

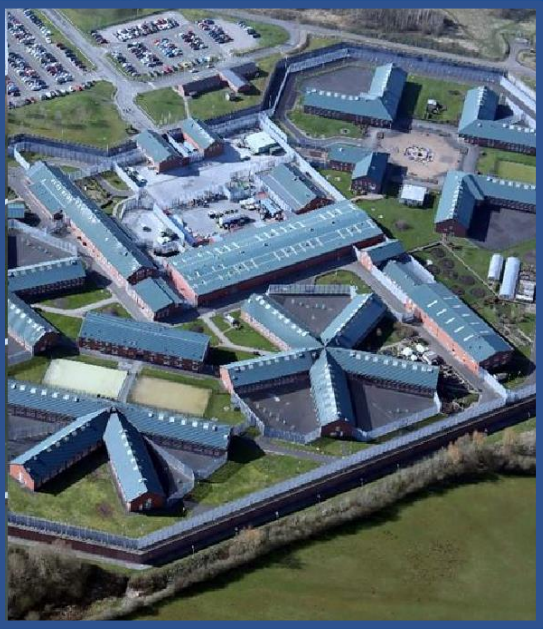

Understanding and Reducing Deaths in Custody

Interim Report

Prepared for

Benjamin Adams, Program Manager
National Institute of Justice
Office of Justice Programs
U.S. Department of Justice

June 2024

RTI Project Number 0218273.000

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This report is one in a series conducted for the National Institute of Justice (NIJ) Death in Custody Reporting Act (DCRA) Study under contract GS-00F-354CA.

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Acknowledgments

This report is the result of an ongoing effort that has benefited from the assistance of many individuals. We would first like to thank the panel of subject matter experts who took the time to review and provide valuable feedback on this report. In particular, we would like to thank study consultants Mr. Joseph Russo and Dr. David Klinger for contributing their time and expertise to improving the quality of this report.

Additionally, we would like to thank the many staff of the Bureau of Justice Assistance (BJA), the Bureau of Justice Statistics (BJS), and the National Institute of Justice (NIJ) who provided their attentive review and thoughtful feedback throughout the development of this report. Within the NIJ, we would especially like to thank Benjamin Adams, who serves as the project monitor under Director Nancy La Vigne, for his careful review of every iteration of this report and his continual guidance on the study at large.

Opinions or conclusions expressed in this paper are those of the authors and do not necessarily reflect the official position or policies of the U.S. Department of Justice. Any remaining errors or omissions within this report are the responsibility of the authors.

Finally, this work would not be possible without the efforts of the many individuals who collect and report data on deaths in custody at the local, state, and national levels. This includes the researchers who published the work on which much of this report is based.

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Executive Summary

Introduction

In 2019, approximately 1,800 persons died during interactions with law enforcement officers (1,000 of which were officer-involved shootings), 1,200 died while in jail, and another 3,853 died while serving time in state prison. The reason for these deaths varies across sectors. Law enforcement–related deaths most often involve officer shootings, while suicide and intoxications are leading causes of jail deaths. In prison, illness due to natural ailments such as heart disease and cancer are the leading causes of death.

This report is part of the Death in Custody Reporting Act (DCRA) Study, which is designed to generate significant advances in the knowledge and understanding of deaths in custody and to develop recommendations that support efforts to prevent and reduce such deaths.[1] In the context of law enforcement, any deaths that occur during an interaction with law enforcement (i.e., arrest-related deaths [ARDs]) fall within the DCRA scope, not only deaths occurring after an individual has been taken into custody. The DCRA Study is conducted pursuant to the requirements set forth in the 2014 reauthorization of the Death in Custody Reporting Act (DCRA 2013), which requires the Attorney General to conduct a study and submit a report to Congress to "(A) determine means by which such information can be used to reduce the number of such deaths, and (B) examine the relationship, if any, between the number of such deaths and the actions of management of such jails, prisons, and other specified facilities relating to such deaths" (see 34 U.S.C. § 60105 (f)(1)(A) & (B)).

All DCRA Study activities are organized by the three main contexts in which deaths in custody occur: law enforcement, jails, and prisons. Each context presents distinct prevalence rates; common causes and manners of death; and situational factors that demand different practices, policies, and solutions to reduce these deaths. For example, law enforcement officers engage members of the public in an open environment whereas jails and prisons are highly regulated and closed custody settings. The prevalence of ARDs, deaths occurring in jail and prison settings, and the policies and practices associated with reducing these deaths are explored in more detail in separate sections.

The challenges to conducting such a study are grounded in the disparate data collection systems across the tens of thousands of law enforcement, detention, and correctional agencies across the United States at the local, state, and federal levels. Collecting data on all manners of death—including homicides, suicides, accidents, and deaths because of natural causes—requires coordination with medical examiner and coroners' offices and other extant data

[1] The DCRA requires that states report to the Attorney General "information regarding the death of any person who is either; detained, under arrest, in the process of being arrested, en route to be incarcerated, or is incarcerated at a municipal or county jail, state prison, state-run boot camp prison, boot camp prison that is contracted out by the state, any state or local contract facility, or other local or state correctional facility (including any juvenile facility)" (Public Law 113-242).

sources that can provide critical information on the context surrounding in-custody deaths. Similarly, the causes and correlates of these deaths are multifaceted and complex, and various study findings can lead to very different policy and practical implications for recommendations to, for example, prevent suicides in jails, de-escalate a police–public contact with an individual in mental health distress, provide adequate health care for aging prisoners, or coordinate with reentry service providers to provide a continuum of care for individuals pending release from custody.

Approach

The scope of this effort is a mixed-methods design that includes a national-level review and case studies at multiple sites. The report describes the national-level review, which consisted of an environmental scan and secondary analyses of existing deaths in custody data.

Environmental Scan

RTI International conducted an environmental scan of the scientific and gray literature describing or evaluating policies, practices, and available data related to deaths in custody. The objectives of the environmental scan were to identify key policies and practices within each sector that are important to understanding and reducing the number of deaths in custody. The environmental scan involved (1) a review of relevant reports and policies from federal, state, and local agencies; professional organizations; and academic journals to identify the prevalence and correlates of deaths in custody and strategies designed to reduce such deaths and (2) website scans of selected agencies and other organizations to identify enduring and emerging policies and practices related to deaths in custody.

Secondary Analysis

A key charge of the DCRA legislation is to examine national statistical data collections and programs about deaths in custody that could be used to inform strategies to reduce these deaths. The secondary analysis does not examine DCRA data collected by the Bureau of Justice Assistance (BJA). Department of Justice reports have shown that these data are incomplete in their coverage, with variation in how agencies and states are reporting these data and in many cases suffering from data quality issues such as missing key data elements.[2,3,4] When available, we analyzed other existing federal data to understand the prevalence, scope, and incident characteristics associated with these deaths. When comprehensive federal data were unavailable, we analyzed open-source data on deaths. Additionally, decedent data were linked

[2] U.S. Department of Justice. (2022). *Department of Justice implementation of the Death in Custody Reporting Act of 2013.* https://bja.ojp.gov/doc/DOJ-Implementation-of-DCRA-of-2013.pdf

[3] U.S. Department of Justice. (2023). *Death in Custody Reporting Act: State convening summary report* (NCJ 306152). https://bja.ojp.gov/doc/dcra-state-convening-summary-report.pdf

[4] The final research report produced under this study will include a discussion of the quality, coverage, and completeness by sector (i.e., law enforcement, jails, prisons) of data collected through the DCRA program by BJA, and to the extent possible, these data will be incorporated into analyses, conclusions, and recommendations.

to agency and community data sources, when applicable, to investigate the associations among agency characteristics, policies, practices, programs, and deaths.

In each section, descriptive, cross-sectional, and longitudinal statistical analyses were conducted. Each section shows the number, mortality rate (e.g., per 100,000 incarcerated individuals), and percent change of deaths by selected characteristics. The number of deaths describes the size of the problem, relative differences between groups, and trends over time. The mortality rate accounts for the size of the population and captures differences between groups and change over time. Multivariable analytical models were performed to examine the relationships between agency, facility, and community characteristics focusing on potential risk factors and practices associated with the manner of deaths. Detailed methods are provided below and in each section.

Limitations

Although these reports provide a relatively comprehensive broad overview of what is known about individuals who die while in custody, the findings and recommendations are limited by several factors. In many cases, the existing scientific literature is lacking in rigorous evaluations of many policies and practices across a variety of settings and populations. Furthermore, the secondary analysis was limited by aspects of the available data, which often varied in quality, coverage, and consistency over time or by a lack of data that would have strengthened the analysis and implications thereof. The secondary analysis also relied on primarily descriptive, cross-sectional analyses, meaning the relationships uncovered cannot be interpreted as causal. These limitations suggest using caution when interpreting the statistical associations and state of the evidence presented in each report.

Law Enforcement Arrest-Related Deaths

This section explores the factors and correlates of ARDs, or mortality occurring when an individual is detained, under arrest, or in the process of being arrested. To this end, the primary research questions guiding this section include the following:

1. How many people die each year during an interaction with law enforcement?
2. What are the demographic characteristics of people who die during an interaction with law enforcement?
3. What are the manners and causes of these deaths?
4. Under what circumstances do people die?
5. What agency characteristics are associated with these deaths?
6. Are community characteristics associated with these deaths?
7. What policies and practices are associated with these deaths?

To address these questions, RTI conducted a secondary analysis of data on ARDs from 2013–2020[5] obtained from the Fatal Encounters database and linked to agency-level data from the three most recent waves of the Law Enforcement Management and Administrative Statistics

[5] These years represent the most complete data on indicators of interest.

(LEMAS) survey (2013, 2016, and 2020). Both cross-sectional and longitudinal analyses were conducted on these linked data, with data availability limiting which years were included in each analysis. The environmental scan was conducted as a review of literature and agency policies and practices related to ARDs and use of force more generally. The full details of the methodological approach used in both the secondary analysis and the environmental scan of the literature are provided in the Law Enforcement section of this report.

Findings

There were an estimated 17,500 state and local law enforcement agencies in the United States as of 2018. These agencies vary in their organizational structures, size, and responsibilities and include sheriff's offices, local police departments, state law enforcement agencies, Tribal agencies, and constables or marshals.[6]

Prevalence and Characteristics of Arrest-Related Deaths

The DCRA Study is concerned with ARDs, or deaths occurring during an interaction with law enforcement. Deaths were considered as within the DCRA scope "when (1) the death results from police use of force, or (2) the event causing the death (e.g., self-inflicted injury, cardiac arrest, fall from a height, drowning, drug overdose) occurs while the decedent's freedom to leave is restricted by a law enforcement agency."[7]

- According to data collected through Fatal Encounters, the yearly prevalence of ARDs has increased between 2013 and 2020, with 1,778 deaths occurring in 2013 and nearly 2,100 deaths occurring by year-end 2020. This reflects a 17% increase over the 8-year period, with an average of 1,782 deaths per year.
- The total volume of ARDs occurring between 2013 and 2020 tends to concentrate among White individuals, men, and adults between the ages of 25 and 64.[8]
- The groups experiencing the highest *rates* of ARDs during this period are Black or African American individuals, men, and young adults aged 20 to 34. Additional analyses reveal that among Black men, decedents aged 25 to 34 and 35 to 64 had the highest shares in roughly equal proportion whereas among White men, decedents were mostly older (35 to 64).

[6] Gardner, A. M., & Scott, K. M. (2022). *Census of state and local law enforcement agencies, 2018—Statistical tables* (NCJ 302187). Bureau of Justice Statistics. https://bjs.ojp.gov/sites/g/files/xyckuh236/files/media/document/csllea18st.pdf

[7] Banks, D., Ruddle, P., Kennedy, E., & Planty, M. G. (2016). *Arrest-Related Deaths Program redesign study, 2015–2016: Preliminary findings* (NCJ 250112). U.S. Department of Justice, Office of Justice Programs, Bureau of Justice Statistics. https://bjs.ojp.gov/content/pub/pdf/ardprs1516pf.pdf

[8] The total volume of ARDs was highest among the age groups comprising 25- to-34-year-olds and 35- to-64-year olds, which together account for a much wider age span than other groups examined (e.g., 20- to-24-year olds). The total volume among these age groups is shown to illustrate the absolute number of deaths occurring in these substantively important age groups.

- Young people aged 15 to 19 years old as well as Native Americans and Alaska Natives also experienced elevated rates of ARDs, although the absolute number of deaths experienced by the latter group is relatively small.
- The cause of death during an interaction with law enforcement varies across age, race and ethnicity, and sex.
- Adults aged 25 to 34 years old experienced the highest rate of ARDs for all causes of death between 2013 and 2020, except for vehicle-involved deaths, in which they were exceeded by 20- to 24-year-old young adults.
- For shooting- and vehicle-involved deaths, Black or African American individuals experienced the highest rate of ARDs between 2013 and 2020 whereas American Indian or Alaska Native individuals were next.
- Men outpaced women in ARDs, regardless of the specific cause of death.

Circumstances of ARDs

- Most ARDs involved a decedent who was not fleeing.
- Most situations leading up to an ARD incident involved a person brandishing or using a weapon, with the next most frequent scenario involved the decedent exhibiting no aggressive movements during the encounter.
- Most decedents were armed during the encounter in which they died.
- Of individuals who were armed, the most common weapon was a firearm, followed by a knife or other edged weapon.
- The month and days of week during which ARDs were highest between 2013 and 2020 was in July and on Tuesdays through Fridays during the week.

Agency Characteristics

- In 2013 and 2016, most law enforcement agencies in the United States had no ARDs.
- During the same period, 5.4% of agencies had at least 1 ARD and 4.3% of agencies had at least 1 officer-involved shooting (OIS).
- Sheriff's offices tended to have higher rates of total ARDs and OISs than municipal police.
- Agencies with *more restrictive* use of force policies were associated with fewer ARDs and OISs per population served when controlling for sociodemographic context and violent crime rate of the community served.
    - For total ARDs, agencies not authorizing the use of batons, leg hobbles or other restraints, neck restraints, soft projectiles, and TASERs were associated with fewer ARDs per population served than agencies that authorized these force tactics for all personnel when controlling for sociodemographic context and violent crime rate of the community served.
    - For OISs, agencies not authorizing the use of batons, leg hobbles or other restraints, neck restraints, soft projectiles, and other chemical agents were associated with fewer OISs per population served than agencies that authorized

these force tactics for all personnel when controlling for sociodemographic context and violent crime rate of the community served.

- Agencies that did not require documentation for baton use were associated with fewer total ARDs and OISs, and agencies that did not require documentation for firearm use were associated with fewer ARDs.
- Agencies that did not have a website for citizens to report complaints were associated with fewer ARDs and OISs.
- Agencies with fewer White personnel were associated with more ARDs in the secondary analysis. The environmental scan of the scientific and gray literature found mixed evidence on the relationship between the demographic makeup of law enforcement agencies and officer use of force and ultimately ARDs. This secondary analysis finding also runs counter to some existing evidence that finds Black officers are less likely than White officers to use force. Differences in these findings may be driven, in part, by differences across studies in the unit of analysis (i.e., individual officer versus agency distribution), research design, and outcome of interest.

Ultimately, caution must be used in the interpretation of the associations noted above. Many of the findings are based on cross-sectional analyses, and some findings in particular diverge from what other research has found. The use of total population served to calculate rates of ARDs may also produce different findings than if other denominators were used, such as arrests or total police–public contacts.

Recommendations

Recommendation 1. Improve interactions between community members most at risk of ARDs and law enforcement, leveraging alternative response models when appropriate.

Recommendation 2. Implement de-escalation training and procedural justice training.

Recommendation 3. Continue to assess outcomes related to less-than-lethal uses of force (e.g., TASERs) and physical restraints (e.g., leg hobbles and neck restraints) and adjust policy restrictiveness accordingly.

Recommendation 4. Adjust officer recruitment policies to incentivize recruits with higher education experience.

Recommendation 5. Conduct more research on the full spectrum of police accountability mechanisms (i.e., oversight commissions, early intervention systems [EIS], bystander intervention, and duty to report policies) and their association with ARDs and implement those most effective at reducing ARDs in the near and long term.

Recommendation 6. Conduct more research on the individual, agency-level, and situational factors that are most associated with ARDs.

Jails

This section explores the prevalence and correlates of mortality in local jails and describes selected management practices and policies that may be associated with or are designed to reduce these deaths. The primary research questions include the following:

1. How many people die each year in U.S. jails?
2. Who dies in jail?
3. What are the manners and causes of these deaths?
4. Under what circumstances do people die?
5. What types of facilities are associated with these deaths?
6. Are community characteristics associated with these deaths?

To address these questions, RTI conducted a secondary analysis of deaths in jails using data spanning 2000 through 2019 from the Mortality in Correctional Institutions (MCI) data collection and agency data from three waves of the Census of Jails (COJ; 2006, 2013, and 2019). RTI also conducted an environmental scan of the literature to highlight salient correlates of these deaths. The methodological approach used in both the secondary analysis and the environmental scan of the literature are provided in more detail in the detailed separate report.

Findings

A jail is a confinement facility generally operated under the authority of a sheriff, police chief, or county or city administrator. Jails generally house individuals who are convicted of lesser crimes and serving sentences of less than a year; awaiting arraignment, trial, or other resolution of criminal charges; are in violation of the conditions of their probation, parole, or bail bond; or are being transferred to or from another secure facility. In 2019, there were 2,850 jail jurisdictions operating 3,116 public and private jail facilities. In 2000, these facilities had an average daily population of 597,900, rising to 781,000 in 2007 before steadily declining to 741,900 in 2019.[9]

Prevalence and Characteristics of Deaths in Jails

- In 2019, 1,200 individuals died while in the custody of local jails—a 5% increase from 2018 (1,138 deaths) and a 33% increase from 2000 (903 deaths).
- Since 2011, the jail mortality rate has steadily increased from 123 per 100,000 incarcerated individuals to a high of 167 per 100,000 in 2019.
- The predominant manner of jail deaths was illness, followed by suicide and intoxication.
    - The primary illness-related death is heart disease. From 2008 to 2019, the rate of heart disease deaths in jails steadily increased from 23 to 41 per 100,000 incarcerated individuals.

[9] Zeng, Z., & Minton, T. D. (2021). *Census of Jails, 2005–2019 – Statistical tables*. U.S. Department of Justice. https://bjs.ojp.gov/sites/g/files/xyckuh236/files/media/document/cj0519st.pdf

- In contrast to illness and suicide mortality rate, which have remained relatively stable over time, the alcohol/drug intoxication rate has more than quadrupled from 2000 to 2019, with most of the increase occurring in the past 7 years.
- Homicide and accidents account for a very small percentage of all jail deaths, each causing an average of 25 jail deaths per year.
- The populations with the most risk for death in U.S. jails as measured by mortality rate are White persons, persons ages 55 or older, persons incarcerated for violent offenses, and those who are unconvicted.
- The racial/ethnic differences were primarily driven by higher suicide rates for White persons.
- Older incarcerated persons primarily died from illness.
- Persons incarcerated for alleged or convicted violent offenses had higher mortality rates for illness and suicide.
- Although there were few differences in the mortality rates for males and females over time, their rates were driven by different manners of death. Males had a higher suicide rate whereas females had a higher drug/intoxication mortality rate.

Circumstances of Deaths

- Most jail deaths occur in a medical unit (50%) or in general housing (31%).
- The afternoon and evening hours appear to account for the majority of suicides, with the morning hours accounting for the fewest.
- In 2019, about 13% of persons who died by suicide stayed overnight in a mental health unit or were under observation at some point since their admission.

Agency and Community Characteristics

- Most jails did not report a death during the 3 years examined. However, the percentage of jails reporting one or more deaths increased steadily over the 3 years examined, up to 23% in 2019 from a low of 14.5% in 2000.
- In 2019, 90% of jails reported zero suicides, 95% reported zero intoxication deaths, and 99% reported zero homicides or accidents.
- Jails that did report a death during one of the examined years were not likely to report an additional death in the other years. A very small percentage of jails had multiple deaths each year, and this appears to have been driven primarily by jail size.
- The most significant factor related to jail deaths was the average daily population. Large jails had more deaths, but smaller jails had a higher mortality rate.
- Jails operating at greater than their rated 100% capacity were more likely to report at least one death and to have multiple deaths in 2019. This pattern also held true for suicide and intoxication deaths.

Recommendations

Recommendation 1. Identify and assess facility-based and individual risks for death for incarcerated individuals and implement plans to mitigate these risks.

Recommendation 2. Provide adequate staffing and regular health and emergency response training to all relevant jail staff or personnel.

Recommendation 3. Deliver immediate, consistent, and varied mental health care for individuals incarcerated in jails.

Recommendation 4. Leverage and integrate technology in jail operations to reduce mortality risk.

Recommendation 5. Conduct continual reviews and investigations of jail deaths to identify issues and make improvements.

Recommendation 6. Conduct more research on the individual, agency-level, and situational factors that are most associated with jail deaths.

State Prisons

This section explores the prevalence and correlates of mortality in prisons and describes selected management practices and policies that may be associated with or are designed to reduce these deaths. The primary research questions include the following:

1. How many people die each year in U.S. prisons?
2. Who dies in prison?
3. What are the manners and causes of these deaths?
4. What prison facility characteristics and programs are associated with these deaths?

To address these questions, RTI conducted a secondary analysis of existing mortality data spanning 2001 through 2019 from the MCI data collection as well as agency data from three waves of the Census of State and Federal Adult Correctional Facilities (2005, 2012, 2019). RTI also conducted an environmental scan of the literature to highlight salient correlates of these deaths. The methodological approach used in both the secondary analysis and the environmental scan of the literature are provided in more detail in the detailed separate report.

Findings

According to BJS, which conducts the annual Census of Adult Correctional Facilities, prisons are longer-term facilities that typically hold individuals convicted of felony offenses, parole violators, or individuals with sentences of more than 1 year. In 2019, there were 1,155 state-operated prisons and another 411 run privately facilities. Confinement facilities, those facilities where most individuals are not free to leave unaccompanied, made up 69% of all adult facilities and held about 95% of all incarcerated individuals in 2019.[10] Community-based facilities made up the remaining 31%.

[10] Community-based facilities are those that either report community corrections as their primary function or permit 50% or more of their prisoners to leave the facility unaccompanied. Confinement facilities are those in

The total number of individuals held in state prisons increased from 1.2 million in 2001 to a high of 1.3 million in 2008 before declining back to 1.2 million in 2019.[11] Additionally, over time, more individuals were serving longer sentences and more individuals 55 years old or older were sentenced to prison. These factors were associated with the aging of the prison population, such that individuals ages 55 or older began accounting for a larger percentage of the total population, posing challenges to identifying and addressing medical health needs.

Prevalence and Characteristics of Deaths in State Prisons

- The number of individuals who died while in the custody of state prisons declined 7% from 2018 (4,137 deaths) to 2019 (3,853 deaths).
- In 2001, the mortality rate in state prisons was 242 for every 100,000 incarcerated individuals. Beginning in 2010, the mortality rate increased every year, to a high of 347 per 100,000 in 2018, before declining to 330 in 2019.
- The predominant manner of death in state prisons is natural death caused by illness, followed by suicide and intoxication.
    - Cancer and heart disease are the primary illness-related causes of death.
    - AIDS-related deaths have fallen steadily since 2001, from a high of 275 deaths in 2001 to a low of 17 in 2019.
- State prison deaths caused by suicide, drug or alcohol intoxication, and homicide have increased significantly over time, and most of the increase has occurred during the past 5–6 years.
    - The suicide mortality rate increased from 14 per 100,000 incarcerated individuals in 2001 to a high of 27 in 2018.
    - Deaths due to intoxication increased from a rate of 3 per 100,000 incarcerated individuals in 2001 to 22 in 2019.
    - Deaths caused by homicide have increased from a rate of 3 per 100,000 incarcerated individuals in 2001 to 12 in 2019.
- White individuals accounted for the largest number of deaths in state prisons and had a higher mortality rate than Black and Hispanic individuals, and this disparity grew over time. Although Asian and American Indian/Alaska Native individuals account for 1% of all prison deaths, their mortality rates equal or exceed other race/ethnic groups.
    - Illness-related deaths account for a large proportion of the overall disparities between deaths among White individuals and deaths among people of other races/ethnicities.
    - White individuals also had higher rates for suicides, intoxication-related deaths, and homicides than Black and Hispanic individuals in state prisons.

which fewer than 50% of prisoners are permitted to leave the facility unaccompanied and do not report community corrections as their primary function.

[11] Carson, A. (2021). *Mortality in state and federal prisons, 2001–2019—Statistical – statistical tables* (NCJ 300953). U.S. Department of Justice, Office of Justice Programs, Bureau of Justice Statistics. https://bjs.ojp.gov/library/publications/mortality-state-and-federal-prisons-2001-2019-statistical-tables

- Males accounted for approximately 96% of all jail deaths in 2019 with 2,769 deaths, compared with 119 for females. The mortality rate for males was significantly higher than for females, and that difference increased over time and was higher for all manners of death (e.g., illness, suicide, intoxication, and homicide).
- The number of older persons dying in prisons has increased over time.
    - Beginning in 2001, the number of persons ages 55 or older dying in prison increased; it rose sharply starting in 2011 (972 deaths) and reached a high of 2,545 in 2018.
    - Similarly, the mortality rate for older persons was much greater than for other age groups. Older persons have much higher rates of death due to illness, such as cancer and heart disease.

Agency Characteristics

- In 2019, 54% of all prison facilities reported one or more deaths.
- Most prisons did not report a single suicide, intoxication, homicide, or accidental death in any year.
    - In 2019, 82% of prisons had zero suicides, 87% had zero intoxication deaths, 91% had zero homicides, and 97% had zero fatal accidents.
- Several facility characteristics were associated with higher mortality rates, and these differed by manner of death.
    - Facility functions were associated with mortality rates. For example, prison facilities equipped to address age-related diseases, such as cancer and heart disease, had higher rates for these types of death. Similarly, intoxication deaths appeared more pronounced in facilities that provided alcohol or drug treatment, whereas higher suicide rates were found in facilities with mental health and medical treatment. These associations suggest that facilities develop or adopt programs aligned with the needs of their populations or individuals with certain needs are assigned to facilities with certain services.
    - Few consistent patterns emerge between mortality rates and educational and work programs offered to incarcerated persons. For example, alcohol and drug dependency awareness programs were associated with higher rates of intoxication deaths. Additionally, the lack of education programs was associated with higher homicide and natural deaths. Like facility functions, these programs may be aligned and allocated to the populations most in need.
    - Security issues—as measured by several indicators related to disciplinary reports, assaults against staff, assaults against inmates, and disturbances—are generally associated with higher rates of homicide and suicide mortality.
- Interpretation of these associations is complicated because they may be confounded by other factors. For example, differences in mortality rates by prison facilities that are operated by the state and those that are run by a private organization could be driven by factors such as differences in the criminal history of the prison population served or

differences in staffing ratios. Although the differences between state and private operators are real and point to possible risk factors, other explanatory factors need to be considered.

