9	33
2017	0	4	0
2018	1	4	25
Grand Total	151	1188	