Recommendations

Recommendation 1. Implement and assess multiple contraband detection technologies and procedures.

Recommendation 2. Implement and conduct risk assessment to improve the classification and service referral processes for incarcerated individuals, including reducing reliance on solitary confinement.

Recommendation 3. Implement mental health and suicide prevention strategies, with an emphasis on risk assessment.

Recommendation 4. Enhance correctional officer staffing, training, and protocols for responding to health care needs.

Recommendation 5. Support comprehensive health care access as recommended by national professional organizations.

Recommendation 6. Implement a comprehensive mortality review process.

Recommendation 7. Expand the use and role of oversight commissions to identify areas for improvement and to monitor progress toward objectives.

Recommendation 8. Collect better data and conduct rigorous studies of the predictors of mortality in prisons.

Conclusion

The findings presented in this interim report are derived from a broad review and analysis of what is known about ARDs and deaths that occur in jails and prisons and the policies, programs, and practices that may reduce these deaths. The recommendations are intended to encourage action by agencies and other system stakeholders to increase safety and reduce deaths based on existing evidence. However, better data, increased transparency, and more rigorous research are needed to advance our understanding of the effectiveness of such policies and practices and to develop appropriate implementation strategies for the different contexts in which deaths in custody occur.

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Acknowledgments

This report is the result of an ongoing effort that has benefited from the assistance of many individuals. We would first like to thank the panel of subject matter experts who took the time to review and provide valuable feedback on this report. In particular, we would like to thank study consultants Mr. Joseph Russo and Dr. David Klinger for contributing their time and expertise to improving the quality of this report.

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Opinions or conclusions expressed in this paper are those of the authors and do not necessarily reflect the official position or policies of the U.S. Department of Justice. Any remaining errors or omissions within this report are the responsibility of the authors.

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Introduction

Law enforcement agencies in the United States are charged with protecting and serving their communities, which can be framed using five interrelated activities or responsibilities: preserving the peace, protecting people and property, investigating crimes, preventing crime, and enforcing laws (Bouza, 1990). The majority of law enforcement agencies in the United States are state or local agencies. As of the 2018 Census of State and Local Law Enforcement Agencies (CSLLEA), there are approximately 17,500 state and local agencies operating in the United States, including sheriff's offices, local police departments, state police, tribal police, and constable or marshal agencies employing at least one full-time equivalent employee with general arrest powers (Gardner & Scott, 2022). Together, these 17,500 state and local agencies employed an estimated 788,000 full-time sworn officers and another 427,000 full-time civilian personnel (Gardner & Scott, 2022).

Sworn law enforcement officers in the United States have general arrest powers and engage in a multitude of activities that range from crime prevention activities to traffic control. This range of activities means that law enforcement regularly comes into contact with the communities they serve under a variety of different contexts. For instance, law enforcement officers made over 10 million arrests in 2019—495,900 for violent crimes and another 1 million for property crimes, with the remaining arrests for other offense types such as drug abuse violations, driving under the influence, simple assault, weapons carrying, or quality of life offenses such as vagrancy or disorderly conduct. More often, however, law enforcement engages with the public for reasons that do not involve an arrest. In 2020, law enforcement officers made contact with an estimated 53.8 million adults aged 16 and older residing in the United States, initiated through resident calls for assistance or law enforcement–initiated traffic or street stops (Tapp & Davis, 2022). There are millions of interactions that occur between the nation's law enforcement community and the general public each year. In some of these instances, it results in the death of the individual during their interaction with police—most often from use of force by officers but sometimes also from other means, such as crashing a vehicle during a police pursuit or from drug overdose. Deaths that occur during an interaction with law enforcement are termed arrest-related deaths (ARDs).

In recent years, there have been several widely publicized ARDs that have spurred considerable public discussion over police use of force. Some of these highly public incidents include the death of Michael Brown, who was shot and killed by Ferguson (MO) Police in 2014, and Breonna Taylor, who was shot and killed by Louisville (KY) Metro Police Department officers serving a warrant on her home in March 2020. In May of the same year, George Floyd was killed by a Minneapolis police officer who placed his knee on Floyd's neck for 9 minutes, eventually resulting in his death, and Tyre Nichols died in January 2023 after he was beaten by five Memphis Police Officers following a traffic stop. These incidents and others have often resulted in widescale protests coupled with calls to reform police practice to reduce police use of force and, ultimately, deaths resulting from police use of force.

These highly public incidents represent a small fraction of total deaths occurring during an interaction with law enforcement; however, the exact prevalence of ARDs in the United States is not known. The nation lacks a centralized, comprehensive source on the number and circumstances of deaths while in law enforcement custody (Feldman & Bassett, 2021).[1] However, consistent estimates have emerged from unofficial sources. For example, the Fatal Encounters database identifies 1,998 persons who died while in law enforcement custody or in pursuit by law enforcement in 2021. These deaths included being shot, tased, beaten, or asphyxiated, among others. The *Washington Post* database that focuses exclusively on fatal officer-involved shootings (OISs) reported 1,096 OIS deaths in 2022, an increase of roughly 10% since 2015. Understanding the key factors that contribute to ARDs, including OISs, is vital to reducing the occurrence of such deaths.

This report is part of the Death in Custody Reporting Act (DCRA) Study, which is designed to generate significant advances in the knowledge and understanding of deaths in custody and to develop recommendations that support efforts to prevent and reduce such deaths.[2] In the context of law enforcement, any deaths that occur during an interaction with law enforcement (i.e., ARDs) fall within the DCRA scope, not only deaths occurring after an individual has been taken into custody. The DCRA Study is conducted pursuant to the requirements set forth in the 2014 reauthorization of the Death in Custody Reporting Act (DCRA 2013), which requires the Attorney General to conduct a study and submit a report to Congress to "(A) determine means by which such information can be used to reduce the number of such deaths, and (B) examine the relationship, if any, between the number of such deaths and the actions of management of such jails, prisons, and other specified facilities relating to such deaths" (see 34 U.S.C. § 60105 (f)(1)(A) & (B)).

All DCRA Study activities are organized by the three main contexts in which deaths in custody occur: law enforcement, jails, and prisons. Each context presents distinct prevalence rates; common causes and manners of death; and situational factors that demand different practices, policies, and solutions to reduce these deaths. For example, law enforcement officers engage members of the public in an open environment whereas jails and prisons are highly regulated and closed custody settings. The prevalence of deaths occurring in jail and prison settings and the policies and practices associated with reducing deaths occurring in these settings are explored in more detail in separate reports. This report describes the prevalence and characteristics of ARDs and assesses the policies and practices designed to reduce such deaths. Deaths were considered as within the DCRA scope "when (1) the death results from police use

[1] This is true primarily for state and local agencies. For federal law enforcement, there is the Federal Law Enforcement Deaths in Custody Reporting Program (DCRP).

[2] The DCRA requires that states "report to the Attorney General information regarding the death of any person who is either; detained, under arrest, in the process of being arrested, en route to be incarcerated, or is incarcerated at a municipal or county jail, state prison, state-run boot camp prison, boot camp prison that is contracted out by the state, any state or local contract facility, or other local or state correctional facility (including any juvenile facility)" (BJA, 2022).

of force, or (2) the event causing the death (e.g., self-inflicted injury, cardiac arrest, fall from a height, drowning, drug overdose) occurs while the decedent's freedom to leave is restricted by a law enforcement agency" (Banks et al., 2016, p. 2). In particular, to gain a better understanding of the context and policies related to ARDs, RTI International conducted a two-phase analysis and review of the existing data and literature. Using data from the Fatal Encounters series extending from 2013–2020, RTI analyzed the prevalence, individual and agency characteristics, and circumstances associated with these law enforcement–related deaths. Concurrently, RTI conducted an environmental scan of the scientific and grey literature and current policies in place regarding law enforcement–related deaths.

Methodology

This report explores the factors and correlates of ARDs, or mortality occurring when an individual is detained, under arrest, or in the process of being arrested. To this end, the primary research questions guiding this report include the following:

1. How many people die each year during an interaction with law enforcement?
2. What are the demographic characteristics of people who die during an interaction with law enforcement?
3. What are the manners and causes of these deaths?
4. Under what circumstances do people die?
5. What agency characteristics are associated with these deaths?
6. Are community characteristics associated with these deaths?
7. What policies and practices are associated with these deaths?

Answers to these questions can point to potential populations, places, and practices most at risk for an ARD. Furthermore, examining change over time might reveal changes in risk for certain types of deaths, persons, or agencies. To answer these questions, RTI conducted a secondary analysis of existing mortality data using open-source data on ARDs and an environmental scan of the literature to highlight salient correlates of ARDs. The methodological approach used in both the secondary analysis and the environmental scan of the literature are provided in more detail in the subsequent sections below.

Secondary Analysis of ARDs

RTI conducted a series of analyses of ARDs, including descriptive, cross-sectional, and longitudinal analyses, to answer the key research questions. This section describes the specific data sources, variables, linking procedures, and analytic steps taken to conduct these analyses.

Data sources

Data on ARDs were obtained from the Fatal Encounters database. As previously noted, there is currently no official, comprehensive source of ARDs that occur in the United States each year (Banks et al., 2016; Feldman & Bassett, 2021). To fill this significant gap, crowdsourced data collections on ARDs have emerged in the past decade, where information on individuals who

die during an interaction with law enforcement is obtained through media reports and recorded in open-source databases. These databases include those like the Fatal Encounters database, *The Washington Post's* Fatal Force Database, and *The Guardian*'s The Counted database. These three examples collect and provide information on ARDs; however, the scope of *The Washington Post*'s and *The Guardian*'s databases are focused on OISs whereas the Fatal Encounters database includes a much wider scope to capture all individuals who die during an interaction with law enforcement and not just those who die as a result of an OISs. Thus, high-profile ARDs, such as those of George Floyd in Minneapolis and Eric Garner in New York City are not captured in *The Washington Post*'s shooting database but are captured in Fatal Encounters. Because the wider scope aligns more with the DCRA scope, the secondary analysis relied on ARD data obtained from the Fatal Encounters database.

Fatal Encounters records several key measures related to ARD incidents, including characteristics of the decedent; the agency or agencies involved; and characteristics of the incident, including the highest level of force used (i.e., the manner of death) and whether the decedent was armed or displayed aggressive behavior prior to their death. Although the Fatal Encounters database inevitably come with some limitations, relatively recent studies have demonstrated that the database provides the largest collection of data on ARDs in the United States to date (Finch et al., 2019), and findings from at least one study suggest it may provide reliable demographic characteristics of decedents as well (Feldman et al., 2017). For the purpose of this report, data on deaths occurring in 2013 through 2020 were obtained from the Fatal Encounters website, as these years represent the most reliably coded data from this source.[3] Using the Fatal Encounters data from this period, the descriptive analyses include a look at various characteristics of ARD incidents and decedents for the period between 2013 and 2020.

For the cross-sectional and longitudinal analyses, RTI aggregated Fatal Encounters data to the agency level and year of occurrence to prepare for linking with other data pertaining to characteristics of the agency involved in the ARD. Specifically, RTI merged the total count of ARDs and total count of OISs per agency occurring in 2013, 2016, and 2020 from Fatal Encounters with the 2013, 2016, and 2020 waves of the Law Enforcement Management and Administrative Statistics (LEMAS) survey (the three most recent waves available), using the name of the law enforcement agency involved and year of occurrence to match the data.[4] Because the LEMAS survey contains a sample of law enforcement agencies in the United States, not all agencies represented in the Fatal Encounters database were necessarily represented in

[3] The Fatal Encounters database includes deaths occurring from 2000 through the present day. However, variables coded for the earlier years of Fatal Encounters data may not be coded as reliably as more recent years' incidents. To mitigate issues related to the reliability of coding during earlier periods of the Fatal Encounters data, this report uses data from 2013 through 2020 only.

[4] In cases where multiple law enforcement agencies were involved in an ARD, the first agency listed in the Fatal Encounters database was used to match to an agency in the LEMAS survey.

the LEMAS.[5] Therefore, the analyses include agencies that were in the LEMAS sample and their corresponding count of ARDs (both total ARDs and OISs only). In effect, the count of ARDs from Fatal Encounters were treated as additional survey items on the LEMAS questionnaire, with only ARDs associated with agencies in the LEMAS sample examined in the cross-sectional and longitudinal analyses.

Through the cross-sectional analyses, RTI examined how various agency-level characteristics are associated with ARDs and OISs. Because key variables of interest were measured similarly across the LEMAS 2013 and 2016 waves, RTI used these two waves in the cross-sectional analyses.[6] Specifically, RTI examined measures relating to the demographic makeup of the agency; whether the agency used certain technology, including body-worn cameras and a website for complaints; and the restrictiveness of certain agency policies relating to different use of force measures. As demonstrated in the environmental scan of the literature, previous research has associated these characteristics with ARDs in various ways. To examine these associations while considering potentially confounding aspects of the community, RTI matched violent crime data from the Federal Bureau of Investigation's (FBI's) Uniform Crime Reporting (UCR) program and community demographic information from the 2016 American Community Survey (ACS) to the law enforcement agency jurisdiction for these cross-sectional analyses.

Through the longitudinal analysis, RTI focused on how changes in agency characteristics may have contributed to changes in ARDs (total and OISs) over three time points (2013, 2016, and 2020). The agency characteristics examined include those identified by previous research as potentially important correlates of ARDs, including agency demographic makeup, education requirements for officers, and body-worn camera use.[7] All agency characteristics came from the 2013, 2016, and 2020 waves of the LEMAS survey, which RTI matched to Fatal Encounters data using the agency involved in the incident and year, as described previously.[8]

[5] The LEMAS sample includes large agencies (greater than 100 full-time equivalent sworn personnel) with certainty and a sample of smaller agencies. To make the LEMAS nationally representative, survey weights are provided in the data that may be applied in statistical analyses. For the cross-sectional analyses using the LEMAS 2013 and 2016 data, the weights from each survey were summed and divided by two, consistent with typical approaches to analyzing survey data across multiple time points (e.g., Center for Behavioral Health Statistics and Quality, 2021, p. i-39). Because the longitudinal analysis of 2013, 2016, and 2020 data were conducted on the large agencies only, no survey weights were applied to this analysis.

[6] The 2013 and 2016 files were appended together before merging with the counts of ARDs from the Fatal Encounters database.

[7] Although changes in agency policies relating to use of force measures would have been relevant to include in the longitudinal analyses, these variables were not measured consistently across all three waves of the LEMAS. Hence, the association of agency use of force policies and ARDs were only examined in the cross-sectional analyses using the 2013 and 2016 LEMAS survey data, which both measured these variables consistently.

[8] Control variables for the violent crime rate and demographic characteristics of the agency jurisdiction used in the cross-sectional multivariable analyses were not included in the longitudinal analyses of ARDs across 2013, 2016, and 2020. The statistical modeling approach used in the longitudinal analyses controlled for all between-agency differences, such as the violent crime rate, demographic makeup, and other unobserved characteristics of the jurisdiction. Therefore, these control variables were not necessary to include in these analyses.

Analytical Approach

For both the cross-sectional and longitudinal analyses, the outcome of interest was counts of ARDs (both total and OISs only). Therefore, RTI used statistical models for count outcomes to examine how key agency characteristics were associated with counts of ARDs during the same period and how changes in agency characteristics were associated with changes in ARDs over the three time points. As the cross-sectional analyses analyzed the 2013 and 2016 LEMAS sample of law enforcement agencies, RTI ran survey-appropriate statistical models for count outcomes.[9] The longitudinal analyses focused explicitly on agencies that were in the 2013, 2016, and 2020 LEMAS with certainty; that is, the analyses focused on large agencies only.[10] This analysis used a statistical approach that allowed for an exploration of within-agency change in ARDs over time.[11]

Presentation of Findings

RTI performed descriptive, cross-sectional, and longitudinal statistical analyses. The following shows the number, mortality rate (e.g., per 100,000 individuals), and percentage change of deaths by selected characteristics. The number of deaths describes the size of the problem, relative differences between groups, and trends over time. The mortality rate accounts for the size of the population and captures differences between groups and change over time. Multivariable analytical models examine relationships between agency characteristics focusing on potential risk factors and practices associated with deaths.

Some results from the secondary analysis describe both the overall and relative *volume* of ARDs across different categories or groups and the overall and relative *rates* of ARDs across different categories or groups. Readers should use caution to note whether a discussion focuses on the volume versus the rate of ARDs and in making comparisons across figures. Additionally, findings from both descriptive analyses and statistical models are presented. Although the sections should be clearly marked, readers should again use caution to note whether a discussion focuses on general patterns observed through the descriptive analysis of the data or on statistical associations resulting from formal tests.

Environmental Scan of the Literature on ARDs

Concurrent to the secondary analysis of ARDs, RTI conducted an environmental scan of the literature on ARDs. The environmental scan included research articles, reports, literature reviews, and webpages from academic journals, local law enforcement agencies, and

[9] Quasi-Poisson regression models using survey weights were run for these analyses. As mentioned previously, the survey weights for 2013 and 2016 were added and divided by two.
[10] Each year of the LEMAS used in this report did not have the same large agencies for all three time points. Only agencies that were present in the LEMAS survey sample for all three time points were included in the analysis.
[11] Fixed-effects Poisson regression models with robust standard errors were conducted for the longitudinal analyses. These analyses control for all between-agency differences, which allows for the isolation of the relationship between key characteristics of interest (i.e., agency demographics, education requirements) and the outcome(s) of interest (ARDs and OISs specifically).

professional organizations. Relevant materials were identified through two approaches. First, RTI used keyword searches through electronic library databases to identify a wide range of related articles (e.g., "BJS in-custody deaths") published within the past 10 years; second, organizations' websites were searched directly (e.g., searching "in-custody deaths"). RTI also conducted a limited scan of law enforcement websites to identify relevant reports, policies, and procedures. Ultimately, the literature review focused on several primary sources, including federal agencies responsible for collecting data related to deaths in custody such as the Bureau of Justice Statistics (BJS) and the Bureau of Justice Assistance (BJA); professional organizations that represent or interact in the law enforcement sector, such as the National Sheriff's Association, International Association of Chiefs of Police, Major City Chiefs (MCCA), Police Executive Research Forum (PERF), or National Policing Institute (NPI); federal and state legislation pertaining to reporting deaths in custody; and academic and scholarly reports. Referencing these sources, the goal of the environmental scan was to highlight relevant policies and practices that have been associated with ARDs.

Overview of Law Enforcement ARDs – State of the Problem

As noted in the Introduction, there were an estimated 17,500[12] state and local law enforcement agencies in the United States as of 2018 (Gardner & Scott, 2022). These agencies vary in their organizational structures, size, and responsibilities and include sheriff's offices, local police departments, state law enforcement agencies, tribal agencies, and constables or marshals (Gardner & Scott, 2022). Local law enforcement agencies account for an estimated 67% (11,824 agencies) of all law enforcement agencies with, sheriff's offices accounting for an estimated 17% (3,051). Law enforcement agencies also include special jurisdiction agencies such as natural resources (e.g., fish and wildlife, parks and recreational), transportation systems (e.g., airports, harbors, subways), public buildings/facilities (e.g., universities/colleges, public school districts, state government buildings), and criminal investigative and special enforcement units (e.g., state bureaus of investigations, alcohol/tobacco laws).

Law enforcement agencies and their sworn personnel are charged with providing the community they serve with a safe environment. Communities can, and often do, fall under the jurisdiction of multiple agencies with some shared and different functions. For example, in many communities, the county sheriff is primarily responsible for overseeing the county jail. Within that same county, there may be multiple police departments serving various cities and towns. Furthermore, the subway or mass transit system, public school system, and universities within that county may also have their own police force. Across all of these agencies, state police and federal agencies may also have an active presence.

Just as the number and types of agencies vary within communities, the populations served can vary as well. Communities and jurisdictions can have varying demographics within their core residential population (e.g., socioeconomic status, housing, healthcare access), which may

[12] This estimate includes agencies with at least one full-time sworn personnel.

impact the likelihood of its residents coming into contact with law enforcement in the first place. For instance, certain populations such as those who are unhoused or who experience substance use disorder have been shown to be more likely to come into contact with law enforcement (Hartmann McNamara et al., 2013; Sutherland & Shepherd, 2001). Communities can also have varied levels of serious crime, including firearm violence, which in turn impacts the level of police presence in those communities (Hemenway et al., 2019; Nagin, 2020). Heightened police presence in a community ultimately increases the likelihood of individuals within those communities coming to the attention of, and engaging with, law enforcement personnel (Li et al., 2012). Understanding how to reduce ARDs may be different than deaths occurring within jail or prison facilities because the community is not a closed or regulated system. Rather, interactions between law enforcement and the communities they serve take place in an open environment, with a higher potential for law enforcement personnel to come into contact with individuals who may be armed or for other situational dynamics that make the interaction potentially more dangerous.

The Prevalence of ARDs

Given the size, functions, and responsibilities of policing, contact with law enforcement officers is common. In 2020, approximately 53.8 million persons residing in the United States reported experiencing contact with police during the previous year—or about 21% of the U.S. population 16 or older according to the Police-Public Contact Survey (Tapp & Davis, 2022). An estimated 30 million were resident-initiated calls to report a possible crime or for non-emergency assistance. Another estimated 25.5 million were law enforcement–initiated stops, such as a traffic or street stop or an arrest.[13] In some of these cases, officers may use force to detain or arrest individuals. Of the persons reporting some type of contact with the police, an estimated 2% (1,046,000 persons) stated they experienced the threat of force or non-fatal use of force during the contact. The threat or use of force was experienced more for men (3%) than women (1%), Black

Federal Law Enforcement ARDs

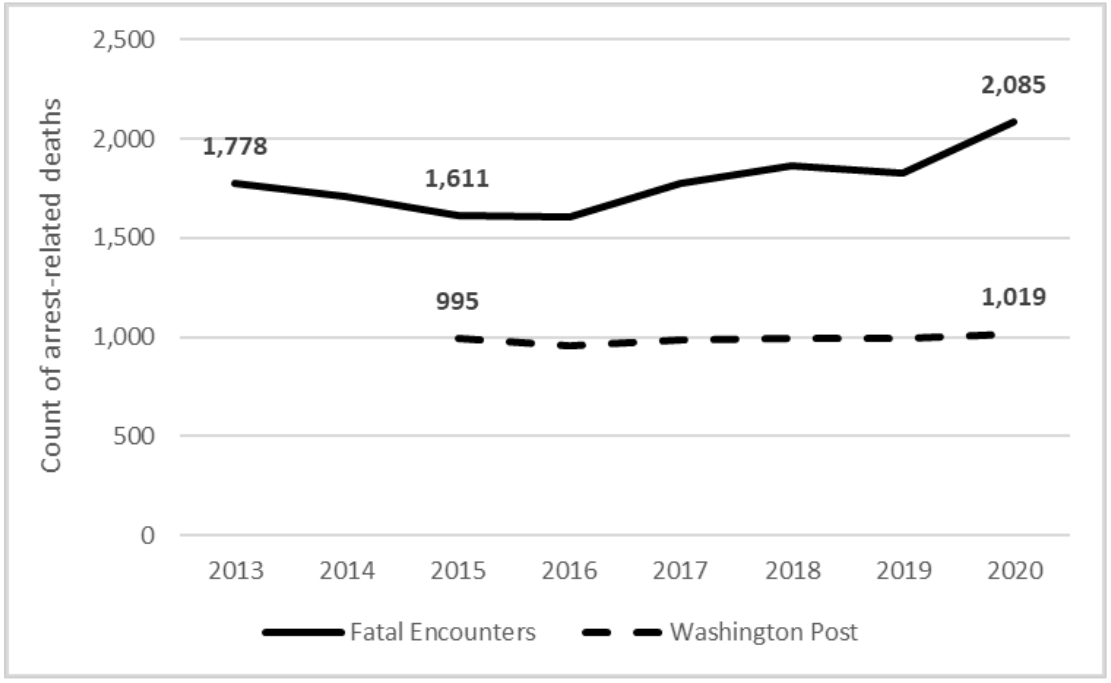
The focus of this report is primarily on ARDs attributed to state and local law enforcement agencies, which account for most ARDs that occur each year. However, it is important to note that federal law enforcement agencies account for ARDs each year. From 2016 to 2019, federal agencies reported an average of 53 ARDs (Brooks & Goodison, 2022). In 2020, the most recent year, federal law enforcement agencies reported 65 ARDs, the highest number since 2016. Deaths attributable to use of force accounted for 47% of the 65 ARDs, followed by suicide (14 deaths). In 60% of ARDs in 2020, law enforcement was serving a warrant when they made initial contact with the decedent. More information on federal law enforcement ARDs can be found in the BJS report *Federal Deaths in Custody and During Arrest, 2020 – Statistical Tables, July 2022* (NCJ 304939).

[13] Residents could report more than one type of stop; therefore, the total number of residents who reported experiencing a law enforcement–initiated stop and resident-initiated call for service exceeds the total number of persons reporting a police contact.

persons (4%) than Hispanic persons (2%) and White persons (1.5%), and those aged 18 to 24 (3%) than older persons (1%). In this report, RTI does not make any assertations about whether the use of force or the level of force used was appropriate or excessive. That determination can only be made with proper case investigation and through court proceedings. In a small fraction of cases, police contact leads to a fatality, as will be described more fully below.

This report and the DCRA Study are concerned with ARDs, or deaths occurring during an interaction with law enforcement. As noted previously, deaths were considered as within the DCRA scope "when (1) the death results from police use of force, or (2) the event causing the death (e.g., self-inflicted injury, cardiac arrest, fall from a height, drowning, drug overdose) occurs while the decedent's freedom to leave is restricted by a law enforcement agency" (Banks et al., 2016, p. 2). According to data collected through Fatal Encounters, the yearly prevalence of ARDs has increased between 2013 and 2020, with 1,778 deaths occurring in 2013 and nearly 2,100 deaths occurring by year-end 2020 (Figure 1). This reflects a 17% increase over the 8-year period, with an average of 1,782 deaths per year. Focusing explicitly on OIS fatalities reveals a slight increase between 2015 and 2020 according to data collected by *The Washington Post*. When comparing the change in ARDs writ large (as estimated by Fatal Encounters) with the change in OIS deaths (as estimated by *The Washington Post*), ARDs in general increased at a faster rate (29%) between 2015 and 2020 than shootings specifically (2.4%). However, these trends are not reflected equally for all demographic groups.

Figure 1. *Number of ARDs, 2013–2020*

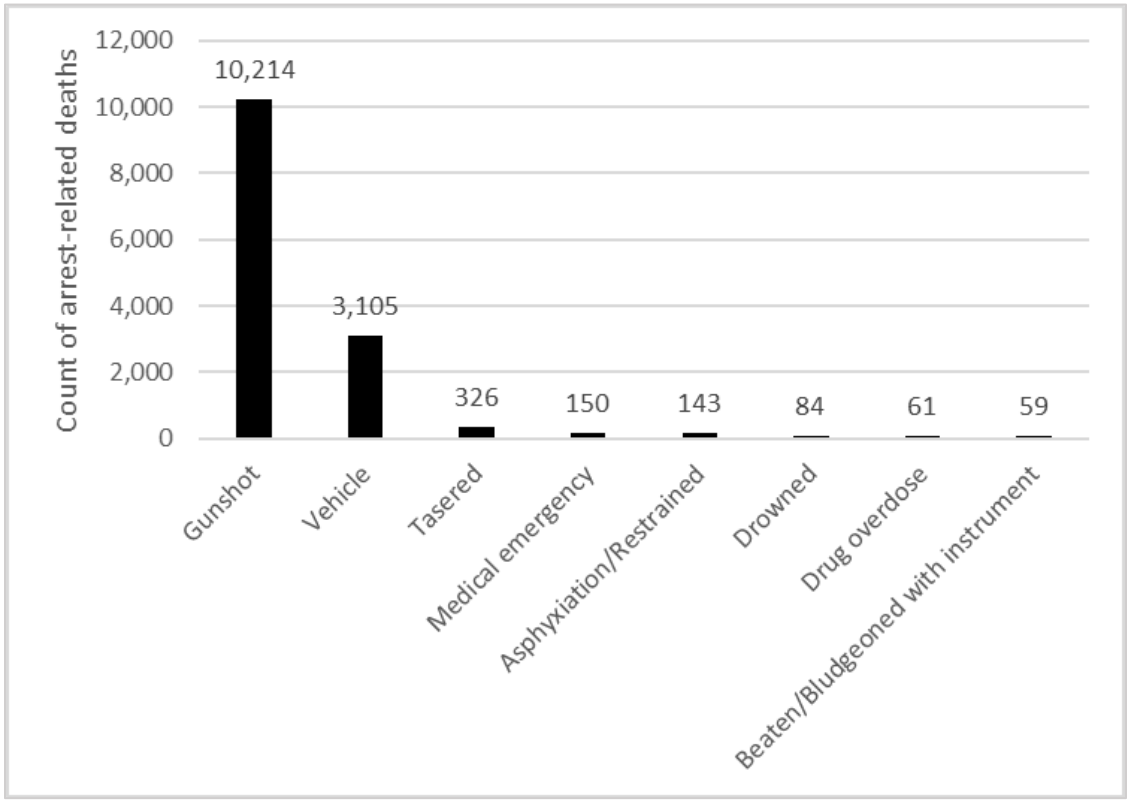


Sources: Fatal Encounters, 2013–2020; *The Washington Post* Police Shootings Database, 2015–2020.

How do People Die? Cause of Death

Between 2013 and 2020, arrest-related decedents died overwhelmingly from being shot by a firearm (Figure 2). The "gunshot" category in Figure 2 reflects individuals who were shot by law enforcement or someone else, including themselves, during an interaction with law enforcement. Deaths resulting from a gunshot account for 72% of total ARDs occurring between 2013 to 2020, or an average of more than 1,200 deaths per year. Deaths involving a vehicle, those resulting from vehicular crashes or incidents where a decedent is struck by a police cruiser while not in pursuit, accounted for 22% of ARDs during this period. Collectively, deaths via gunshot and vehicles account for the majority of ARDs between 2013 and 2020. Less-than-lethal weapons, such as conducted energy weapons (commonly referred to by the prevalent AXON company product name TASER) accounted for the next most frequent means through which individuals died, with 326 deaths spanning the 8-year period.

Figure 2. *Most frequent cause of death, 2013–2020*



Note. Other less frequent causes of death based on the highest levels of force coded in the Fatal Encounters data (but not shown here) include falling from a height, burned/smoke inhalation, stabbed, chemical agent/pepper spray, undetermined, and other. Other levels of force totaled 116 incidents between 2013 and 2020.
Source: Fatal Encounters, 2013–2020.

Who Dies While in Police Custody?

The demographic characteristics of decedents involved in ARDs were examined as well. In this section, the trends of ARDs between 2013 and 2020 and cause of death were broken down by age group, race and ethnicity, and sex. Both the absolute volume of ARDs and rates per 100,000 population are shown in the figures in this section.[14] A key limitation of using the general population to create the rates shown here is that the general population is not uniformly at risk for interacting with law enforcement. Thus, the risk of being killed during an interaction with law enforcement is also not uniform across the population (Nix, 2020). Indeed, some research has attempted to address this limitation by using other denominators, such as the arrest rate, violent crime rate, or risk of contact with police to reflect the rate of ARDs more precisely among certain population groups. However, national police–public contact information is not collected every year, lacks geographic precision to be able to link to specific agencies, and does not include unhoused persons who may have frequent contacts with the police. Determining the most appropriate and feasible denominator for ARDs is a subject of ongoing scholarship (Nix, 2020). Although this report uses the general population as the denominator for calculating rates, readers should be aware of the limitation this poses to how rates are interpreted.

In most cases, examining the rates of ARDs presents a different story than examining the relative volume of deaths experienced by different groups alone. However, understanding the absolute volume of deaths for different demographic populations is also vital to demonstrating the overall prevalence and burden of ARDs as experienced by different groups. For these reasons, both the total volume and the rate per population of ARDs are presented in the figures below.

Age

Figures 3 and 4 examine the trends in ARDs between 2013 and 2020 for different age groups. The age groups examined include children ages 0 through 9; children ages 10 through 14; teenaged youth 15 through 19; young adults aged 20 through 24; individuals ages 25 through 34; adults ages 35 through 64; and adults 65 years or older. It should be noted that the range of the age groups shown vary (e.g., 10 through 14 years old versus 25 through 34 years old); however, these age groups were examined separately because they represent substantive groups of individuals, such as young children, young adults, and older adults. Partly because of the differences in age bands shown, the population size for each also differs.[15]

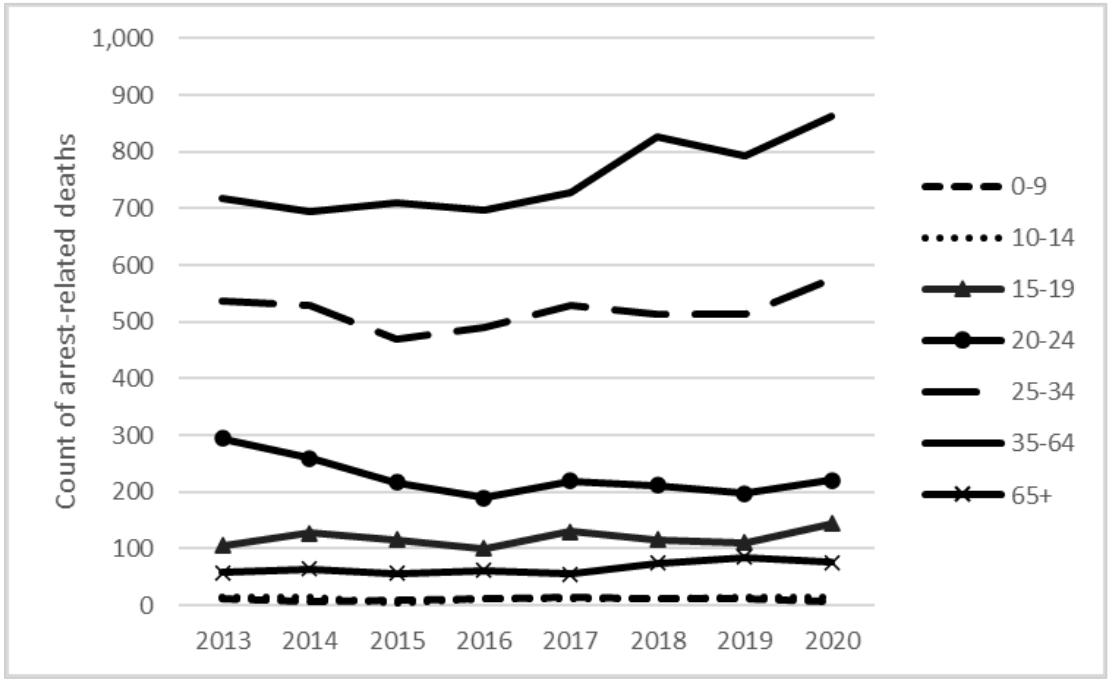
The prevalence of ARDs over time differs across age groups, as individuals between 35 and 64 years old—and to a lesser degree individuals who are 25 to 34 years old—appear to be driving the overall trend in ARDs between 2013 and 2020 (Figure 3). These two age groups together

[14] The population size per year for different age groups, race and ethnicity groups, and sexes were obtained via the U.S. Centers of Disease Control and Prevention's (CDC's) Bridged-Race population (U.S. HHS et al., 2023).
[15] Although the varying width of age bands may partially impact the absolute volume of ARDs in each group, the ARD rates shown consider population size.

account for more than 70% of the total ARDs occurring during this period. As Figure 3 shows the total *volume* of ARDs among the different age groups, this 70% share is not surprising because individuals 25 to 64 years old effectively account for the majority of the adult population. However, younger people between the ages of 20 to 24 also account for a fairly high share of decedents. Very young individuals (younger than 14 years old) and older individuals (older than 65) are least often the subjects of an ARD.

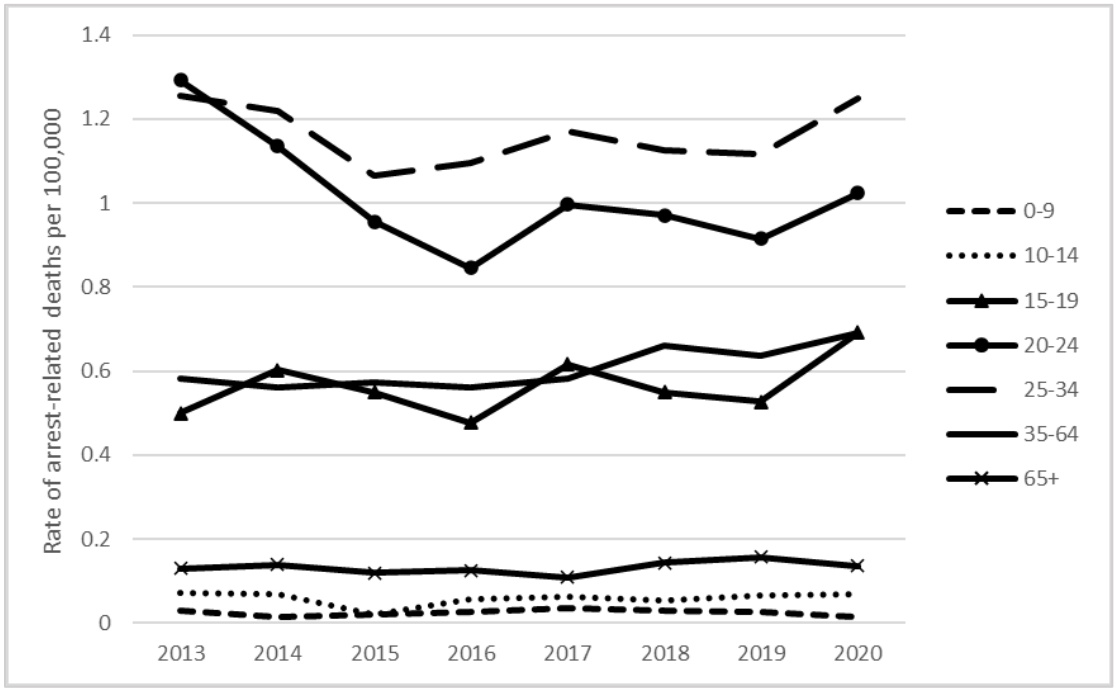
Figure 4 displays the rate of ARDs for different age groups, adjusting for the population size. Young people, particularly between the ages of 20 to 34, experience the highest rates of ARDs. These rates have fluctuated between 2013 and 2020 (Figure 4). The trend lines for individuals in both the 20- to 24-year-old and 25- to 34-year-old groups have mostly tracked together over this period, though the rates of death among 25- to-34-year-olds have remained higher than that of 20- to-24-year-old individuals. Individuals between 15 and 19 years old also have elevated rates of ARDs that sometimes exceed that of older and middle-aged individuals between 35 and 64 years old. The rates of ARDs for youth younger than 14 years old and individuals older than 65 years old are the lowest relative to other age groups.

Figure 3. *Number of ARDs, by age group, 2013–2020*



Source: Fatal Encounters, 2013–2020.

Figure 4. *Rate per 100,000 population of ARDs, by age group, 2013–2020*

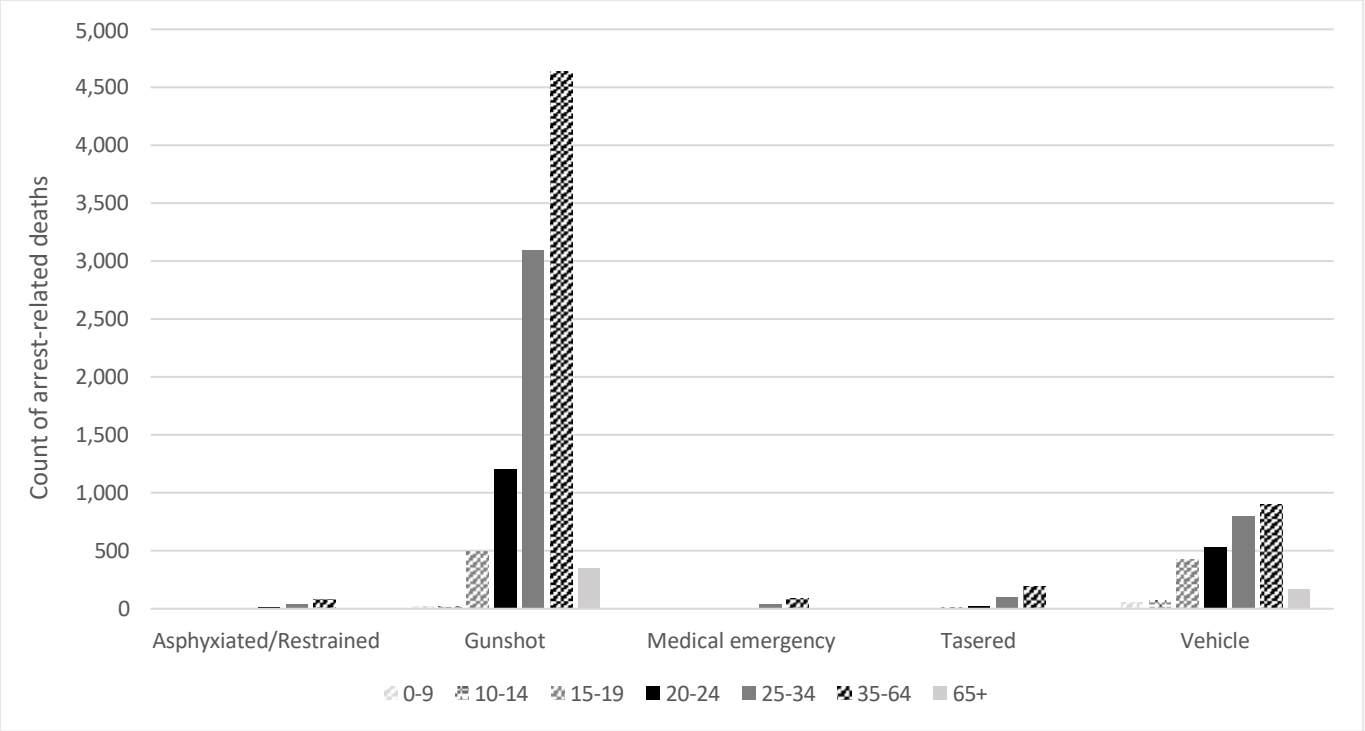


Source: Fatal Encounters, 2013–2020.

Cause of Death by Age Group

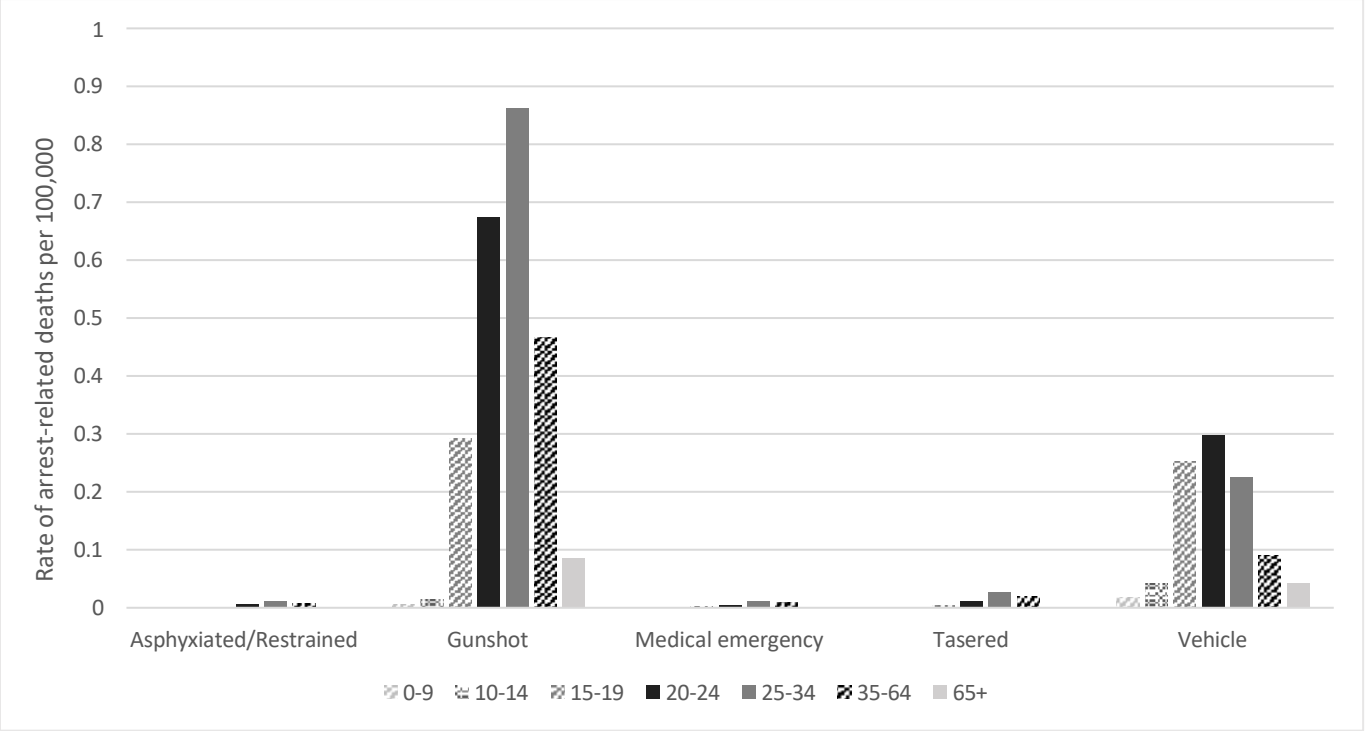
Consistent with the overall trends and the size of the age bands, 35- to 64-year-olds comprise the largest share of decedents as a result of shootings, asphyxiation, medical emergencies, TASER-related incidents, and vehicle-related incidents (Figures 5 and 6). For shootings and vehicle-related deaths in particular, 35- to 64-year-olds are most likely to be involved in an ARD followed by 25- to 34-year-olds and 18- to 24-year-olds. Individuals within the 25- to 34-year-old category experienced the highest rate of deaths for the five frequent causes of death reported with the exception of vehicle-related deaths, where young adults ages 20 to 24 years old had a higher rate of deaths (Figure 6).

Figure 5. *Most frequent cause of death, by age, 2013–2020*



Source: Fatal Encounters, 2013–2020.

Figure 6. *Rates per 100,000 population of most frequent cause of death, by age, 2013–2020*



Source: Fatal Encounters, 2013–2020.

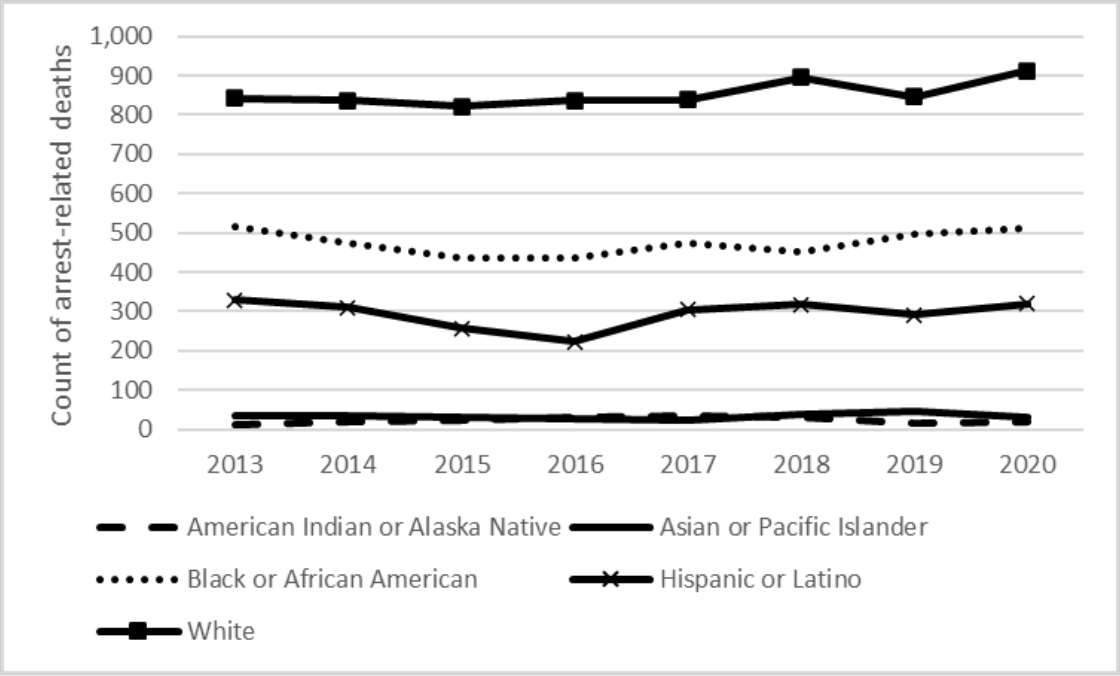
Race and Ethnicity

The prevalence of ARDs over time also differs by race and ethnicity. The bulk of ARDs occur among White, Black or African American, and Hispanic or Latino individuals, with deaths among the White population being the most prevalent because of their higher share of the population (Figure 7). The trends in deaths across these race and ethnic categories were similar, albeit with some minor fluctuations. For example, the number of deaths experienced by the Hispanic or Latino population decreased by approximately 100 deaths (a 32% reduction) between 2013 and 2016 before increasing by more than 40% in 2020. Although their population sizes vastly differ, the volume of ARDs among Black individuals was more than half that of White individuals between 2013 and 2020, on average experiencing 55% of the total number of deaths that the White population experienced. The relatively smaller share of deaths occurring among American Indian or Alaska Native and Asian or Pacific Islander individuals stayed relatively stable over the same period.

Although the total volume of deaths was concentrated among the White population (the largest in population size), Black persons experienced the highest rate of ARDs over the majority of the study period (Figure 8). In 2013, Black individuals experienced nearly 1.3 ARDs per 100,000 population, compared with the second highest group during that same time period, Hispanic or Latinos, at 0.6 deaths per 100,000 population. Of note, the rate of ARDs

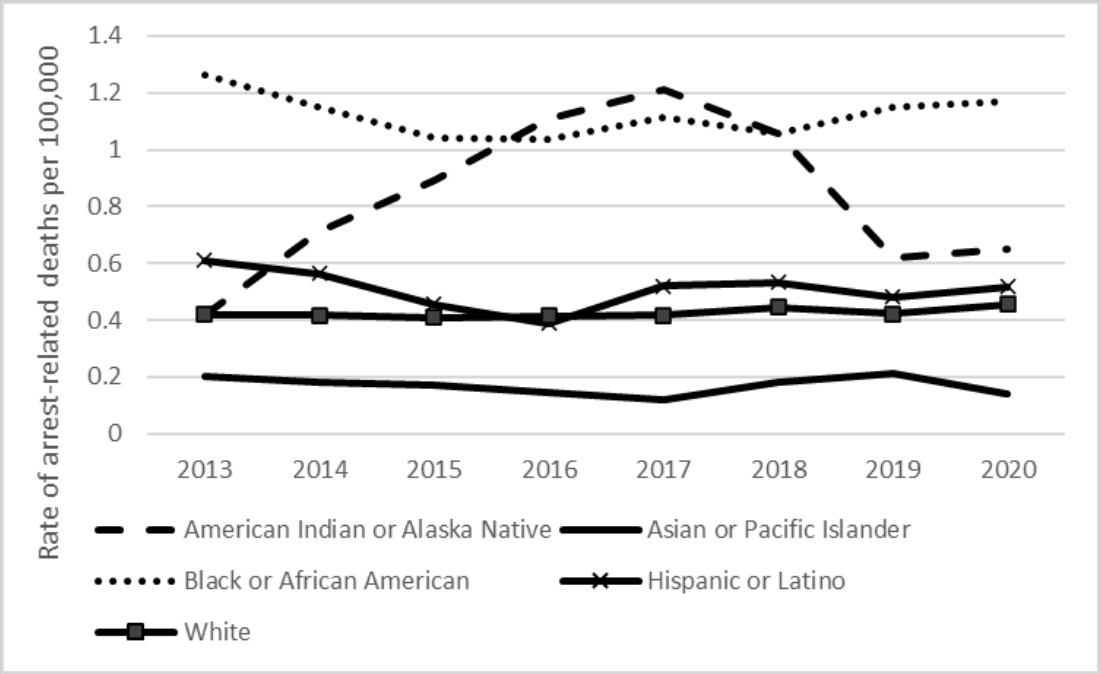
among the Black or African American group was exceeded by the rate of deaths among the American Indian and Alaska Native group during 2016 and 2017. The rate of ARDs among this latter group has fluctuated over time, experiencing a dramatic increase between 2013 and 2017, followed by a steep decline. At its peak, the American Indian or Alaska Native population experienced more than 1.2 ARDs per 100,000 population, or 33 deaths, in a single year.

Figure 7. *Number of arrest–related deaths, by race and ethnicity, 2013–2020*



Source: Fatal Encounters, 2013–2020.

Figure 8. *Rate per 100,000 population of law enforcement–related deaths, by race and ethnicity, 2013–2020*



Source: Fatal Encounters, 2013–2020.

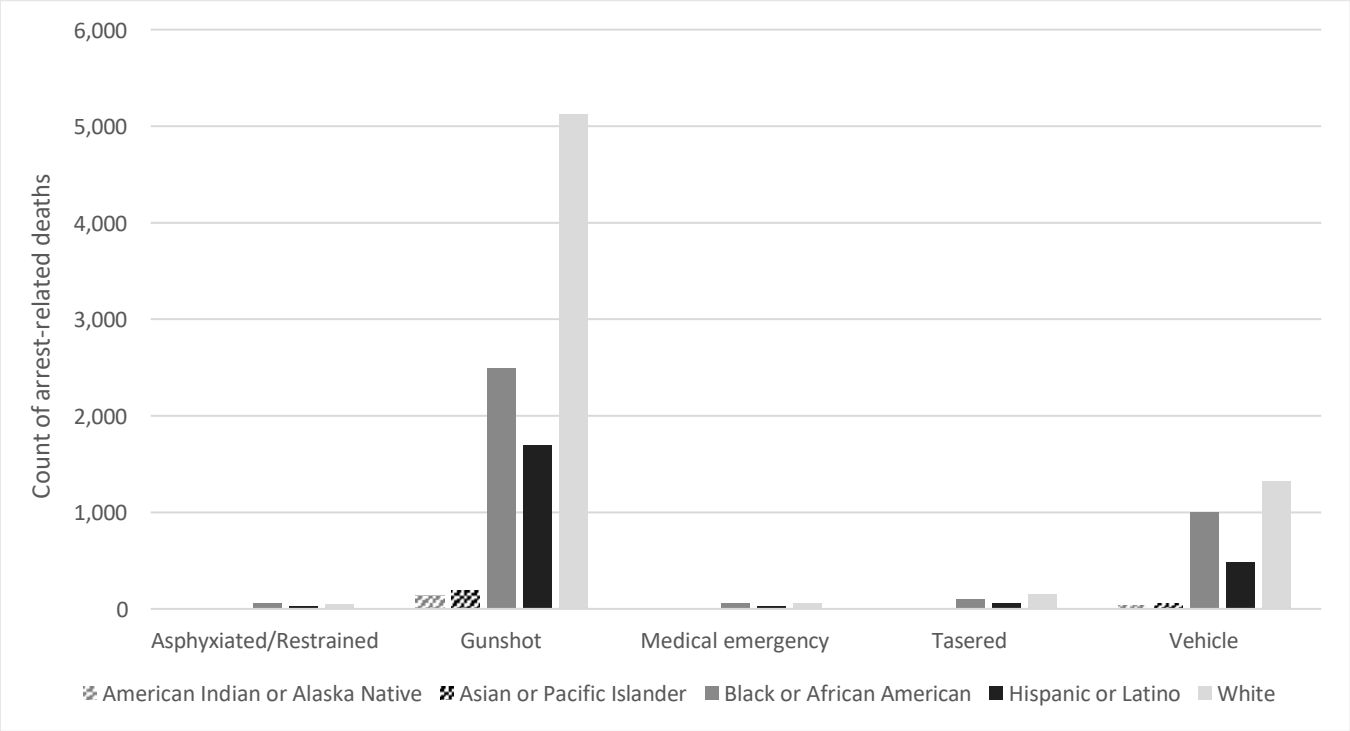
Cause of Death by Race and Ethnicity

The relative share of deaths from different causes across race and ethnic groups mimics the distribution across all deaths (Figure 9). More specifically, for every cause of death, the volume of ARDs was highest among White individuals, followed by Black or African American individuals, and then Hispanic or Latino individuals. Again, this is in part caused by the varying population sizes for each group. However, it is informative that despite these different population sizes, the total volume of Black or African American decedents who died by a gunshot was nearly half that of the total volume of White decedents.

Examining the rates of individuals in different racial and ethnic groups experiencing different causes of death, we see a familiar shift in the groups most heavily represented in these deaths (Figure 10). Notably, although White individuals comprised the largest group involved in shooting-related deaths, the *rate* of Black, American Indian or Alaska Native, and Hispanic individuals dying via gunshot outpaced the rate of White individuals who died in this manner. Between 2013 and 2020, Black individuals died from a shooting at a rate of nearly 0.75 per 100,000 followed by American Indian or Alaska Natives at a rate of roughly 0.65 per 100,000, and Hispanic or Latinos at a rate of more than 0.35 per 100,000 population. Black individuals further outpaced all other racial and ethnic groups in vehicle-involved ARDs, with American Indian or Alaska Natives following directly behind. Readers should again remember the

limitation with using the general population as the denominator to create rates of ARDs, given that the general population is not equally likely to come into contact with law enforcement.[16]

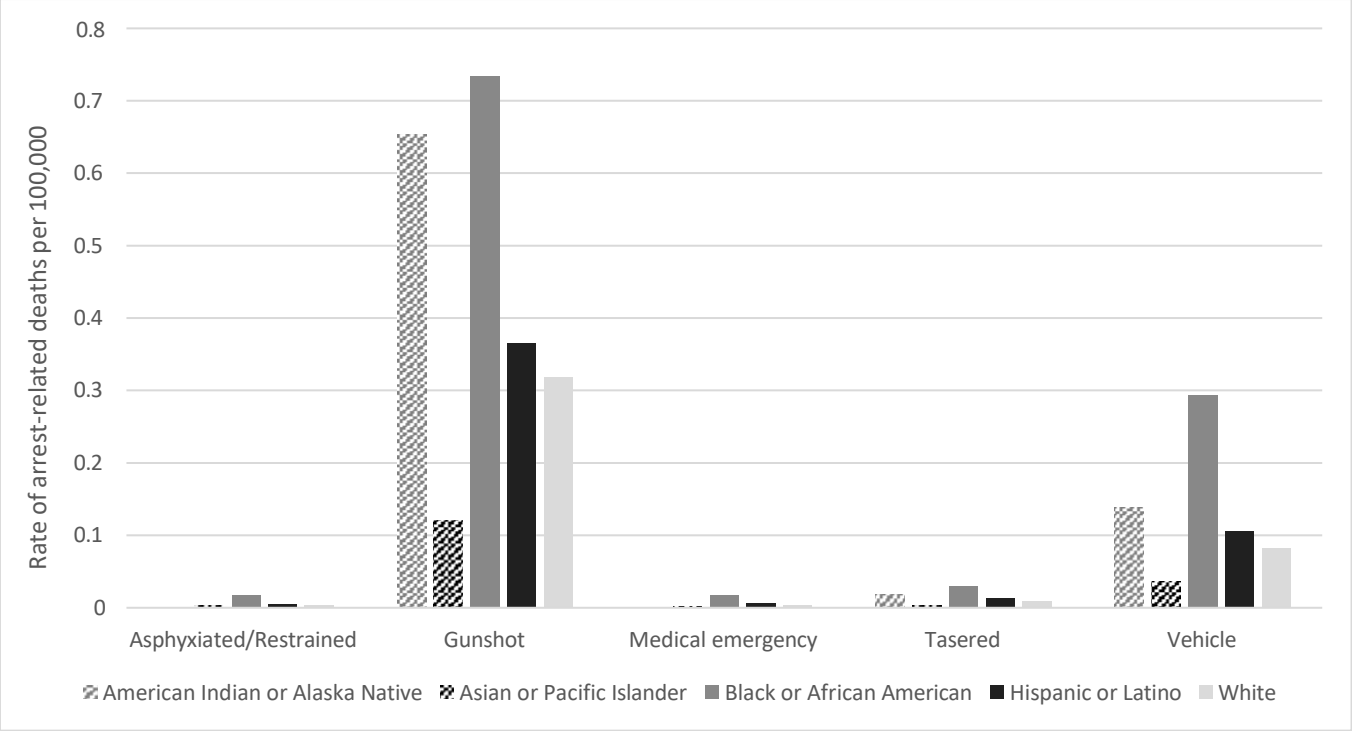
Figure 9. *Most frequent cause of death, by race and ethnicity, 2013–2020*



Source: Fatal Encounters, 2013–2020.

[16] For example, some research finds that Black individuals are more likely than other racial or ethnic groups to come in contact with police through vehicle or pedestrian stops, which may increase their risk of experiencing force relative to other groups (Gelman et al., 2007; Smith et al., 2017).

Figure 10. *Rates per 100,000 population of most frequent cause of death, by race and ethnicity, 2013–2020*

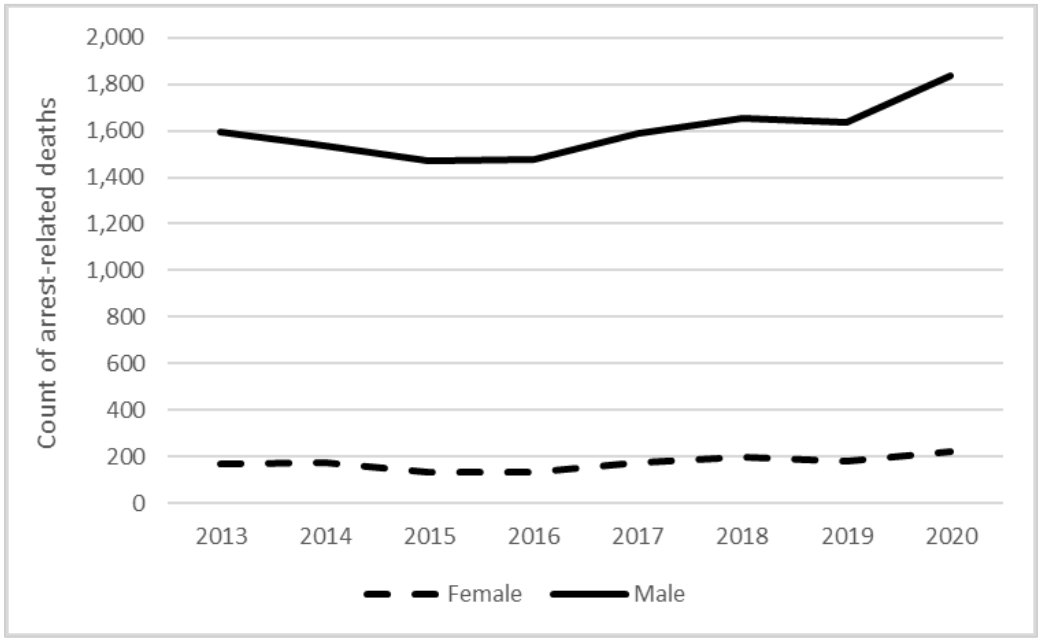


Source: Fatal Encounters, 2013–2020.

Sex

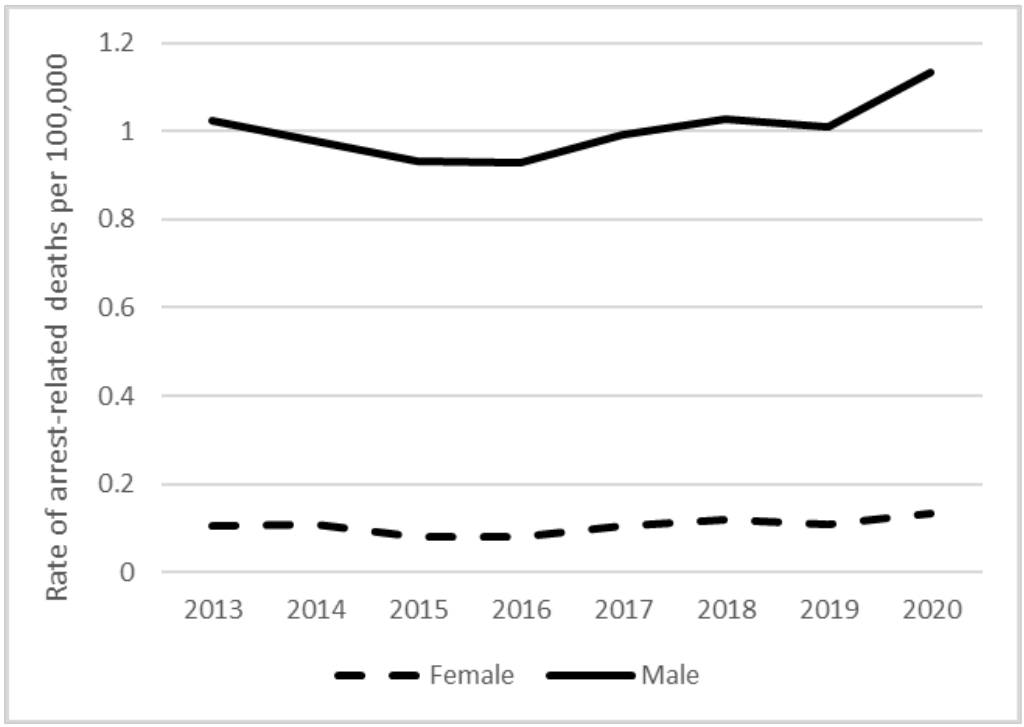
ARDs between 2013 and 2020 overwhelmingly involved men (Figures 11 and 12). This is unsurprising given that men are more likely than women to come into contact with law enforcement. Although men exceeded women in ARD involvement (in absolute volume and when accounting for their share of the population), ARDs among women have increased over time. The volume of ARDs experienced by women increased by 31% between 2013 and 2020, or from 170 deaths in 2013 to 273 deaths in 2020. For men over the same period, deaths increased by 15%, going from 1,595 deaths in 2013 to 1,837 in 2020. The rate of ARDs per 100,000 population among women also increased by 26% between 2013 and 2020, relative to an increase of 10% in the rate of ARDs for men.

Figure 11. *Number per 100,000 population of law enforcement–related deaths, by sex, 2013–2020*



Source: Fatal Encounters, 2013–2020.

Figure 12. *Rate per 100,000 population of law enforcement–related deaths, by sex, 2013–2020*

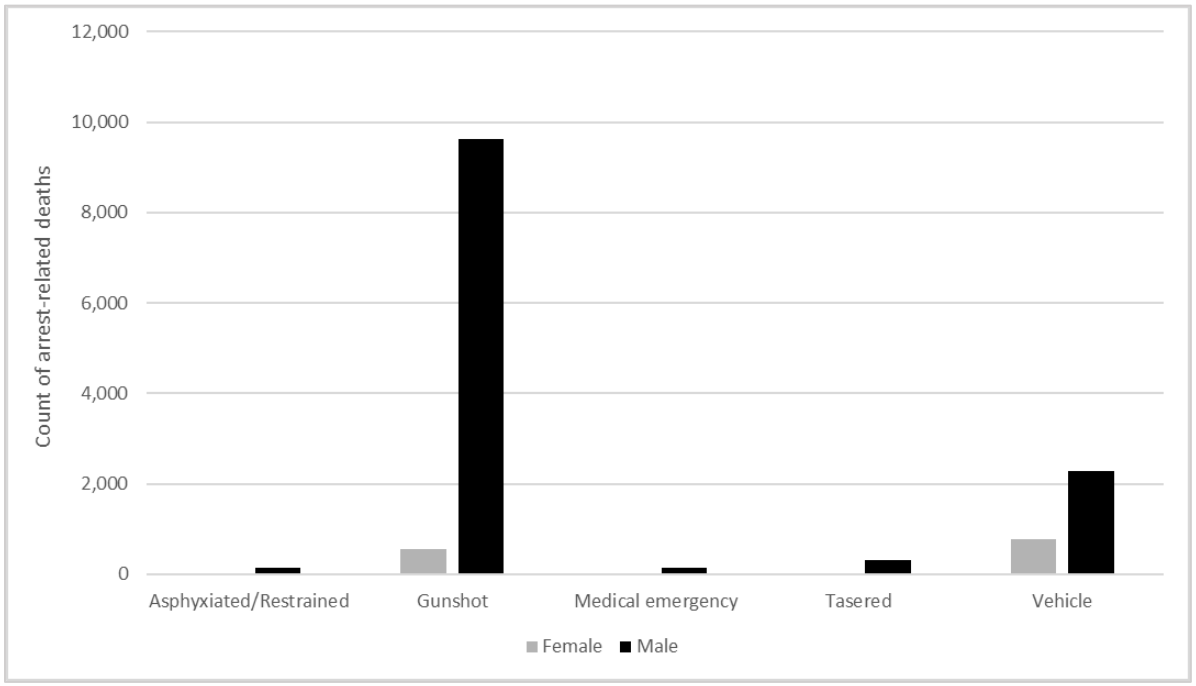


Source: Fatal Encounters, 2013–2020.

Cause of Death by Sex

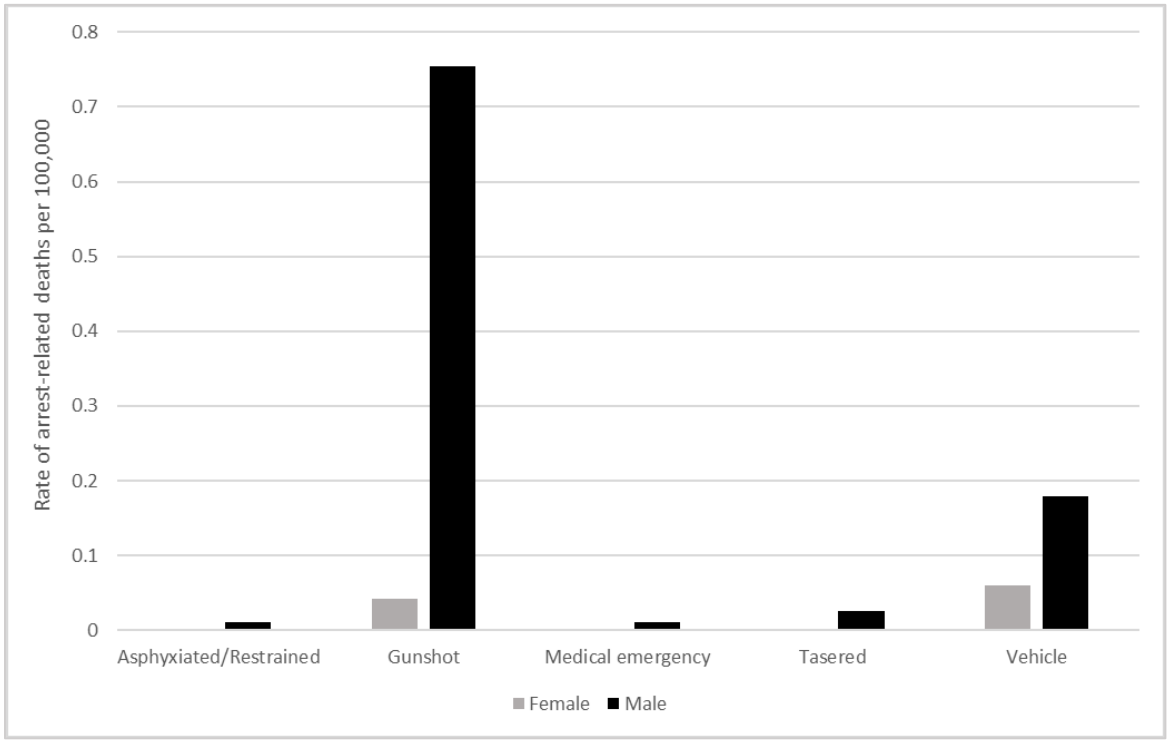
Consistent with the observed sex differences in overall ARDs, men are more frequently involved in every cause of death than women, both in absolute count and rate per population (Figures 13 and 14). Shootings comprised the most common cause of death among men dying in an ARD between 2013 and 2020 at 77% of total ARDs. For women, vehicles were the most common cause of death, representing 57% of total ARDs experienced between 2013 and 2020.

Figure 13. *Most frequent cause of death, by sex, 2013–2020*



Source: Fatal Encounters, 2013–2020.

Figure 14. *Rates per 100,000 population of most frequent cause of death, by sex, 2013–2020*



Source: Fatal Encounters, 2013–2020.

Summary of the Prevalence, Cause of Death, and Decedents Involved in ARDs

- The count of ARDs increased between 2013 and 2020, yet the trend varies across different demographic populations.
- The total *volume* of ARDs occurring between 2013 and 2020 tends to concentrate among White individuals, men, and adults between the ages of 25 and 64.[17]
- The groups experiencing the highest *rates* of ARDs during this period are Black or African American individuals, men, and young adults aged 20 to 34. Additional analyses conducted by RTI (not shown) reveal that among Black men, decedents aged 25 to 34 and 35 to 64 had the highest shares in roughly equal proportion whereas among White men, decedents were mostly older (35 to 64).
- Young people aged 15 to 19 years old, as well as Native Americans and Alaska Natives, also experienced elevated rates of ARDs, although the absolute number of deaths experienced by the latter group is relatively small.
- The cause of death during an interaction with law enforcement varies across age, race and ethnicity, and sex.
- Adults aged 25 to 34 years old experienced the highest rate of ARDs for all causes of death between 2013 and 2020, except for vehicle-involved deaths, in which they were exceeded by 20- to 24-year-old young adults.
- For shooting- and vehicle-involved deaths, Black or African American individuals experienced the highest rate of ARDs between 2013 and 2020 whereas American Indian or Alaska Native individuals were next.
- Men outpaced women in ARDs, regardless of the specific cause of death.
- Rates of deaths shown in these descriptive analyses are created using the general population (by age, race and ethnicity, and sex) as the denominator, which comes with its own set of limitations. Future research could compare ARDs using different denominators to account for the differential likelihood across the population of coming into contact with law enforcement.[18]

Circumstances of ARDs

Additional information on the circumstances surrounding ARDs is contained in the Fatal Encounters data. The work begins with a look at whether the individuals who died during encounters with the police during 2013 through 2020 were fleeing from law enforcement officers. This is followed by a look at whether individuals who died displayed aggressive movement during their encounter or were armed and, if so, with what kind of weapon. Finally,

[17] The total volume of ARDs was highest among the age groups comprising 25- to-34-year-olds and 35- to-64-year olds, which together account for a much wider age span than other groups examined (e.g., 20- to-24-year olds). The total volume among these age groups is shown to illustrate the absolute number of deaths occurring in these substantively important age groups.

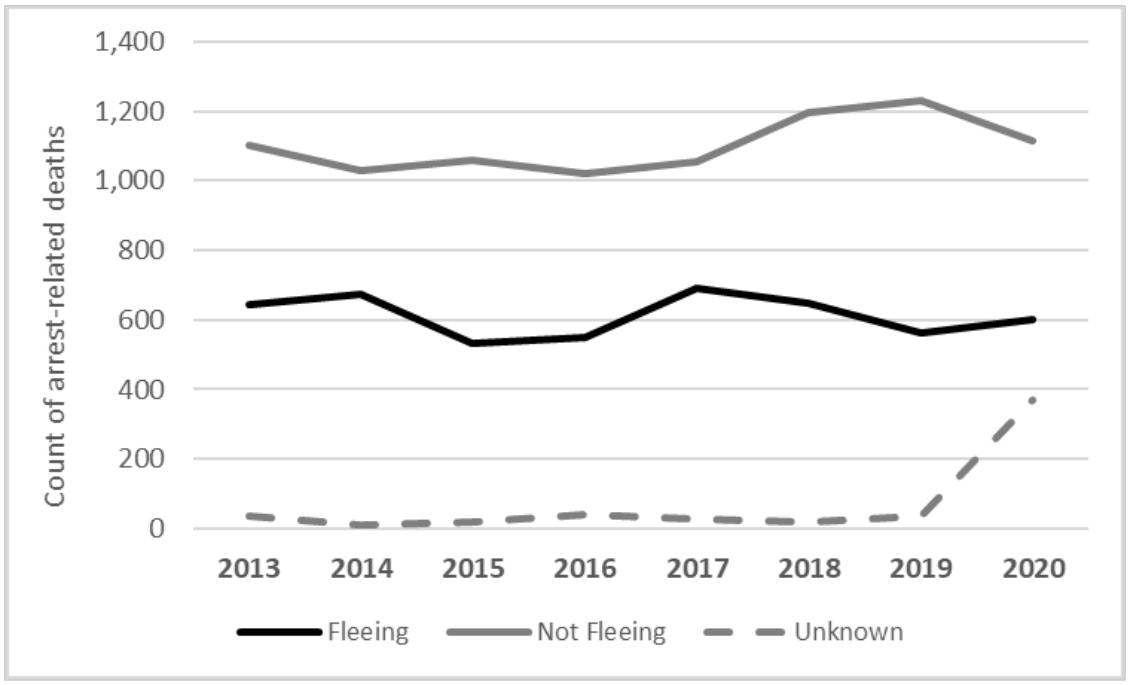
[18] As discussed previously in this section, the choice of denominator can have a significant impact on the findings. Using a denominator to accurately reflect this differential contact will allow for a more precise analysis of potential disparities in ARDs across different subgroups (Nix, 2020).

the temporal dynamics of when ARDs occur is described by examining the months and days of week during which ARDs occurred over the 2013 through 2020 time frame.

Whether Decedent Was Fleeing

During the 8-year period in question, decedents were coded as fleeing during their interaction at roughly half the rate of those coded as not fleeing (Figure 15). Both instances of decedents fleeing and not fleeing appear to have remained relatively stable over this time frame. It should be noted that from 2019 to 2020, there was a large increase (from 35 in 2019 to 371 in 2020) in the number of deaths where it was unknown whether the individual was fleeing from police when they died. Because of this issue in data quality, readers should use caution in interpreting the corresponding changes in the number of cases of decedents fleeing (or not) between 2019 and 2020. If we limit our look at the change between 2013 and 2019, the number of cases where a decedent was not fleeing during their encounter with police increased by roughly 12%. The number of cases where a decedent was fleeing had a corresponding decrease of about 13% over the same period.

Figure 15. *Whether decedent was fleeing during an ARD incident, 2013–2020*



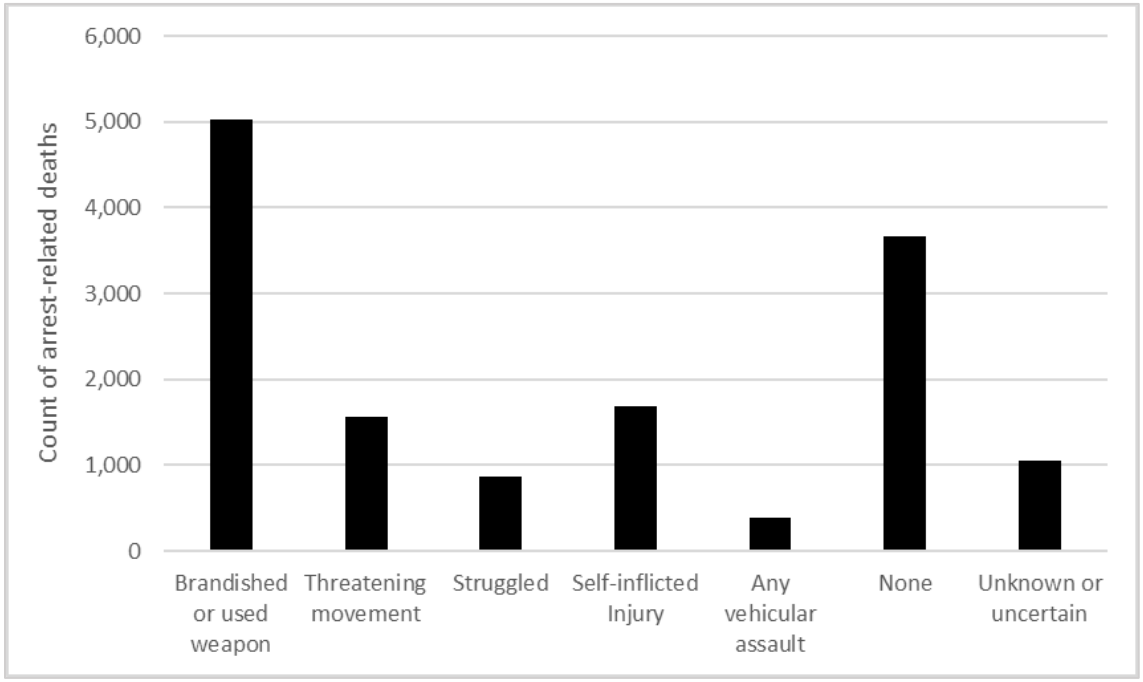
Source: Fatal Encounters, 2013–2020.

Whether Decedent Displayed Aggressive Physical Movement

In addition to whether the individual who died was fleeing during their police encounter, the Fatal Encounters database also contains a variable describing any movements that could be perceived as aggressive during the encounter (Figure 16). Focusing again on the period spanning 2013–2020, we see that a significant proportion of ARDs were those that did not

involve an aggressive physical movement (25%, or 3,671 cases). Additionally, in 7% of cases (1,044), it was uncertain whether the individual had displayed any aggressive movements during their encounter with police. This share of unknowns largely corresponded to the 2020 incident data (this year accounted for 45% of the total unknown cases). Readers should keep this limitation with the 2020 data in mind when reviewing these descriptive charts. If we limit our look at ARDs that involved an aggressive movement by the decedent, the most frequent type of aggressive movement was brandishing or using a weapon (5,026 cases, or 53%). Importantly, a large share of these ARDs involved individuals taking their own life (18%), with this circumstance outpacing aggressive movements such as those perceived as threatening (16%), struggles (9%), and vehicular assaults (4%).

Figure 16. *Type of aggressive physical movement displayed by decedent, 2013–2020*



Note: Threatening movement = sudden threatening movement, reaching to waist, advancing upon officers; Any vehicular assault = intentional vehicular assault and cases involving alleged vehicular assault.

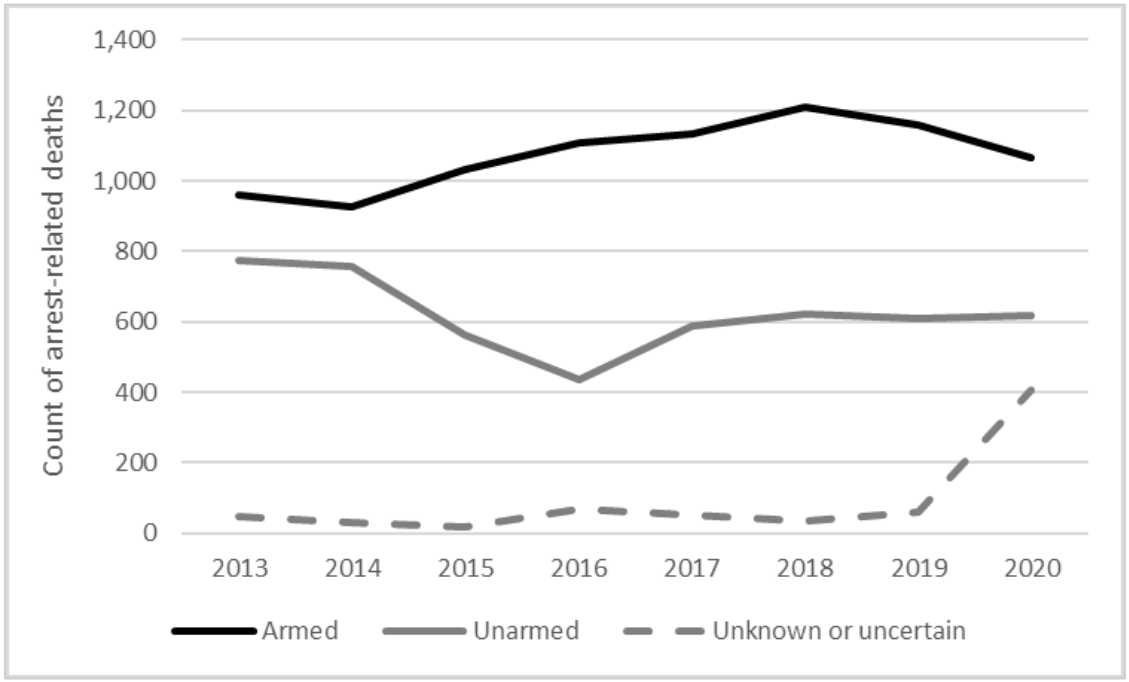
Source: Fatal Encounters, 2013–2020.

Whether Decedent Was Armed

In addition to whether the decedent displayed aggressive movements during their police encounter, we also examine whether the decedent was armed with any type of weapon during the encounter. As evident in Figure 17, where decedents' armed status was known during the period spanning 2013 through 2020, the majority of decedents were armed during their encounter with law enforcement, and this circumstance of ARDs appeared to increase over the 8-year time frame. However, as with some other variables examined thus far (i.e., aggressive physical movement, fleeing status), there was a steep increase between 2019 and 2020 in the number of cases where the armed status was unknown. Again, readers should bear in mind this

limitation in data quality of the 2020 counts[19] because it is not known what proportion of these unknown cases are in fact instances where the individual was armed or not. If we limit our look to the ARDs occurring between 2013 and 2019, we see that the cases in which individuals were armed increased 20% over this 7-year period. In 2018, the year with the highest number of armed cases, there were more than 1,200 ARDs involving an armed individual compared with 620 unarmed individuals and 36 unknown cases.

Figure 17. *Whether decedent was armed, 2013–2020*



Source: Fatal Encounters, 2013–2020.

Type of Weapon

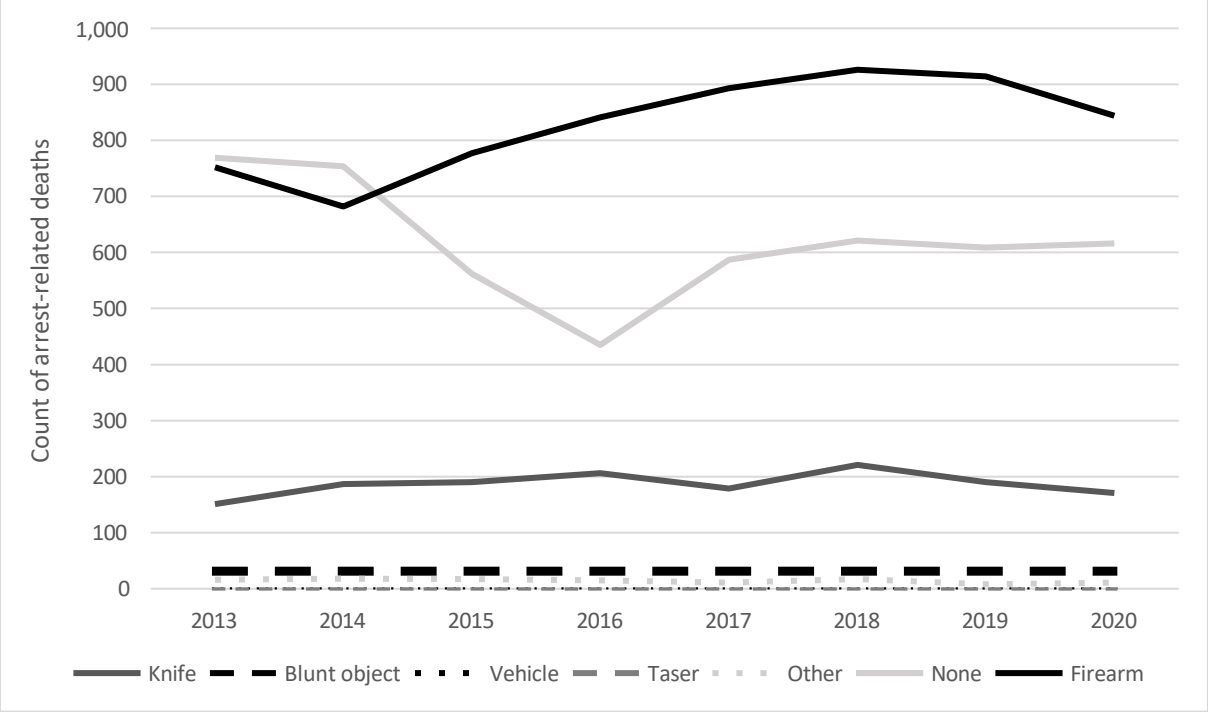
For incidents in which the decedent was armed during their encounter with police, Fatal Encounters records the type of weapon that was wielded. Between 2013 and 2020, most decedents were reported as armed with a weapon during the encounter that led to their death. Most decedents were armed with firearms, including standard firearms such as handguns, various types of long guns, and replica firearms and pellet guns, although the latter two types of firearms comprised only 5% of the total cases in which a firearm was present. Similar to other variables previously discussed, there was an increase in the number of incidents in which the weapon type was unknown between 2019 and 2020 (specifically going from 73 to 414 cases in which the weapon type was unknown or uncertain; not shown). The same limitations in data quality for this year that have been previously mentioned apply to this variable as well. If we limit our assessment to 2013 through 2019, we see that the total volume of ARDs involving a decedent armed with a firearm rose and then leveled off, ultimately increasing by 12% over the

[19] Roughly 20% (n = 405) of the 2020 ARDs were coded as "unknown" as to whether the decedent was armed.

7-year period. Over this time frame, there were 5,785 decedents armed with firearms, representing 77% of the total cases where an individual was armed with a weapon.

Although less prevalent than firearms, other weapon types have been featured in ARD incidents between 2013 and 2019. Edged weapons, such as knives, are some of the more common weapon types coded for ARDs outside of firearms. Knives were involved in an estimated 1,324 incidents between 2013 and 2019, or 18% of the total cases in which an individual was armed with a weapon. Other weapon types wielded during incidents leading to an ARD included blunt objects, which represent a wide variety of objects (e.g., crowbar, baseball bat, hammer), vehicles, TASERs, or other weapons. There were a combined 366 incidents involving these four weapon types for the period spanning 2013 through 2019, representing a small fraction (about 5%) of the incidents involving weapons during this time frame. As evident in Figure 18, a large share of incidents during this time frame were coded as involving no weapon, which is consistent with the proportion of incidents involving unarmed individuals highlighted in Figure 17.

Figure 18. *Weapon types involved*



Note: "Firearm" includes handgun, gun, rifle, shotgun, pellet gun, and replica firearm. Knife includes any kind of edged weapon. Cases with "unknown" weapon type are not shown.

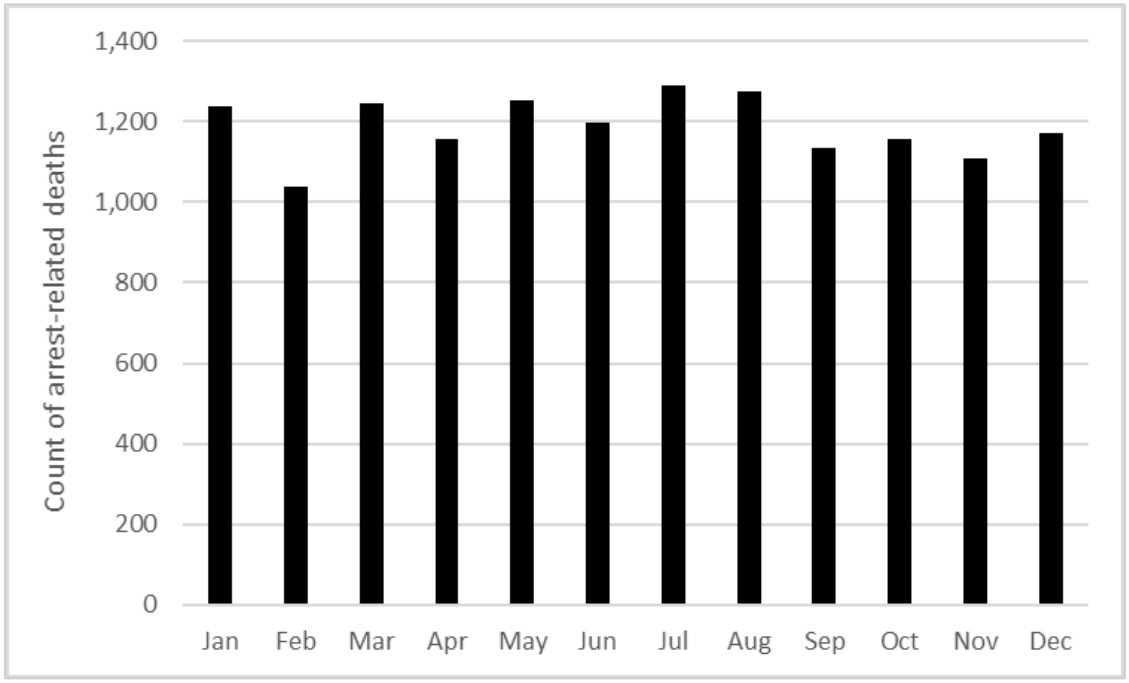
Source: Fatal Encounters, 2013–2020.

Month of Occurrence

In addition to the situational aspects related to ARD, such as whether the decedent was fleeing or armed, we also examine the temporal variability in ARDs. We look first at whether there

appear to be differences across the months in a year in the number of ARDs. Looking at Figure 19, we see there is some slight variability in the months that appear to have more ARDs relative to others, although these differences do not appear to be very large.[20] The month with the lowest number of recorded deaths is February at 1,038 deaths across the 8-year period spanning 2013 through 2020. The month with the highest number of recorded deaths was July at 1,289 deaths. Although we cannot know for certain the cause for any discrepancies across months, the elevated number of deaths occurring in July is consistent with elevated occurrences of violent assaults in general because of, for example, increased interactions between people when the weather is nice or when youth are out of school for the summer (Cohen & Felson, 1979; McDowall & Curtis, 2015; McDowall et al., 2012). However, given the comparable prevalence of ARDs in January (1,239 deaths) or May (1,252 deaths), it remains unclear from these data whether ARDs follow similar seasonality patterns as violent assaults in general.

Figure 19. *Total ARDs occurring from 2000 through 2021, by month of occurrence*



Source: Fatal Encounters, 2013–2020.

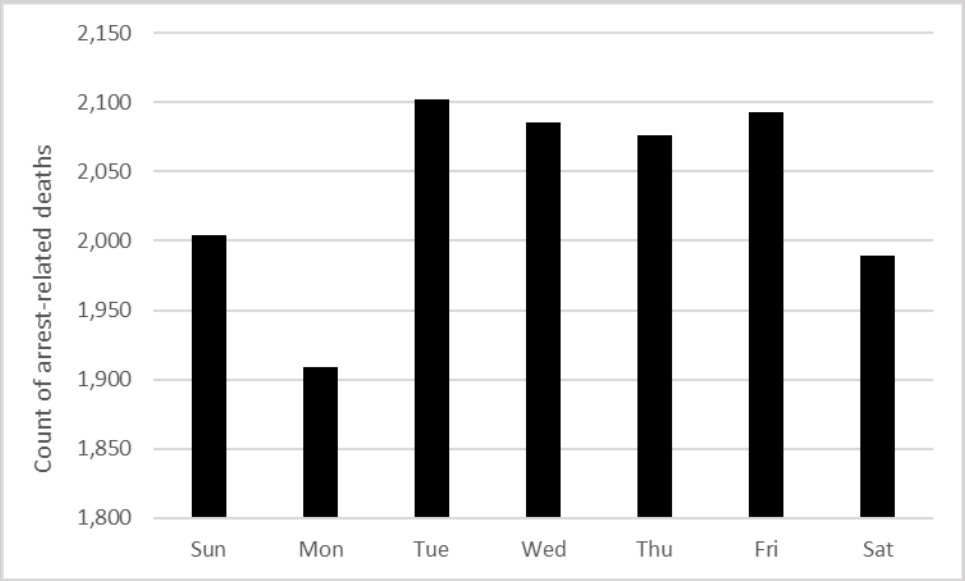
Day of Week

When examining the variation over a smaller time interval, a clearer pattern is evident (Figure 20). Deaths occurring in 2013 to 2020 tended to occur in the middle of the week from Tuesday through Friday, with Saturday through Monday having the least number of deaths. The number of deaths occurring from Tuesday through Friday is greater than the volume occurring on the weekend and on Monday. We cannot know why ARDs distribute this way across the

[20] With the exception of perhaps February versus July.

week; however, it could be caused by shifts in peoples' everyday activities, such as having to leave home during the week to go to work or school, which could increase the opportunities for interactions with law enforcement (Cohen & Felson, 1979).

Figure 20. *Total ARDs occurring from 2013 through 2020, by day of week*



Source: Fatal Encounters, 2013–2020.

Summary of the Circumstances of ARDs

- Most ARDs involved a decedent who was not fleeing.
- Most situations leading up to an ARD incident involved a person brandishing or using a weapon, with the next most frequent scenario involved the decedent exhibiting no aggressive movements during the encounter.
- Most decedents were armed during the encounter in which they died.
- Of individuals who were armed, the most common weapon was a firearm, followed by a knife or other edged weapon.
- The month and days of week during which ARDs were highest between 2013 and 2020 was in July and on Tuesdays through Fridays during the week.

Agency Characteristics

This next section describes and analyzes how ARDs may be related to various characteristics of law enforcement agencies. As described in the Methodology section, ARDs in the Fatal Encounters database were merged to the LEMAS survey waves for 2013 and 2016 to understand how different agency characteristics are linked to ARDs overall and to shooting-specific ARDs. As noted previously, the LEMAS collects nationally representative data on general purpose law enforcement agencies (e.g., sheriff's offices, local police departments, and state police departments) in the United States, including information on the number of full-

time sworn personnel; demographic makeup of the agency; policies, technology, and training used by the agency; and other organizational measures.

Because ARDs are relatively rare, RTI combined and used the two LEMAS waves (2013 and 2016) for both descriptive and inferential models to enhance our ability to detect significant associations of different agency factors on rates of ARDs. As noted previously in the Methodology section, RTI also merged additional variables such as the violent crime rate from the FBI's UCR data and demographics of the population served from the ACS to the LEMAS data. The final dataset was a pooled file representing municipal police departments and sheriff's offices in the United States during 2013 and 2016 and their associated number of ARDs during those periods.[21] The 2013 and 2016 data reflect the most recent data available from which to pull consistently measured agency-level policy measures for the descriptive and multivariable analytical models discussed in the proceeding sections. The analyses presented below therefore reflect the cross-sectional relationship between agency policies and makeup and the corresponding rate of ARDs during the combined period of 2013 and 2016.

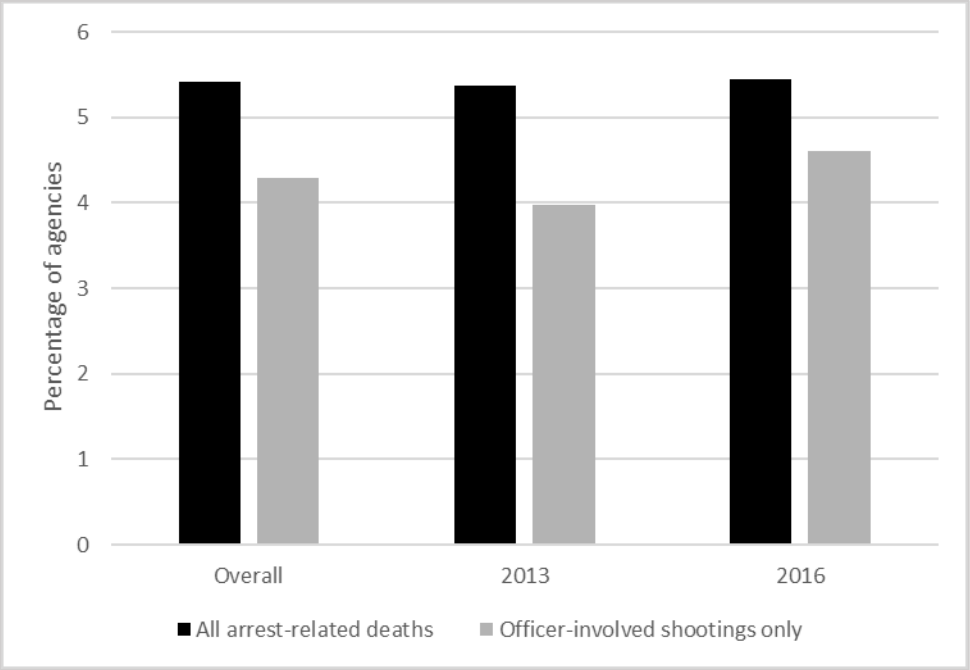
Prevalence of ARDs by Agency

Figure 21 shows the percentage of law enforcement agencies that were involved in at least one ARD in 2013, 2016, and in both years. The percentage of agencies with at least one ARD was comparable for both 2013 and 2016, with roughly 5.4% of agencies experiencing at least one death in both years. However, the percentage of agencies that had at least one OIS rose slightly from nearly 4% of agencies in 2013 to 4.6% of agencies in 2016. For agencies that experienced at least one death, the range of deaths they experienced across 2013, 2016, and 2020 varied by agency type. For instance, for local police agencies, the range of deaths experienced in all 3 years spanned from 1 to 25 deaths during those 3 years.[22]

[21] For each year, 2013 and 2016, the count of ARDs from Fatal Encounters was merged to each responsible agency on the LEMAS files, effectively treating the Fatal Encounters numbers as additional measures on the LEMAS survey. As a reminder, the LEMAS waves were appended (i.e., stacked) prior to merging with the counts of ARDs for each agency and year. Because LEMAS is a sample, it was possible that agencies could have been included in one wave of the survey but not the other. For all analyses described in this section, a survey weight was applied to make the analyses generalizable to general purpose law enforcement agencies nationally. As noted in the Methodology section, the final weight was calculated as the total of both the 2013 and 2016 weights divided by 2. Supplemental analyses on ARDs in the full Fatal Encounters data for 2013 and 2016 (not only those attached to a LEMAS agency) compared with the ARDs in the LEMAS sample only revealed that the LEMAS estimates are very close to the raw counts (the average of both years) from the full Fatal Encounters database for all agency types included in the survey. Specifically, the raw counts of ARDs are captured within 95% confidence intervals constructed around the LEMAS estimates of ARDs in 2013 and 2016.

[22] These summary statistics are based on the Fatal Encounters data and not only on agencies included in the analytic sample.

Figure 21. *Percentage of agencies with at least one ARD: 2013, 2016, and overall*



Source: Fatal Encounters, 2013 and 2016.

Rate of Deaths by Agency Characteristics

We next examine the rate of all ARDs and shootings[23] by agency characteristics for 2013 and 2016 combined. The specific agency characteristics examined include the agency's demographic makeup (i.e., what quintile does the agency fall in with regards to the demographic makeup of its personnel); whether it implements certain accountability measures (i.e., body-worn cameras and websites for civilian complaints); and the types of polices and documentation the agency implements on use of force tactics and the restrictiveness of these policies or tactics. These characteristics were examined because they have been identified in research as factors that may be associated with reduced use of force or death (Legewie & Fagan, 2016; Rabe-Hemp, 2008; Schuck & Rabe-Hemp, 2005). For instance, some research suggests higher shares of female personnel could be a protective factor against excessive uses of force, which could impact ARDs (Rabe-Hemp, 2008; Schuck & Rabe-Hemp, 2005). Additionally, some research on agency use of force policies have demonstrated that more restrictive policies are associated with a lower likelihood of ARDs (Dunham & Peterson, 2017; Terrill & Paoline, 2017). However, much of the research been conducted on these relationships has been done with one or only a few law enforcement agencies. This analysis leverages the LEMAS survey sample of agencies to examine the relative association of these potentially important agency characteristics on ARDs in 2013 and 2016.

[23]Shooting-related deaths could involve both OISs and self-inflicted shootings.

Table 1 shows that agencies do differ in their rates of both deaths depending on the type of agency, the demographic makeup of its sworn personnel, and whether the agency implements certain technologies, such as body-worn cameras and websites for citizen complaints. Importantly, it should be noted throughout that these bivariate descriptive tables do not control for potentially confounding characteristics that may affect the patterns between any single agency characteristic and the rate of ARDs in agencies.[24] Therefore, caution must be used when interpreting and using these descriptive results. Continuous variables ranging from 0% to 100%, such as percent female, are arranged into quintiles to create comparison groups. Quintiles sort the range of agencies into five even groupings from low to high (20% each). For some characteristics, such as percentage Black, many agencies do not have a Black officer so the two lower categories both have a range that is just 0%.

As can be seen in Table 1, sheriff's offices tend to have higher rates of ARDs from any manner of death and shootings than municipal police departments. When examining the demographic makeup of departments, there are noted differences in the rates of ARDs. As departments employ more female personnel, the corresponding rate of ARDs also increases. For example, departments in the bottom 20% of female personnel had a rate of 3.2 ARDs per 1,000,000 population served whereas departments in the top 20% of female personnel had a rate of 5.3 ARDs per 1,000,000 population served. Additionally, departments that employ more Black or Hispanic officers are associated with higher rates of ARDs than departments that have fewer Black or Hispanic personnel. Again, absent controls for other characteristics, these bivariate relationships may be confounded by other aspects of the agency or community served and so must be interpreted with caution. Additionally, the LEMAS data describe the agency makeup at the organizational level; however, there is no information on the demographic distribution of specific units within agencies who regularly interface with the public and who have a higher chance of being involved in an ARD.

Table 1. *Rate of ARDs by agency characteristics*

	All ARDs		Gunshot only	
Characteristic	**Rate**	**SE**	**Rate**	**SE**
Agency type				
Police department	4.48	0.33	3.39	0.26
Sheriff's office	4.82	0.54	3.51	0.43
Personnel demographics				
% Female				
1st quintile [0–0%]	3.19	0.99	1.65	0.61
2nd quintile [0–5.9%]	3.84	0.53	2.72	0.42
3rd quintile [5.9–9.9%]	4.03	0.39	3.07	0.31
4th quintile [9.9–14.5%]	4.82	0.46	3.60	0.36
5th quintile [14.5–100%]	5.33	0.72	4.16	0.57

[24] The multivariable regression model described later in this section will accomplish this.

Characteristic	All ARDs		Gunshot only	
	Rate	SE	Rate	SE
Personnel demographics (continued)				
% Black				
1st quintile [0–0%]	3.02	0.60	1.80	0.39
2nd quintile [0–0%]	2.86	0.68	2.03	0.54
3rd quintile [0–2.7%]	4.24	0.43	3.20	0.35
4th quintile [2.7–8.8%]	4.87	0.48	3.66	0.37
5th quintile [8.8–100%]	5.46	0.67	4.19	0.53
% White				
1st quintile [0–74%]	6.41	0.70	4.84	0.55
2nd quintile [74–87.7%]	4.66	0.48	3.55	0.37
3rd quintile [87.7–95.5%]	3.53	0.38	2.74	0.30
4th quintile [95.5–100%]	2.53	0.38	1.53	0.30
5th quintile [100–100%]	2.67	0.75	1.86	0.54
% Hispanic				
1st quintile [0–0%]	3.23	0.62	1.93	0.42
2nd quintile [0–0%]	3.68	0.83	2.35	0.56
3rd quintile [0–2.2%]	3.91	0.45	2.90	0.35
4th quintile [2.2–8.3%]	4.25	0.39	3.30	0.32
5th quintile [8.3–100%]	5.88	0.68	4.53	0.54
Has body-worn cameras				
Yes	5.25	0.54	3.89	0.43
No	4.22	0.31	3.15	0.24
Complaints filed through website				
Yes	4.94	0.40	3.86	0.33
No	4.03	0.36	2.91	0.28

Note. Law enforcement agency data are from the 2013 and 2016 LEMAS survey. ARDs for 2013 and 2016 are from Fatal Encounters. Rates are per 1,000,000 population served. Rates were created using 2013 and 2016 combined survey weights divided by 2. Values in brackets represent the quintile breaks (upper and lower bound) for the agency characteristics. SE = standard error.

In addition to the demographic makeup of departments, agencies that reported having certain accountability measures, such as body-worn cameras and websites to submit citizen complaints, were associated with higher rates of ARDs (overall and shooting-related) (Table 1). For instance, agencies with body-worn cameras were associated with higher ARDs than those that did not report having body-worn cameras (5.3 vs. 4.2 deaths per 1,000,000 population, respectively), with the same pattern noted for shooting ARDs. Agencies that also allowed for officer complaints to be filed through a website had higher ARDs than those that did not report such capabilities. Although these patterns are in the unexpected direction, we are unable to know whether agency adoption of these measures was due in part to higher rates of ARDs or whether agencies who tended to have more ARDs also tended to implement these sorts of accountability measures (i.e., a spurious relationship). This latter possibility is accounted for in the multivariable models discussed below.

Table 2 shows the rate of ARDs for agencies by different policy types and levels of restrictiveness of those policies. One way in which policies may be more or less restrictive is through their levels of use authorization. For instance, different policies can be authorized for

use by all personnel, some personnel, or not authorized for use by any personnel in an agency. Other policies on different actions can include requiring documentation when the action is performed (more restrictive) or not requiring any documentation if an action is performed (less restrictive). In Table 2, we see that for some specific law enforcement actions, more restrictive policies are associated with fewer ARDs, while the opposite is true for other actions. For example, the pattern for TASERs reveals that agencies that authorize more personnel to use TASERs have higher rates of ARDs than agencies that do not authorize personnel to use TASERs.

Table 2. *Rate of ARDs by agency policy and level of authorization*

	All ARDs		Gunshot only	
Policies	**Rate**	**SE**	**Rate**	**SE**
Firearm – display				
Documentation is required for use	4.24	0.32	3.12	0.23
Documentation is not required for use	5.00	0.48	3.74	0.39
Firearm – use				
Documentation is required for use	4.67	0.29	3.46	0.23
Documentation is not required for use	3.26	1.58	2.92	1.38
TASER				
Authorized for all personnel	4.76	0.31	3.51	0.24
Authorized for some personnel	4.21	0.64	3.33	0.52
Not authorized	3.43	0.72	2.57	0.57
TASER – display				
Documentation is required for use	4.65	0.34	3.41	0.25
Documentation is not required for use	4.78	0.50	3.62	0.41
TASER – use				
Documentation is required for use	4.70	0.31	3.51	0.24
Documentation is not required for use	5.42	1.92	3.32	1.33
OC spray				
Authorized for all personnel	4.62	0.30	3.46	0.23
Authorized for some personnel	3.93	0.88	3.18	0.75
Not authorized	4.24	1.29	2.14	0.79
Documentation is required for use	4.60	0.29	3.47	0.23
Documentation is not required for use	3.73	1.54	2.06	0.94
Other chemical agents				
Authorized for all personnel	5.15	0.48	3.88	0.38
Authorized for some personnel	4.65	0.38	3.73	0.32
Not authorized	3.95	0.41	2.66	0.30
Documentation is required for use	5.08	0.36	3.87	0.29
Documentation is not required for use	5.08	1.63	2.44	0.93
Baton				
Authorized for all personnel	4.83	0.31	3.58	0.25
Authorized for some personnel	3.20	0.62	2.86	0.59
Not authorized	1.86	0.50	1.38	0.44
Documentation is required for use	4.76	0.30	3.56	0.24
Documentation is not required for use	2.85	1.05	1.63	0.65
Soft projectiles (e.g., bean bags)				
Authorized for all personnel	5.04	0.46	3.89	0.38
Authorized for some personnel	4.54	0.36	3.58	0.30
Not authorized	3.68	0.47	2.22	0.31

Policies	All ARDs		Gunshot only	
	Rate	SE	Rate	SE
Leg hobble or other restraints				
Documentation is required for use	4.84	0.34	3.73	0.27
Documentation is not required for use	5.80	1.89	3.89	1.42
Closed hand technique				
Authorized for all personnel	4.63	0.30	3.45	0.24
Authorized for some personnel	2.52	1.20	1.60	1.07
Not authorized	4.31	0.78	3.32	0.63
Documentation is required for use	4.67	0.31	3.48	0.24
Documentation is not required for use	4.60	0.89	2.99	0.66
Authorized for all personnel	4.87	0.35	3.66	0.28
Authorized for some personnel	3.41	0.59	2.51	0.48
Not authorized	4.01	0.49	2.92	0.38
Documentation is required for use	4.84	0.38	3.67	0.30
Documentation is not required for use	4.60	0.53	3.32	0.42
Neck restraints				
Authorized for all personnel	5.35	0.67	4.26	0.57
Authorized for some personnel	4.27	1.08	3.44	0.93
Not authorized	4.28	0.31	3.07	0.23
Documentation is required for use	5.26	0.48	4.04	0.40
Documentation is not required for use	3.72	1.01	2.72	0.81
Takedown techniques				
Authorized for all personnel	4.65	0.29	3.47	0.23
Authorized for some personnel	3.13	1.37	2.48	1.28
Not authorized	3.20	0.83	2.24	0.71
Documentation is required for use	4.55	0.30	3.40	0.23
Documentation is not required for use	5.08	1.01	3.83	0.87
Open hand techniques				
Authorized for all personnel	4.64	0.29	3.45	0.23
Authorized for some personnel	3.55	1.64	2.61	1.54
Not authorized	2.88	0.97	2.59	0.91
Documentation is required for use	4.55	0.30	3.37	0.23
Documentation is not required for use	5.12	0.91	3.91	0.78

Note. Law enforcement agency data are from the 2013 and 2016 LEMAS survey. ARDs for 2013 and 2016 are from Fatal Encounters. Rates are per 1,000,000 population served. Rates were created using 2013 and 2016 combined survey weights divided by 2. OC = oleoresin capsicum (i.e., pepper spray); SE = standard error.

Rate of Deaths by Agency Policy Type and Restrictiveness

Multivariable Analysis Results

Tables 3 through 8 show the results from the cross-sectional multivariable model[25] examining the association of agency characteristics on total ARDs and shootings in 2013 and 2016.

[25] RTI ran Quasi-Poisson regression models to estimate the count of ARDs per 100,000 population in 2013 and 2016 as a function of various agency characteristics, controlling for aspects of the community. Quasi-Poisson regression models are an elaboration of Poisson regression models that account for over- or under-dispersion in the dependent variable. This model is appropriate for count outcomes, such as the count of ARDs. The exponentiated Quasi-Poisson model coefficients are interpreted as IRRs, which effectively turn the count outcomes into a rate. The population served by each law enforcement agency was included in the models as an offset, such that the IRRs are interpreted as the count of ARDs per 100,000 population served.

Tables 3 through 5 showcase the variables tested in agencies with their estimated count of deaths per 100,000 population. In line with the previous analyses, all models were run with the LEMAS survey weights (summed and divided by 2, because 2 years were included) and included a range of control variables measuring characteristics of the community.

Table 3 shows the associations between individual agency policies and the total ARD rate for 2013 and 2016. Each agency characteristic included in Table 3 was modeled separately, along with a series of control variables, such as the violent crime rate and the sociodemographic characteristics of the community,[26] which are not shown because of space constraints. Again, the population of the jurisdiction served was included in the model as an offset to turn the estimated count of ARDs into a rate of ARDs per 100,000 population served.

The model results revealed that several key policies, in addition to agency characteristics, significantly predicted ARDs when controlling for community context. From Table 3, agency type matters. Specifically, sheriff's offices were associated with roughly 55% more (incident rate ratios [IRRs] = 1.55) deaths per 100,000 population served than municipal police departments when controlling for all other community characteristics. Sheriff's offices differ from municipal police departments in many aspects, including that the chief law enforcement officer is an elected official. Organizationally, there may be something unique to sheriff's offices in their daily function and duties, in the policies that they employ, or in some other way that makes these agencies more likely to be involved in an ARD than a municipal police agency.

However, Table 3 indicates that there are certain policies and levels of restrictiveness that are protective when it comes to ARDs. Of the 10 policy types and authorization levels examined, half were associated with fewer ARDs but only when *not* authorized relative to authorized for all sworn personnel. For example, agencies that did not authorize baton use were associated with about 60% fewer fatalities than agencies that authorized baton use. Not authorizing certain physical tactics like leg hobbles and neck restraints was also associated with fewer ARDs (about 22% and 23% fewer deaths per 100,000 population served, respectively). Finally, agencies that did not authorize certain less-than-lethal options, including soft projectile use and TASERs, were associated with fewer deaths (27% and 33% fewer, respectively) compared to agencies who did authorize soft projectiles and TASERs. The primary takeaway from these results is that agencies that are more restrictive by not authorizing the use of many use of force techniques are associated with fewer ARDs, at least in the time frame examined here.

[26] Not shown: Control variables included the percentage of the population that was Black; American Indian or Alaska Native; Asian; Native Hawaiian or Pacific Islander; some other race; multiracial; Hispanic; aged 10–17; 18–24; 25–34; 35–54; 55–64; 65 or older; with an income/poverty threshold between: 0.5 and 1; 1 and 1.25; 1.25 and 1.5; 1.5 and 1.85; 1.85 and 2; greater than 2; and the violent crime rate. Control variables were obtained from the 2016 ACS and the FBI's UCR crime data.

Table 3. *Modeled associations with agency ARD rate: Agency type and use of force authorization*

Characteristics	Estimate	SE	t value	p	IRR	Sig.
Sheriff's office (Ref: Police)	0.440	0.139	3.155	0.002	1.552	**
Authorization (Ref: Authorized)						
Baton (Some)	−0.310	0.192	−1.615	0.106	0.733	
Baton (Not Authorized)	−0.897	0.272	−3.294	0.001	0.408	***
Leg hobble or other restraints (Some)	−0.289	0.158	−1.834	0.067	0.749	
Leg hobble or other restraints (Not Authorized)	−0.248	0.112	−2.205	0.028	0.781	*
Neck restraints (Some)	−0.191	0.254	−0.752	0.452	0.826	
Neck restraints (Not Authorized)	−0.252	0.094	−2.674	0.008	0.777	**
Soft projectiles (e.g., bean bags) (Some)	−0.063	0.083	−0.761	0.447	0.939	
Soft projectiles (e.g., bean bags) (Not Authorized)	−0.316	0.145	−2.174	0.030	0.729	*
TASER (Some)	−0.135	0.129	−1.051	0.293	0.873	
TASER (Not Authorized)	−0.402	0.187	−2.147	0.032	0.669	*
Closed hand techniques (Some)	−0.495	0.467	−1.060	0.289	0.610	
Closed hand techniques (Not Authorized)	−0.159	0.155	−1.025	0.305	0.853	
Other chemical agents (Some)	−0.064	0.087	−0.733	0.464	0.938	
Other chemical agents (Not Authorized)	−0.188	0.112	−1.676	0.094	0.828	
Open hand techniques (Some)	−0.127	0.452	−0.280	0.779	0.881	
Open hand techniques (Not Authorized)	−0.422	0.301	−1.402	0.161	0.656	
OC spray (Some)	−0.069	0.166	−0.417	0.676	0.933	
OC spray (Not Authorized)	−0.092	0.292	−0.316	0.752	0.912	
Takedown techniques (Some)	−0.265	0.416	−0.639	0.523	0.767	
Takedown techniques (Not Authorized)	−0.253	0.242	−1.048	0.295	0.776	
Vehicle pursuit policy (Ref: Bans)						
Discourages	−1.154	0.615	−1.877	0.061	0.315	
Restricts	−0.377	0.529	−0.712	0.477	0.686	
Discretion of officer	−0.363	0.543	−0.669	0.504	0.696	
No policy	−0.740	1.011	−0.732	0.464	0.477	

Note: *p < .05, **p < .01, ***p < .001. Quasi-Poisson models predicting count of total ARDs per population served in 2013 and 2016. IRR = incident rate ratio; Ref = reference category; SE = standard error; Sig = statistical significance. Models use survey weights for both the 2013 and 2016 LEMAS summed and divided by 2. Control variables measuring aspects of the community (i.e., racial and ethnic makeup; age; income/poverty threshold; violent crime rate) are included in these models but not shown. Offset = total population served.

Table 4 shows how agency documentation requirements to use different force techniques relate to ARDs and how different agency accountability measures (body-worn cameras and websites for civilian complaints) relate to these deaths, controlling for the same community characteristics noted for Table 3. The results indicate not requiring officers to document when they have used a baton or a firearm is associated with significantly fewer ARDs relative to agencies that do require such documentation (e.g., baton (No) 43% less [IRRs] = 0.570). In addition, agencies that did not have a website through which complaints could be filed were also associated with significantly fewer deaths, controlling for contextual features of the community (Website to report (No) 17% less [IRRs] = 0.826). These patterns are in an unexpected direction, as we would expect that requiring officers to document when they use certain force tactics would serve in some measure as a deterrent to use of that tactic. Similarly,

we would also expect that agencies that provide a way for community members to file complaints about officers with relative ease would enhance accountability and ultimately result in fewer deaths involving the agency. One potential explanation for these findings could be that agencies may have adopted some of these policies in response to a high pre-existing ARD rate. It may also be the case that not having documentation requirements is associated with an unidentified subset of agencies with lower relative death rates.

Table 4. *Modeled associations with agency ARD rate: Documentation requirements*

Characteristics	Estimate	SE	t value	p	IRR	Sig.
Documentation required (Ref: Yes)						
Use firearm (No)	−0.473	0.231	−2.050	0.040	0.623	*
Display firearm (No)	0.020	0.089	0.225	0.822	1.020	
Baton (No)	−0.563	0.280	−2.009	0.045	0.570	*
Closed hand techniques (No)	−0.089	0.155	−0.577	0.564	0.915	
Other chemical agents (No)	0.007	0.322	0.023	0.982	1.007	
Leg hobble or other restraints (No)	−0.066	0.109	−0.609	0.543	0.936	
Neck restraints (No)	−0.461	0.267	−1.726	0.085	0.630	
Open hand techniques (No)	0.065	0.119	0.548	0.584	1.068	
Soft projectiles (e.g., bean bags) (No)	−0.259	0.366	−0.708	0.479	0.772	
OC spray (No)	−0.369	0.372	−0.992	0.321	0.691	
Display TASER (No)	−0.069	0.086	−0.802	0.423	0.933	
Use TASER (No)	0.053	0.306	0.174	0.862	1.055	
Takedown techniques (No)	0.094	0.129	0.723	0.470	1.098	
Body-worn camera (No)	−0.130	0.092	−1.419	0.156	0.878	
Website to report complaints (No)	−0.191	0.080	−2.399	0.016	0.826	*

Note: *p < .05, **p < .01, ***p < .001. Quasi-Poisson models predicting count of total ARDs per population served in 2013 and 2016. IRR = incident rate ratio; Ref = reference category; SE = standard error; Sig = statistical significance. Models use survey weights for both the 2013 and 2016 LEMAS summed and divided by 2. Control variables measuring aspects of the community (i.e., racial and ethnic makeup; age; income/poverty threshold; violent crime rate) are included in these models but not shown. Offset = total population served.

Table 5 describes the associations between agency demographic makeup with the agency ARDs per 100,000 population served, controlling for the same community sociodemographic and violent crime rate measures as in Tables 3 and 4. The only significant association was the proportion of White personnel in an agency. Specifically, agencies with White personnel in the lowest quintile (<20%) had 42% more ARDs per 100,000 population served than agencies in the middle quintile White personnel. This finding contrasts with past research that finds agency diversity leads to lower rates of use of force. However, it could be that this effect captures agencies that are in places like rural areas with low population density that may have less diverse agencies but also fewer police–public interactions and ultimately fewer ARDs. Overall, during this period, it appears that agency demographics, as measured here, do not have a significant bearing on whether agencies will experience an ARD. However, readers should keep in mind that the agencies examined here comprised a relatively small percentage of officers who were non-white or female (see Table 1). Therefore, caution must be used in interpreting these results.

Table 5. *Modeled associations with agency ARD rate: Officer characteristics*

Characteristics	Estimate	SE	t value	p	IRR	Sig.
Officer						
% White (ref = 3rd Quintile)						
1st Quintile	0.349	0.146	2.393	0.017	1.418	*
2nd Quintile	0.179	0.128	1.399	0.162	1.197	
4th Quintile	−0.349	0.184	−1.897	0.058	0.705	
5th Quintile	−0.351	0.309	−1.133	0.257	0.704	
% Black (ref = 3rd Quintile)						
1st Quintile	−0.302	0.218	−1.386	0.166	0.740	
2nd Quintile	−0.343	0.258	−1.331	0.183	0.710	
4th Quintile	0.094	0.118	0.798	0.425	1.099	
5th Quintile	−0.115	0.183	−0.628	0.530	0.891	
% Hispanic (ref = 3rd Quintile)						
1st Quintile	−0.186	0.229	−0.813	0.416	0.830	
2nd Quintile	0.007	0.253	0.026	0.979	1.007	
4th Quintile	0.078	0.125	0.620	0.535	1.081	
5th Quintile	0.259	0.153	1.691	0.091	1.296	
% Female (ref = 3rd Quintile)						
1st Quintile	−0.143	0.319	−0.449	0.653	0.866	
2nd Quintile	−0.006	0.154	−0.038	0.969	0.994	
4th Quintile	0.188	0.102	1.850	0.064	1.207	
5th Quintile	0.126	0.129	0.979	0.328	1.135	

Note. *p < .05, **p < .01, ***p < .001. Quasi-Poisson models predicting count of total ARDs per population served in 2013 and 2016. Ref = reference category. SE = standard error. IRR = incident rate ratio. Sig = statistical significance. Models use survey weights for both the 2013 and 2016 LEMAS summed and divided by two. Control variables measuring aspects of the community (i.e., racial and ethnic makeup; age; income/poverty threshold; violent crime rate) are included in these models but not shown. Offset = total population served.

Table 6 shows the results from the statistical models testing the association between agency type and different use of force authorizations on OIS deaths only, controlling for community contextual characteristics. Similar to the model of all ARDs, the agency type remains a significant predictor of OISs, with sheriff's offices associated with 67% more OIS deaths than municipal police departments. For the level of authorization for each policy type, the associations between restrictive (not authorized) use of batons, soft projectiles, and physical techniques remained significant and negative, meaning that agencies that did not authorize these uses of force had significantly fewer OISs than agencies that authorized their use. One change between the total ARDs models and the OISs models is that TASER policies are no longer significantly associated with fewer OISs. Moreover, agencies that do not authorize the use of other chemical agents are associated with roughly 25% fewer OISs than those who do authorize this type of force. The pattern of association remains similar to that of total ARDs, and agencies that have more restrictive policies on baton use, certain less-than-lethal weapons, and physical restraints have fewer OISs per 100,000 population served, controlling for aspects of the community served by the law enforcement agency.

Table 6. *Modeled associations with agency OIS rate: Agency type and use of force authorization*

Characteristics	Estimate	SE	t value	p	IRR	Sig.
Sheriff's office (Ref: Police)	0.515	0.138	3.727	0.000	1.674	***
Authorization (Ref: Authorized)						
Baton (Some)	−0.024	0.205	−0.116	0.908	0.976	
Baton (Not Authorized)	−0.833	0.317	−2.626	0.009	0.435	**
Other chemical agents (Some)	0.003	0.091	0.038	0.970	1.003	
Other chemical agents (Not Authorized)	−0.285	0.117	−2.441	0.015	0.752	*
Leg hobble or other restraints (Some)	−0.256	0.170	−1.506	0.132	0.774	
Leg hobble or other restraints (Not Authorized)	−0.250	0.117	−2.140	0.032	0.778	*
Neck restraints (Some)	−0.092	0.268	−0.343	0.732	0.912	
Neck restraints (Not Authorized)	−0.339	0.103	−3.304	0.001	0.713	***
Soft projectiles (e.g., bean bags) (Some)	−0.004	0.086	−0.044	0.965	0.996	
Soft projectiles (e.g., bean bags) (Not Authorized)	−0.513	0.144	−3.570	0.000	0.599	***
Closed hand techniques (Some)	−0.537	0.661	−0.812	0.417	0.585	
Closed hand techniques (Not Authorized)	−0.096	0.164	−0.586	0.558	0.908	
Open hand techniques (Some)	−0.021	0.580	−0.036	0.971	0.979	
Open hand techniques (Not Authorized)	−0.181	0.328	−0.552	0.581	0.835	
OC spray (Some)	0.075	0.188	0.401	0.688	1.078	
OC spray (Not Authorized)	−0.408	0.357	−1.143	0.253	0.665	
TASER (Some)	−0.044	0.129	−0.343	0.731	0.957	
TASER (Not Authorized)	−0.340	0.192	−1.767	0.077	0.712	
Takedown techniques (Some)	−0.113	0.493	−0.229	0.819	0.893	
Takedown techniques (Not Authorized)	−0.282	0.301	−0.937	0.349	0.754	
Vehicle pursuit policy (Ref: Bans)						
Discourages	−1.089	0.833	−1.308	0.191	0.337	
Restricts	−0.374	0.738	−0.507	0.612	0.688	
Discretion of officer	−0.398	0.747	−0.532	0.594	0.672	
No Policy	−2.398	1.147	−2.090	0.037	0.091	*

Note: *p < .05, **p < .01, ***p < .001. Quasi-Poisson models predicting count of OISs per population served in 2013 and 2016. IRR = incident rate ratio; Ref = reference category; SE = standard error; Sig = statistical significance. Models use survey weights for both the 2013 and 2016 LEMAS summed and divided by two. Control variables measuring aspects of the community (i.e., racial and ethnic makeup; age; income/poverty threshold; violent crime rate) are included in these models but not shown. Offset = total population served.

Table 7 shows the associations between agency documentation requirements with OIS rates, controlling for community contextual characteristics. Like the models predicting the total ARD rate, these models found that agencies not requiring documentation of baton usage and not having a website to report complaints were related to fewer OISs than agencies requiring

documentation of baton usage or having such a website. When examining OISs as opposed to all ARDs, the effect of documentation for firearm use is no longer significant.

Table 7. *Modeled associations with agency OIS rate: Documentation requirements*

Characteristics	Estimate	SE	t value	p	IRR	Sig.
Documentation required (Ref: Yes)						
Use firearm (No)	−0.249	0.216	−1.156	0.248	0.779	
Display firearm (No)	0.012	0.094	0.129	0.897	1.012	
Baton (No)	−0.773	0.247	−3.137	0.002	0.462	**
Soft projectiles (e.g., bean bags) (No)	−0.335	0.366	−0.916	0.360	0.715	
OC spray (No)	−0.570	0.337	−1.691	0.091	0.565	
Display taser (No)	−0.058	0.093	−0.618	0.536	0.944	
Use taser (No)	−0.003	0.286	−0.011	0.991	0.997	
Takedown techniques (No)	0.125	0.145	0.860	0.390	1.133	
Closed hand techniques (No)	−0.211	0.174	−1.212	0.225	0.810	
Other chemical agents (No)	−0.306	0.360	−0.850	0.395	0.736	
Leg hobble or other restraints (No)	−0.112	0.112	−1.000	0.318	0.894	
Neck restraints (No)	−0.403	0.278	−1.450	0.147	0.669	
Open hand techniques (No)	0.110	0.132	0.837	0.403	1.116	
Body-worn Camera (No)	−0.104	0.098	−1.059	0.290	0.902	
Website to report complaints (No)	−0.263	0.087	−3.025	0.003	0.769	**

Note: *p < .05, **p < .01, ***p < .001. Quasi-Poisson models predicting count of OISs per population served in 2013 and 2016. Ref = reference category. SE = standard error. IRR = incident rate ratio. Sig = statistical significance. Models use survey weights for both the 2013 and 2016 LEMAS summed and divided by 2. Control variables measuring aspects of the community (i.e., racial and ethnic makeup; age; income/poverty threshold; violent crime rate) are included in these models but not shown. Offset = total population served.

Table 8 shows how agency characteristics are associated with OIS rates while controlling for aspects of the community served. Agencies at the lowest quintile of Black personnel were associated with fewer OISs relative to agencies that were in the middle quintile (see Table 1 for the range of percentages included in each quintile). Additionally, agencies in the top quintile of White personnel were associated with fewer OISs than agencies in the middle quintile. These patterns are again in an unexpected direction, yet they could still potentially be explained by other factors not accounted for in our models.

Table 8. *Modeled associations with agency OIS rate: Officer characteristics*

Characteristics	Estimate	SE	t value	p	IRR	Sig.
Officer						
% Black (Ref = 3rd Quintile)						
1st Quintile	−0.508	0.236	−2.149	0.032	0.602	*
2nd Quintile	−0.372	0.285	−1.302	0.193	0.690	
4th Quintile	0.104	0.120	0.862	0.389	1.109	
5th Quintile	−0.015	0.183	−0.082	0.934	0.985	
% White (Ref = 3rd Quintile)						
1st Quintile	0.281	0.155	1.815	0.070	1.324	
2nd Quintile	0.141	0.135	1.042	0.297	1.151	
4th Quintile	−0.573	0.225	−2.549	0.011	0.564	*
5th Quintile	−0.434	0.318	−1.364	0.173	0.648	

Characteristics	Estimate	SE	t value	p	IRR	Sig.
% Hispanic (Ref = 3rd Quintile)						
1st Quintile	−0.385	0.245	−1.571	0.116	0.681	
2nd Quintile	−0.144	0.262	−0.550	0.582	0.866	
4th Quintile	0.105	0.128	0.821	0.412	1.111	
5th Quintile	0.195	0.159	1.222	0.222	1.215	
% Female (Ref = 3rd Quintile)						
1st Quintile	−0.489	0.370	−1.322	0.186	0.613	
2nd Quintile	−0.080	0.167	−0.478	0.632	0.923	
4th Quintile	0.167	0.106	1.570	0.117	1.181	
5th Quintile	0.165	0.137	1.204	0.229	1.179	

Note: *p < .05, **p < .01, ***p < .001. Quasi-Poisson models predicting count of OISs per population served in 2013 and 2016. Ref = reference category. SE = standard error. IRR = incident rate ratio. Sig = statistical significance. Models use survey weights for both the 2013 and 2016 LEMAS summed and divided by 2. Control variables measuring aspects of the community (i.e., racial and ethnic makeup; age; income/poverty threshold; violent crime rate) are included in these models but not shown. Offset = total population served.

Limitations

The analyses presented in this section, both the bivariate and multivariable cross-sectional models, are informative but come with inherent limitations that should be kept in mind when reviewing the results. First, as has been mentioned previously, there are some limitations with the data sources used here that limited the focus to certain years or measures. With regard to ARDs, the Fatal Encounters data may not represent all ARDs associated with the agencies in the LEMAS sample; however, research has noted that the Fatal Encounters database provides some of the most complete data available to researchers on the phenomena of ARDs (Feldman et al., 2017). Similarly, the analyses conducted here were limited to the measures included consistently in each wave of the LEMAS survey. Second, the bivariate relationships between key agency characteristics and the rate of ARDs do not control for any potential confounding characteristics and thus should be interpreted with caution. Third, the multivariable models control for some of these potential confounders, including the sociodemographic context of the community served by the agency (i.e., race and ethnic makeup, age distribution, income/poverty) and the violent crime rate, yet there may be other unobserved characteristics of the community or the agency that are associated more or less with ARDs that are not accounted for in these models. Finally, the analyses presented here are cross-sectional, thus we are not able to parse whether changes in agency policies or characteristics relate to changes in ARDs. Because of the cross-sectional nature of these analyses, we cannot establish the temporal ordering of the key agency factors tested (e.g., policy restrictiveness or demographic makeup) and the count of ARDs associated with each agency.[27] In the next section, we attempt to mitigate some of these limitations by examining the change in a smaller subset of agency characteristics over time and how these may or may not correspond to changes in ARDs over the same period.

[27] By temporal ordering, we mean whether agency policies may have *preceded* or *succeeded* any ARDs experienced by the agency.

Summary of Agency Characteristics and Associations with ARDs

- In 2013 and 2016, most law enforcement agencies in the United States had no ARDs.
- During the same period, 5.4% of agencies had at least 1 ARD and 4.3% of agencies had at least 1 OIS.
- Sheriff's offices tended to have higher rates of total ARDs and OISs than municipal police.
- Agencies with *more restrictive* use of force policies were associated with fewer ARDs and OISs per population served when controlling for sociodemographic context and violent crime rate of the community served.
    - For total ARDs, agencies not authorizing the use of **batons, leg hobbles or other restraints, neck restraints, soft projectiles,** and **TASERs** were associated with fewer ARDs per population served than agencies that authorized these force tactics for all personnel when controlling for sociodemographic context and violent crime rate of the community served.
    - For OISs, agencies not authorizing the use of **batons, leg hobbles or other restraints, neck restraints, soft projectiles,** and **other chemical agents** were associated with fewer OISs per population served than agencies that authorized these force tactics for all personnel when controlling for sociodemographic context and violent crime rate of the community served.
- Agencies that did not require documentation for baton use were associated with fewer total ARDs and OISs, and agencies that did not require documentation for firearm use were associated with fewer ARDs.
- Agencies that did not have a website for citizens to report complaints were associated with fewer ARDs and OISs.
- Agencies with fewer White personnel were associated with more ARDs in the secondary analysis. The environmental scan of the scientific and grey literature found mixed evidence on the relationship between the demographic makeup of law enforcement agencies and officer use of force and ultimately ARDs. This secondary analysis finding also runs counter to some existing evidence that finds Black officers are less likely than White officers to use force. Differences in these findings may be driven, in part, by differences across studies in the unit of analysis (i.e., individual officer vs. agency distribution), research design, and outcome of interest.

Examining Agency Characteristics and ARDs Over Time

To examine the association between agency characteristics and fatal encounter outcomes (all deaths and OIS deaths) while controlling for potentially confounding agency-level factors, we also estimated conditional fixed-effects Poisson regressions with robust standard errors using the merged Fatal Encounters counts of ARDs per agency and year with the 2013, 2016, and 2020 waves of the LEMAS survey.[28] Because these models depend on having multiple

[28] As noted in the Methodology section, these longitudinal models (fixed-effects Poisson regression models) control for all between-agency differences, including time-stable unobserved differences. Therefore, community

timepoints per agency and at least one death across observed timepoints, the analysis sample includes only a subset of general purpose agencies in the LEMAS certainty strata.[29] These models are also limited to agency characteristics measured in each of the past three LEMAS waves. So, although they correct for potentially unobserved characteristics that may impact an agency's fatal encounter propensity in a way that the pooled cross-sectional models cannot, they address fewer characteristics and are less representative of the law enforcement agency population overall. Despite these limitations, however, the models described below are able to demonstrate whether important characteristics of an agency, including its demographic makeup, use of body-worn cameras, and educational requirements for officer recruits are associated with changes in ARDs between 2013, 2016, and 2020. These are all important variables to examine, given they have been the subject of much research on use of force and ARDs (Gaston et al., 2021; Lum et al., 2019; Miller, 2015) and recent calls for reform to prevent unnecessary deaths. For instance, some research has found that female and minority officers use force less often and therefore may lead to lower rates of use of force and, by consequence, ARDs (Gaston et al., 2021; Rabe-Hemp, 2008; Schuck & Rabe-Hemp, 2005). Additionally, some research on the educational requirements of officer recruits finds that officers who are more educated (e.g., have a 4-year degree) are less likely than those without higher degrees of engaging in use of force (Miller, 2015). The analyses presented in this section analyze whether these potentially important agency factors are associated with changes in ARDs over three time points: 2013, 2016, and 2020.

Tables 9 and 10 show the results of the fixed-effects Poisson models modeling the count of ARDs and OISs per population served as a function of key agency characteristics, respectively. These models included the population served as an offset, which effectively turns the outcome, as represented by IRRs, into a rate of ARDs per population served. Using the first agency characteristic as an example (percentage female), the interpretation of the IRRs is that controlling for all between-agency differences, an increase in 1 percentage point in the percentage of female personnel in the agency is associated with a 1% increase in the number of ARDs per population served in the next time point. However, in this example, and for all other agency variables except for the percentage of unknown race, the associations are not statistically significant.[30] These null associations are not in line with what would be expected based on the prior research outlined previously that examines these characteristics in relation to use of force or ARDs. However, there are limitations with the analysis conducted here. For instance, it could be that for the percentage of female personnel, there is a certain magnitude of change required, a nonlinear effect, or a threshold percentage that should be exceeded to make a difference in the number of ARDs in which an agency tends to be involved. This

controls from the ACS and FBI's UCR data were not necessary to include in these models. Additionally, because this analysis used only the large agencies included in the LEMAS survey with certainty, no survey weights were applied to the analysis. The results therefore generalize to large municipal police departments and sheriff's offices in the United States.

[29] The LEMAS certainty strata include large agencies (greater than 100 full-time equivalent sworn).

[30] At the $p < .05$ level.

threshold rationale is consistent with what Smith (2003) found in his study of agency characteristics and police-caused homicides. Specifically, he found that agencies with a higher proportion of female officers were related to greater numbers of police-caused homicides but only in smaller cities (100,000 population plus) and not in larger cities (250,000 population plus). Upon further examination, he found that in larger cities, the share of female officers was much larger than in the smaller cities and speculated that in these agencies with smaller shares of female officers, there may exist pressure to act in accordance with a male-dominated culture (Smith, 2003).

Table 10 showcases the estimated associations between agency characteristics and OISs in particular, and the results are also null. RTI also conducted supplemental analyses to ascertain to what degree the key agency characteristics changed over the three time points. The results revealed that on average, the sample agencies did not change in their demographic makeup, educational requirements, or whether they had body-worn cameras over the three periods. On average, the amount of change in these characteristics was around zero (i.e., little to no change in these characteristics over time).

Table 9. *Modeled associations with ARDs over time: 2013, 2016, 2020*

Agency characteristics	IRR	SE	Sig.
% Female	1.01	.013	
% Black	1.01	.013	
% Hispanic	1.01	.008	
% American Indian	0.93	.093	
% Asian	0.98	.026	
% Hawaiian Pacific Islander	1.02	.036	
% Multiracial	1.03	.022	
% Unknown	0.99	.003	*
Body-worn cameras (1 = yes)	0.95	.069	
Minimum education requirement (Ref = 4-year degree required)			
2-year college degree required	1.80	.729	
Some college, no degree required	1.73	.669	
High school diploma or equivalent required	1.55	.648	
No formal education requirement	2.19	1.19	
No. of agencies	553		
No. of observations	1,503		

Notes: *p < .05, **p < .01, ***p < .001. IRR = incident rate ratio; SE = standard error; Sig = significance level; Ref = reference group. Results of fixed-effects Poisson regression models using clustered standard errors. Number of agencies include those that had at least one ARD over the 3-year period (265 agencies were removed) and that were included in at least two waves of the LEMAS survey (212 agencies were removed). Observations equal the number of agencies times the number of time points (3). Exposure variable is population served.

Table 10. *Modeled associations with OISs over time: 2013, 2016, 2020*

Agency characteristics	IRR	SE	Sig.
% Female	1.01	.014	
% Black	1.01	.012	
% Hispanic	1.01	.010	
% American Indian	0.97	.090	
% Asian	0.97	.028	
% Hawaiian Pacific Islander	0.99	.036	
% Multiracial	1.03	.023	
% Unknown	1.00	.003	
Body-worn cameras (1 = yes)	1.04	.084	
Minimum education requirement (Ref = 4-year degree required)			
2-year college degree required	1.80	.773	
Some college, no degree required	1.71	.703	
High school diploma or equivalent required	1.68	.758	
No formal education requirement	2.71	1.54	
N of agencies	491		
N of observations	1,337		

Notes: *p < .05, **p < .01, ***p < .001. IRR = incident rate ratio; SE = standard error; Sig. = significance level; Ref = reference group. Exposure variable is population served. Results of fixed-effects Poisson regression models using clustered standard errors. Number of agencies include those who had at least one OIS over the 3-year period (327 agencies were removed) and that were included in at least two waves of the LEMAS survey (212 agencies were removed). Observations equal the number of agencies times the number of time points (3).

Limitations

Similar to the cross-sectional analyses of agency characteristics and ARDs, the longitudinal analyses had some limitations. First, the lack of comparable measures across the three waves of the LEMAS precluded a test of the relevance of certain use of force policies on ARDs over time. Given past research, the agency characteristics tested here are also salient when examining ARDs. However, the potential association between changes in policies and practices related to use of force and ARDs would be particularly useful to inform whether the adoption of certain use of force policies could help mitigate such deaths. Second, these analyses were limited to agencies within the large agency certainty strata of the 2013, 2016, and 2020 LEMAS surveys (i.e., agencies with at least 100 full-time equivalent sworn). Therefore, the results apply to these large agencies only. It may be that the null relationships uncovered here do not apply the same way to smaller agencies. As Smith (2003) found, agency size may be relevant to the influence of some agency characteristics.

Summary of Agency Characteristics and Associations with ARDs Over Time

- For large agencies (those with at least 100 full-time equivalent sworn) who experienced at least one ARD or OIS in 2013, 2016, or 2020:
  - There was a *null* association between certain agency characteristics, including the percentage female personnel, racial makeup, whether the agency used body-worn cameras, and the minimum education requirements, and change in ARDs or OISs over time during 2013, 2016, and 2020.
  - There was also minimal change in these agency characteristics over time.

Summary of the Secondary Analyses on ARDs

In this report thus far, we have leveraged crowdsourced data on ARDs from Fatal Encounters and from law enforcement administrative data collected by the BJS to describe and assess the agency-level characteristics associated with ARDs during the 2013, 2016, and 2020 periods. Descriptive analyses using these integrated data show that most law enforcement agencies did not experience a death during these periods. Additionally, we demonstrated that the majority of ARDs occurring in the United States are OISs. In cross-sectional statistical models assessing the agency characteristics that were more or less associated with ARDs, we showed that more restrictive TASER, baton, and chokehold policies were associated with fewer ARDs in 2013 and 2016 compared with agencies that had more permissive policies when controlling for the sociodemographic characteristics and level of crime in the community served by the agency.

We also looked at how select agency characteristics are associated with changes in ARDs over time from 2013 to 2016 to 2020 in large agencies. Using longitudinal statistical models controlling for between-agency differences, we found that neither agency changes in demographic makeup (i.e., share of female personnel or share of different racial/ethnic groups), nor changes in use of body-worn cameras, nor changes in educational requirements for officers were related to changes in ARDs over these periods. However, we also found that these large agencies did not change much in these characteristics over the 8-year time frame.

Although there were some limitations to these analyses, the findings from the secondary analysis of the Fatal Encounters and LEMAS data demonstrate some important agency-level factors associated with ARDs that can be explored further in future research. In addition to these analyses, we also conducted an environmental scan of research on agency policies and practices related to ARDs that leverage other data sources and periods. The findings from this environmental scan of the research are summarized in the remainder of this report.

Review of the Literature on Factors Related to ARDs

The vast majority of ARDs occurring in the United States are the result of OISs. However, there are other manners in which people die when interacting with law enforcement, as demonstrated by the secondary analysis. People may die from the use of less lethal options, such as TASERs or physical tactics such as chokeholds that result in medical emergencies. The full scope of use of force techniques available to law enforcement officers and the situations in which these techniques are allowable vary across jurisdictions. This next section reviews a range of literature to examine how the breadth of agency policies, practices, and characteristics of agencies themselves impact ARDs. Some research has focused on the situations and contexts in which use of force, including fatal uses of force, are more prevalent. However, most research examined in this section revolves around organizational policies and practices that have been examined to reduce ARDs or officer behaviors that may lead up to deaths. This includes trainings and practices designed to improve officer decision-making, reduce use of force by officers, or improve contacts between law enforcement and the public. This also includes agency-level or external accountability measures designed to prevent or deter excessive uses of force, and ultimately, death occurring from use of force.

Use of Force Overview and Lethality

Law enforcement officers regularly interface with members of the public, either through police-directed contact or when responding to requests for service. Through these interactions, officers may sometimes be required to use force to gain compliance. Indeed, the legitimate use of force is one of the functions that distinguishes law enforcement from other professions (Bittner, 1970). Although the definition of an appropriate use of force varies somewhat from jurisdiction to jurisdiction, some commonalities exist. Ultimately, all are guided by the Supreme Court ruling in *Graham v. Connor* (1989), in which the court ruled that legitimate uses of force by law enforcement officers should be objectively reasonable. In addition to this standard, many definitions of appropriate use of force contain frequent references to terms associated with the idea of respect for human life (DHS, 2018; IACP, 2020; MCCA, 2021; New Jersey Office of the Attorney General, 2022). For example, there is reference to the "value" or "sanctity" of human life included in definitions from the International Association of Chiefs of Police (IACP), Major Cities Chiefs Association (MCCA), Department of Homeland Security (DHS), State of New Jersey, and State of Vermont. Regarding the gravity of a given situation and whether use of force is justifiable, the term "objectively reasonable" (DHS, 2018; IACP, 2020; PERF, 2015) is frequently used, as is "reasonable and necessary" (MCCA, 2021).

Most agencies employ guiding models of the level of force that should be used in different circumstances to protect against excessive uses of force. Some agency models are structured as a hierarchical flow (Table 11). This flow is referred to as a use of force continuum that spans the range of actions that law enforcement officers can take in an interaction with a civilian—from less serious actions such as verbal commands to the most serious action, which is use of lethal force. Officers do not have to follow each step of the continuum in sequence during an

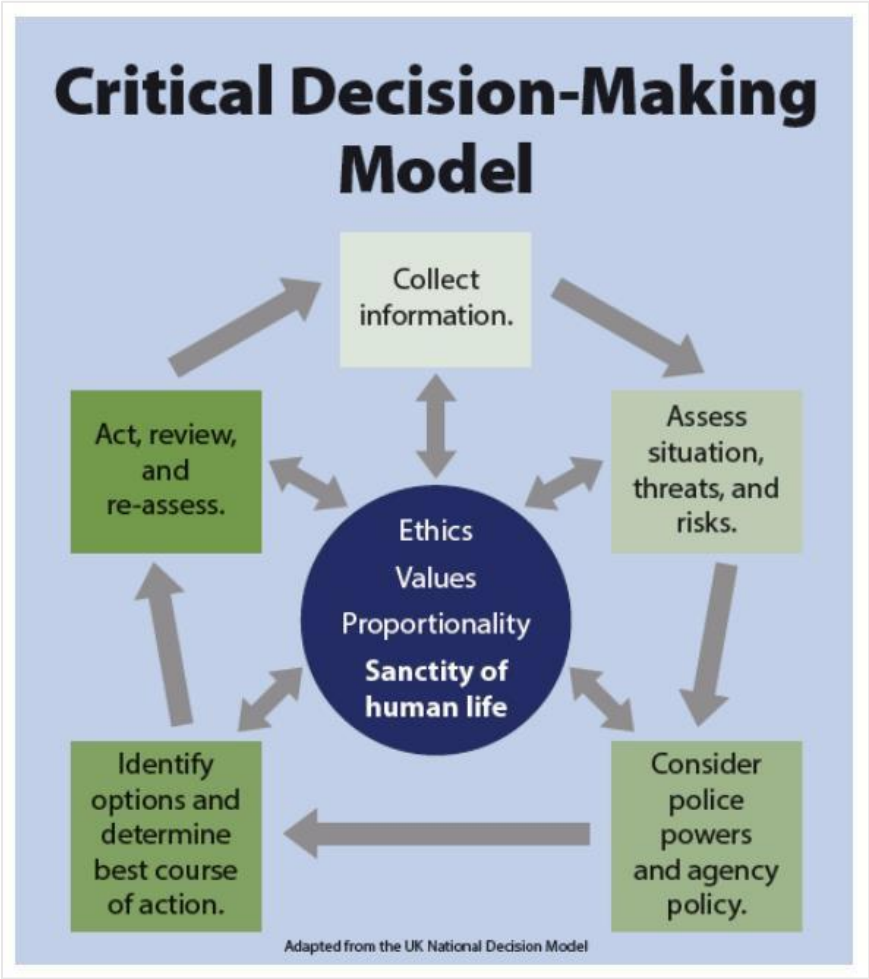
interaction but rather use the level of force commensurate with the behavior of the subject involved in the interaction.

Table 11. *Example use of force hierarchical flow*

Action	Force type	Description
Officer Present	Force presence	Officers' attitudes are professional and nonthreatening. Their presence alone works to deter crime or diffuse a situation. Visual presence in uniform, equipment, and marked cars convey signs of authority.
Verbalization	Non-physical force	Issuance of calm, nonthreatening commands. Volume and length of commands may shorten to gain compliance. For example "Stop what you're doing" may become "Stop."
Empty-Hand Control	Bodily force only	Bodily force is used to gain control of a situation.
Less Lethal Methods	Less lethal technologies	Less lethal technologies used to gain control of a situation: Blunt impact—baton or projectile to immobilize; chemical—chemical sprays or projectile; conducted energy devices–discharge a high-voltage low amperage jolt of electricity.
Lethal Force	Use of deadly weapons	Officers use deadly weapons (e.g., firearms) to gain control of a situation when a suspect poses a serious threat to the officer or another individual.

Another model is the Critical Decision-Making Model (Figure 22), which was adapted from the United Kingdom's National Decision Model and recommended by PERF (PERF, 2015). This model does not delineate specific use of force actions but rather provides a framework for decision-making during critical incidents. The model represents a circular process in which officers first collect information on the incident and then use that information to assess the situation at hand (i.e., what are the threats or risks present). Officers then identify the best course of action from their set of available options based on the assessment of the situation, as well as knowledge of agency policy and police powers. The last stage of this model has officers act on their decided course of action, followed by a review and reassessment of the situation (PERF, 2015). Decision-making models such as the Critical Decision-Making Model and the use of force continuum provide guidance to police officers on the appropriate level of force that is warranted in a situation, thus mitigating the potential for excessive uses of force.

Figure 22. *Critical decision-making model*



Source: PERF (2015).

In addition to agency-level guidelines, use of force by law enforcement is also regulated by legislation at the state level. As of June 2023, 43 states and the District of Columbia have legislation surrounding use of force, according to the National Conference on State Legislatures. After George Floyd's death during an interaction with a Minneapolis police officer in May 2020, many jurisdictions reassessed their policies and standards surrounding use of force. This reassessment resulted in the enactment of new laws or amendment of existing ones in jurisdictions across the country (IACP, 2020). Some common changes that have occurred in use of force legislation during this period include (1) a specific focus on de-escalation by requiring law enforcement agencies to provide de-escalation training (e.g., Iowa Code § 80B.11G [2020]); (2) a duty to intervene requirement that compels witnessing officers to disrupt or attempt to stop another officer's use of excessive force; (3) a requirement to report acts of excessive force (e.g., Colo. Rev. Stat. § 18-8-802 [2020]; N.H. Rev. Stat. Ann. § 105:19 [2020]); and (4) a prohibition (e.g., Cal. Gov't Code § 7286.5 [2020]) or restriction (e.g., Conn. Gen. Stat. § 53a-22

[2020]) on the use of chokeholds. These legislative and policy changes to use of force guidelines are ultimately intended to reduce the likelihood of police–citizen interactions ending in death.

Research shows that use of force incidents rarely result in death (Bozeman et al., 2018). Yet, there are some characteristics of individuals and of incidents themselves that make death more or less likely in a use of force event (PERF, 2021). For example, Nix and Shjarback (2021) examined victim-level data on fatal and non-fatal OISs from Florida, Colorado, Texas, and California. They found that nearly one-half (45%) of the police shooting victims in their multi-state sample did not die from their injury. In their statistical model predicting the odds of an OIS ending fatally, they found that race, age, and whether the individual was armed were all important factors predicting fatality, even when controlling for the presence of a trauma center, urbanicity, and state in which the shooting occurred. Specifically, they found that Black victims were less likely than White victims to die from their wounds, and younger people (25 and younger) were less likely than people older than 25 to die from their wounds (Nix & Shjarback, 2021). The finding that Black victims and younger people were found to be less likely to die from an OIS is echoed in at least one other study assessing data from 11 large law enforcement agencies (Hanink et al., 2023).

In addition to victim characteristics, situational aspects of OIS incidents have been linked to the likelihood of fatality (Hanink et al, 2023; Jennings et al., 2020; Nix & Shjarback, 2021). For example, whether an individual was armed at the time they were shot by police has been shown to matter. Nix and Shjarback (2021) found that individuals who were armed at the time they were shot were more likely to die than those who were unarmed. Using data on OISs from Texas, Jennings and colleagues (2020) also found that incidents in which the subject was armed were more likely to result in a fatality than those in which the subject was unarmed. OIS incidents in which there were more officers present on the scene were also more like to end fatally according to at least one study (Hanink et al., 2023). Hanink and colleagues (2023) pooled and analyzed OIS incidents from 11 police departments and sheriff's offices across multiple periods. Their fully adjusted statistical model revealed that having more officers present on the scene increased the chance that an OIS would end fatally, specifically finding a 33% increase in lethality for every additional officer present at a shooting (Hanink et al., 2023). Once a shooting has occurred, the availability of adequate medical treatment may also play a role in whether an OIS victim lives or dies. In the same study of 11 agencies' police-involved shooting data, Hanink and colleagues (2023) found that a greater distance or drive time to a Level 1 trauma center was associated with a decreased likelihood of survival for an OIS victim. However, once controlling for a series of individual and situational characteristics of the incident, including victim race, age, and number of officers on the scene, the drive time to a trauma center was no longer significantly related to likelihood of death (Hanink et al., 2023). In summary, although use of force events rarely end in the death of the individual involved, there are certain characteristics of the incident and the individual involved, including age, race, whether the individual was armed, and the number of officers on scene, that make an ARD more likely.

Apart from understanding the factors that make use of force incidents more or less lethal, this environmental scan highlights the factors that may or may not impact the overall prevalence of deaths occurring during an interaction with law enforcement. In the next section, we summarize the state of the literature on how different factors, including contextual features of places, individual and situational characteristics, and agency characteristics are associated with ARDs. We follow this summary by leveraging these findings into several recommendations aimed at reducing or preventing ARDs.

Contextual Factors Related to ARDs

Contextual factors refer to various aspects of the environment leading up to an ARD. Various contextual factors have been associated with ARDs.

Location, Urbanicity, and Population Size

Geographic location, population size, racial diversity, and socioeconomic context have been linked to variation in ARDs. Some research finds that certain regions of the United States have more ARDs than others. The Global Burden of Disease 2019 Police Violence U.S. Subnational Committee contributors examined National Vital Statistics System and crowdsourced ARD data between 1980 and 2019. They found that some states, including those geographically located in the Western and Southwestern part of the United States, have higher rates of ARDs than others, but the state-to-state variation in ARDs differs for people of different races (GBD 2019 Police Violence U.S. Subnational Collaborators, 2021). Furthermore, Schwartz and Jahn (2020) used mapping efforts to examine violence in metropolitan areas across the United States, finding that Southwestern metropolitan areas had the highest rates of ARDs whereas the Midwest and Northeast had the lowest rates. Of the fatalities examined, 94% were from gunshot wounds.

There is evidence that population size is associated with rates of ARDs as well. At the state level, Gray and Parker (2019) found a negative relationship between population size and shooting rates. Specifically, as the population size increases, OIS rates decrease. This also holds true when looking at changes in population by race, with an increase in the Black and White population being associated with a decrease in OISs against Black and White individuals, respectively. Urbanicity captures the population density of places, which may also impact the likelihood of police interactions and fatalities. In a study of rural versus urban areas for police shootings, Hemenway et al. (2020) found little difference between rural and urban areas when it came to OISs, yet these findings differed by race. Specifically, the rates of OISs were higher in rural areas for White victims whereas the rates were higher in urban areas for Black victims. In a study spanning four U.S. states, researchers found that victims were less likely to die from their wounds if they were located in a metropolitan county (Nix & Shjarback, 2021). Although this may suggest that proximity to trauma facilities is what contributes to the lethality of OISs, some recent research suggests there is no statistically significant relationship between the

amount of time it takes to get a victim to a medical facility and the lethality of an OIS (Hanink et al., 2023).

Sociodemographic Context

Zare et al. (2022a) examined how location and race factored into OISs. They categorized 3,136 U.S. counties using a Social Vulnerability Index. The Social Vulnerability Index was based on characteristics of diverse communities in terms of social, cultural, political, economic, and institutional factors. They found that majority of the shootings they examined between 2015 and 2022 took place in high Social Vulnerability Index counties—that is, more socially vulnerable counties. Zare et al. (2022a) also found that race played a significant factor in OISs at the county level, with fatal shootings increasing 2.3 times among White individuals, 9.6 times among Black individuals, and 15 times among Hispanic individuals. This supports some other research that has found communities of color suffer higher rates of fatal OISs when these communities have lower median income, a higher poverty ratio, and a higher crime rate (Zare et al., 2022b; Mora et al., 2023). In their study of 3,108 U.S. counties, Maksuta et al (2024) found that the rate of officer-involved homicides was lower in counties with higher percentages of Black or Hispanic population, yet higher in counties with more racial and ethnic diversity.

Mesic et al. (2018) evaluated the impact of structural racism on fatal OISs. They created a state racism index that looked at residential segregation, gaps in incarceration rates, educational attainment, economic indicators, and employment status. Their main outcome was the Black–White disparity ratio of police shooting rates, defined as the ratio of the Black fatal unarmed police shooting rate to the White fatal unarmed police shooting rate (Mesic et al., 2018). They found that for every 10-point increase in their state racism index, the Black–White disparity ratio of police shooting unarmed victims increased by 24%, even controlling for a series of state-level factors, including measures related to population size and density, racial makeup, income inequality, and violent crime (Mesic et al., 2018).

Crime Rate

Research has been somewhat mixed on how the crime rate of an area impacts the rate of ARDs. Some of this ambiguity may be caused by the varied geographic levels of analysis (e.g., neighborhood-, city-, county-, state-level crime rates) and the type of crime being considered across studies. For instance, Nagin's (2020) study of firearm availability and OISs found a null relationship between state-level homicide rates and OISs. At the city level, some studies suggest crime rates do not have an associated impact on OISs (U.S. Commission on Civil Rights, 2018). Additional research at the county level has found that police-involved killings are correlated over time with homicide rates, property crime rates, and assaults on officers (Kopkin, 2019).

Studies that focus on within-city associations of crime rate and ARDs tend to find an association between crime rate, particularly related to violent crime, and ARDs. In his analysis of shootings by New York City police officers between 1971 and 1975, Fyfe (1980) found that violent crime

and arrest rates in New York City neighborhoods were positively related to OISs. Similarly, Klinger and colleagues (2016) found in their study of OISs in St. Louis, MO, between 2003 and 2012 that there was a curvilinear relationship between block group–level firearm violence rates and OISs, controlling for area-level sociodemographic characteristics. Specifically, block groups with higher levels of firearm violence were associated with a higher prevalence of OISs but only up to a certain point. Block groups that had the highest rates of firearm violence were not associated with more OISs. Research in Philadelphia examining the association between the built environment and OISs found that a block group's level of violent crime was the strongest predictor of OISs over a 5-year period (from 2015 through year-end 2019) (Keller et al., 2023). Furthermore, the authors found evidence that violent crime mediated the influence of the built environment (e.g., the presence of check cashing businesses, liquor stores, schools) on OISs (Keller et al., 2023). Although not related to ARDs specifically, research has also found that higher levels of violent crime and disorder within neighborhoods, and on street segments within neighborhoods, contribute to an increased likelihood that officers will use force when policing those neighborhoods (Terrill & Reisig, 2003), likely increasing the subsequent chance of an ARD (Nouri, 2021).

Gun Availability and Ownership

Another contextual feature that has been linked to higher rates of ARDs include state-level gun availability. Research finds that there is a significant association between the statewide prevalence of firearms and the rate of fatal OISs (Hemenway et al., 2019; Nagin, 2020). Using OIS data from *The Washington Post*, Nagin (2020) found that state-level firearm suicides (a proxy for state firearm ownership) was associated with a 0.5% increase in fatal OISs, controlling for proximity to a trauma unit, percentage of the population living in an urban area, homicide rate, and region of the country. When examining these relationships by whether the decedent had a firearm when they were killed, he found that state-level firearm ownership was predictive of OISs of armed but not unarmed decedents (Nagin, 2020). Ultimately, he concluded that in states with a higher prevalence of firearms, police may be more primed to believe a civilian could be armed, even if they are not (Nagin, 2020). Other research at the state level has found that states with higher rates of gun ownership have slightly higher rates of police killing unarmed civilians (Hemenway et al., 2019). Additionally, states with lower restrictions on civilians carrying concealed firearms have been associated with higher rates of OISs (Crifasi et al., 2023).

Individual-Level Factors Related to ARDs

Race and Ethnicity, Age, and Sex

Race and ethnicity are some of the most common factors examined in relation to ARDs, particularly OISs. Much research has investigated potential racial bias in ARDs. Although the overall findings have mixed empirical support, many studies, including some studies discussed previously, show evidence of racial disparities in ARDs. Across all the demographic

characteristics examined in this section, the patterns reported in the literature mostly align with the descriptive analysis of the Fatal Encounters data we present in the first part of this report.

For example, Edwards et al. (2019) examined Fatal Encounters data from 2013 to 2018 to determine the relative risk of being killed by police for different racial and ethnic groups. Creating lifetime mortality estimates for different groups, they found that the lifetime risk of being killed by police use of force[31] was roughly 2.5 times higher for Black men than White men and nearly 1.5 times higher for Black women than White women. Both American Indian and Alaska Native men and women, as well as Hispanic men, had a higher lifetime risk of being killed by police than their White counterparts (Edwards et al., 2019). They also found that relative to their White counterparts, Hispanic women and Asian men and women have a lower lifetime risk of being killed by police (Edwards et al, 2019). Similarly, the Global Burden of Disease 2019 Police Violence U.S. Subnational Collaborators (2021) found in their examination of police killings between 1980 and 2019 that non-Hispanic Black people had the highest age-standardized mortality rate because of ARDs, followed by Hispanic people and then White people.

Contrary to these studies, other researchers have found evidence to suggest there is no difference between racial and ethnic groups in the ratio of deaths when using arrests as the denominator versus the general population (Miller et al., 2017). Examining *The Washington Post*'s OIS data, Miller and colleagues (2017) found that while Black individuals are more likely to be stopped by police and experience physical force during these stops, the rate at which Black individuals are shot relative to their exposure to arrests is not significantly different than other racial and ethnic groups (Miller et al., 2017).

Some research has examined potential disparities across race for adolescents[32] killed by police in particular (Badolato et al., 2020), finding that Black and Hispanic youth are at higher risk for ARDs than White youth. Using data from the Centers for Disease Control and Prevention Web-based Injury Statistics Query and Reporting System, Badolato and colleagues (2020) examined adolescents who died from a firearm injury because of legal intervention[33] from 2003 through 2018. Over the full 16-year time frame, they found that 140 youth had died from legal intervention, with the majority (93%) of these deaths involving firearms. Comparing the relative risk of ARDs for different racial and ethnic groups using the general population as the denominator, they found that non-Hispanic Black youth and Hispanic youth had a higher risk of firearm-related ARDs than non-Hispanic White youth (Badolato et al., 2020).

In terms of the age groups most likely to experience an ARD, Edwards et al.'s (2019) study using the Fatal Encounters data from 2013 to 2018 found that the lifetime risk of being killed by

[31] Edwards et al. (2019) excluded non–use-of-force ARDs from their analyses (e.g., vehicle collisions, suicides) that were recorded in the Fatal Encounters database.
[32] Defined in Badolato et al. (2020) as 12- to-17-year-olds.
[33] "Legal intervention" is a term from the *International Classification of Diseases*, 10th revision

police peaks between the ages of 20 and 35 for all racial and ethnic groups they examined. This age range lines up with what the Global Burden of Disease (GBD) subcommittee (2021) found using multiple sources of ARDs. Also for all race and ethnic groups, the GBD subcommittee (2021) estimated that for men, the highest mortality rate due to police violence was experienced by 25- to 29-year-olds, followed by 30- to 34-year-olds and then 20- to 24-year-olds.

Edwards et al. (2019) also found that men are at much higher risk of being killed by police, based on their analysis of Fatal Encounters data from 2013 to 2018. They specifically found that men have an average lifetime risk of 1 in 2,000 of being killed by police, versus women's average lifetime risk of 1 in 33,000 of being killed by police. This large divergence is consistent with other studies as well. The GBD 2019 subcommittee estimated men experienced 30,600 ARDs between 1980 and 2019, and women experienced 1,420 deaths over this period, translating to a difference of 2,054%.

Summary of Contextual and Individual Factors Related to ARDs

The research has demonstrated that ARDs are not experienced uniformly across places or across people within places. The lethality of police incidents varies for individuals, with older and White victims more likely to die after being shot by police than younger and Black victims. Incidents involving more officers are also more lethal. When individuals die during an interaction with law enforcement, these fatalities vary by region of the country, by state, by neighborhoods, and even by street within neighborhoods. At the state level, gun availability appears to be related to more OISs. County-level and neighborhood-level disadvantage (social vulnerability) is related to more OISs. Furthermore, minority communities that are also disadvantaged experience higher rates of police-involved deaths, despite the research that shows Black victims are less likely to die from use of force relative to White victims. Although crime rate does not appear to be associated with ARDs at the city level based on limited research, several within-city studies of smaller geographies (e.g., block group) find that violent crime rate is related to higher levels of ARDs. In addition to the contextual and individual characteristics associated with ARDs, some agency-level organizational policies and practices are associated with ARDs, as will be discussed in the next section.

Agency Policies and Practices

Use of Force Policies

Many law enforcement agencies revised their use of force policies following the high-profile death of George Floyd during an encounter with Minneapolis police officers in May 2020. Shortly after this incident, the *National Consensus Policy on Use of Force* (*Consensus Policy*). was updated from its previous version drafted 3 years earlier. The *Consensus Policy* was the result of a collaboration among 11 national and international policing organizations, such as the IACP, the National Organization of Black Law Enforcement Executives (NOBLE), the Commission on the Accreditation for Law Enforcement Agencies (CALEA), and the National Association of

Women Law Enforcement Executives (NAWLEE). It was designed as a framework for agencies to use to guide the development of their own use of force policies. The Department of Justice (DOJ) updated its use of force policy in line with the *Consensus Policy* on use of force. Although the overarching principle put forth in the DOJ use of force policy and the *Consensus Policy* is "to value and preserve human life" (IACP, 2020, p. 8), they highlight that individual law enforcement agencies are unique in their needs and in the environments in which they operate, translating to the need for use of force policies tailored to specific contexts. Departments seek to build trust in their communities while increasing accountability in their officers through these policies and programs (U.S. Commission on Civil Rights, 2018).

Agencies vary in their administrative use of force policies, the force continuum used, and their consideration of suspect resistance, and some evaluations suggest that administrative policies have an impact on citizen deaths (Terrill & Paoline, 2013). Fyfe (1978, 1979) evaluated the New York City Police Department's change to more restrictive use of force guidelines, finding that the new guidelines were associated with significant declines in the use of deadly force and in officer injuries. These more restrictive guidelines were part of a temporary operating procedure that limited officer discretion in when they could fire their gun, excluding such actions such as firing a warning shot, shooting at or from a moving vehicle, or discharging a firearm when lives of innocent people may be endangered (Fyfe, 1979). He later concluded that organizational policies impact police shooting discretion and behavior (Fyfe, 1988). Analyzing 2 decades of deadly force data from Philadelphia, White (2001) also found that a use of force policy change to a more restrictive standard resulted in reduced OISs. In this study, White (2001) examines the change in discretion to use fatal force from the "fleeing felon" rule (which permitted the use of deadly force to effect an arrest) to a more restrictive rule that only permitted the use of deadly force when an officer's life was endangered or if the subject posed an immediate threat. Although he found that the increased restrictiveness was associated with fewer OISs, he also notes that agency culture and philosophy may serve as counterweights to any effects from formal policy (White, 2001).

Officer Selection Criteria

There is a good deal of interest in how officer characteristics might influence their use of force. This section addresses this matter and highlights what research says about criteria that agencies might wish to use in officer recruitment, selection, and training. Officer race, gender, level of education, experience, and age may be factors that agency leadership considers when hiring because these characteristics have been linked with ARDs. Other factors such as level of education, experience, and age influence the chance that officers will use force during an interaction with a civilian (e.g., Terrill & Mastrofski, 2002). Research is generally mixed on factors such as gender or race and their influence on the chance of force, which may partly be a function of the varied research designs employed in the literature. We review some of these officer characteristics below.

Gender

Research on gender and the use of force by officers largely suggests that at an individual level, female officers may be less likely to use force during an interaction. Most research suggests that female officers use less force in interactions with the public than their male counterparts because of, for example, differences in socialization (Ba et al., 2021; McElvain & Kposowa, 2008; Rabe-Hemp, 2005, 2008; Schuck & Smith, 2003). In one study, officer teams containing women were less likely to use force in their response to incidents than teams that had less gender diversity and teams with just racial diversity (Nicholson-Crotty & Li, 2024). One could then surmise that agencies with more female officers would have fewer ARDs. However, other studies have indicated the opposite effect. Using the data on police killings from the Mapping Police Violence database, Deller and Deller (2018) find that higher proportions of female officers within agencies were associated with a greater likelihood of ARDs. They attribute this finding to female officers being more aggressive in interactions to fit in more with their male colleagues (Deller & Deller, 2018). Additionally, Smith (2003) found that agencies with a larger proportion of female officers were associated with higher rates of police-involved homicides but only in smaller cities. Similar to Deller and Deller's (2018) rationale, Smith (2003) suggested these findings may be caused by a threshold effect, whereby agencies that had a somewhat higher proportion of female officers but still not a large share (as might be the case in large cities) would find female officers engaging in use of force to fit in with their perception of the male-dominated culture. This is contrary to agencies in which the share of female officers may potentially be large enough to shift the culture of the department where use of force, and therefore officer-involved killings, are less common (Skolnick & Fyfe, 1993). There is some evidence to suggest there may be a threshold effect of female officer representation. Carmichael and Kent's (2015) analysis of nearly 40 cities in Canada found that the percentage of female officers in a city was related to fewer OISs. Importantly, they also found a threshold effect where at lower levels of female officers, there was a null association with OISs, but the expected count of OISs decreased exponentially at higher levels of female officers (Carmichael & Kent, 2015). The secondary analysis presented in this report showed that in large agencies, the percentage of female personnel was not associated with changes in ARDs over time; however, only a linear relationship was tested. Additionally, the secondary analysis in this report and the studies highlighted in this section were conducted at different levels of analysis (individual, agency level), which may explain some of the divergent findings. Additional research further exploring the relationship, including potential threshold or nonlinear effects, between gender and ARDs should be examined, particularly at the agency level.

Racial and Ethnic Diversity

There is mixed evidence on whether the racial and ethnic makeup of law enforcement agencies can reduce officer use of force and ultimately ARDs. As noted previously, this mixed evidence may be in part due to variations in research design, level of analysis examined (e.g., individual officer demographics vs. agency makeup), and outcome measure (e.g., use of force vs. officer-involved shooting) among other factors. Some research finds support for improving the racial

congruence between law enforcement agencies and the communities they serve in reducing use of force. Gaston et al. (2021) found that the more the racial/ethnic composition of a police force matches that of the community they serve, the less likely they are to use lethal force against Black and Hispanic civilians. This supports Wu's (2021) argument that the race of police leadership makes a difference. Specifically, Wu (2021) analyzed fatal shootings from T*he Washington Post*'s Fatal Force Database and examined the race of the city's police chief, finding that rates of fatal shootings by officers are almost 50% higher in cities with police chiefs who are White than in cities with Black police chiefs when controlling for a number of city characteristics. Ba et al. (2021) also found in their analysis of police stops in Chicago that Black and Hispanic officers are much less likely to use force against civilians, particularly Black individuals, than White officers. Using individual-level data from Indianapolis and Dallas, Wright and Headley (2020) also found that officers are much more likely to use force when there is racial incongruence in the interaction. Moreover, Hoekstra and Sloan (2022) found that White officers use force 60% more than Black officers and are involved in OISs twice as often, particularly when dispatched to neighborhoods with a large proportion of Black residents.

In the secondary analysis described in the first section of this report, we examined agency-level racial and ethnic makeup and its association with ARDs, finding somewhat divergent results from that noted in the literature. In particular, we found in the cross-sectional analyses that agencies in the highest percentile of White officers were associated with fewer ARDs and that over three time points, agency racial and ethnic makeup did not have any relationship with changes in ARDs for large agencies. Although some research has found that Black officers are more likely to shoot at civilians (Johnson et al., 2019; Ridgeway, 2016; Wheeler et al., 2017), more research needs to be conducted to explore the association between agency racial makeup and ARDs. Similar to some scholars' findings for agency share of female officers (Carmichael & Kent, 2015; Smith, 2003), it could be that agency racial composition has a nonlinear or threshold effect on ARDs. This possibility should be explored in future research untangling the impact of agencies' racial and ethnic makeup on ARDs.

Education Level

Research has shown that officers who have a college education are less likely to use force than less educated officers (Aamodt, 2004; McElvain & Kposowa, 2008; Paoline & Terrill, 2007). Although not focused on college education specifically, other research has found that officers in Philadelphia with more *years* of education were less likely to have been involved in a police shooting (Donner et al., 2017). In general, some research notes that college education improves officer ability to handle complicated work tasks (Telep, 2011). One study examining the association between agency requirements for a college degree and ARDs measured from Fatal Encounters found that law enforcement agencies that required a college degree were associated with 110% fewer ARDs of Black individuals than agencies that did not require a college degree (Johnson et al., 2022). However, there was no appreciable association with the ARDs of White individuals. Importantly, Johnson et al. (2022) replicated their analysis using race-specific arrests as the denominator of ARDs, finding essentially the same result; agencies

that required a college degree were associated with nearly 110% fewer ARDs of Black individuals per 100,000 arrests of Black individuals. Again, there was no discernible effect noted for ARDs of White individuals. Though not testing ARDs specifically, Shjarback and White (2016) examined data from the 2003 LEMAS survey to assess whether certain professionalism standards of agencies were associated with citizen complaints against officers, an indicator of agency use of force. They found that agencies that required at least an associate's degree were associated with significantly lower rates of citizen complaints (Shjarback & White, 2016). Analyzing the impact of college education on three police behaviors (i.e., arrest, search, and use of force), Rydberg and Terrill (2010) found that while college education had a null impact on the likelihood of arrest or search, it significantly reduced the likelihood of use of force. In the secondary analysis detailed in the first section of this report, agencies with lower levels of minimum educational requirements were associated with higher rates of ARDs compared with agencies that required a 4-year degree, although these relationships were not significant. Despite this finding, it appears that the research collectively suggests there are protective effects associated with agency adoption of higher education requirements for new recruits. Specifically, the results discussed here suggest agency policies requiring officers to have an associate's degree at minimum. California has taken this a step forward and is currently building a modern policing degree that will be required of all their peace officers (California Community Colleges, 2022).

Officer Training

Many jurisdictions have assigned trainings designed to reduce deaths of civilians during interactions with law enforcement officers. The various types of trainings officers can attend include those focused on racial biases and de-escalation trainings, shooting simulations, procedural justice training, and other general trainings focused on improving decision-making. The research literature shows that training designed to improve officer decision-making, reduce implicit bias and enhance procedural justice and other "soft skills" may impact use of force. The type of training officers receive makes a difference. An examination of police training conducted by the PERF found that training for both new recruits and active officers is more heavily geared toward hard skills like firearm usage rather than soft skills, such as effective communication, de-escalation, and crisis intervention training (PERF, 2015). Similarly, very little training at the academy level is aimed at responding to situations involving individuals with mental illness or disability (Cohen & Bagwell, 2023).

Training to Improve Decision-Making

Although some research was identified that evaluated specific trainings to improve officer decision-making, we also discuss research on the important correlates of officer decision-making in deadly force scenarios in this section.

Most OISs happen within 60 seconds of an officer arriving at a scene (Mora et al., 2023). What happens prior to and during that time that leads to an officer's decision to discharge their weapon? Binder and Scharf (1980) and Scharf and Binder (1983) identified a decision-making

model for police officers' decision to shoot or not shoot in citizen encounters. Their model suggests four temporal phases: anticipation, entry, information exchange, and final frame. Anticipation is when the officers learn of the situation. Entry begins when the officer arrives on the scene. Information exchange is when officers gather information from other officers or citizens at the scene. Binder and Scharf note that some officers may skip this step altogether and go straight to the final frame, which is the point at which an officer decides to use deadly force or not. Pickering and Klinger (2023) use Binder and Scharf's model to analyze a set of interviews with officers who had been directly involved in incidents where an officer intentionally discharged a lethal round at a citizen and multiple officers were present at the scene. The interviewees fell into one of two categories, those who discharged their weapon and those who did not. They found that the presence of other officers on scene impacts officers' actions regarding firing their weapon (Pickering & Klinger, 2023). Officers who did not shoot often did so because they believed their fellow officers had a better shot, the situation had already been resolved by another officer, or several other reasons. They also found that social roles impacted an officer's decision to shoot. For example, higher ranking officers may perceive themselves to be overseers and not in the role of firing their gun, or officers may have assigned positions and duties in specific scenarios where using lethal force would be a consideration for them. About one-third of the officers interviewed either shot or withheld gunfire without any prior conscious thought put into shooting or not shooting (Pickering & Klinger, 2023).

Cook et al. (2022) looked at situational characteristics that impacted an officer's decision-making in deadly force scenarios. They recruited 39 police officers and put them in an immersive training environment during which they were presented with 12 different scenarios. Half of the scenarios presented to the respondents were those that required deadly force while half did not. The scenarios were randomized and then presented to all respondents in the same order. The authors assessed each officer's performance, where the possible outcomes for each of the 12 scenarios included pass, missing the target, being shot by the suspect first, shooting a victim (i.e., a bystander or hostage), and shooting too soon. Cook et al. (2022) found that of the scenarios requiring deadly force, the most common outcome was "pass" (45%), followed by "suspect shot first" (29.6%), then "missed target" (13%). They also found that 9% of the time the officers shot too soon. Analyzing the respondents' self-reported situational factors that influenced their decision to shoot, Cook et al. (2022) found that the decision to shoot was informed by cues from the suspect, such as the suspect being aggressive, non-compliant, or threatening and by the environment, such as whether bystanders or other suspects were present. This research supports what Phillips and Kim (2021) found in their examination of the individual, situational, and neighborhood determinants of officer decision to use deadly force. Using data on OIS incidents (including fatal, non-fatal, and misses) from the Dallas Police Department, Phillips and Kim (2021) found that citizen race or ethnicity and gender were not significant determinants of OISs. Overall, situational factors, such as citizen gun possession, prior commands given by the officer, or officer injury were more important in the decision to shoot than demographic or neighborhood factors (Phillips & Kim, 2021). Additionally, research

analyzing body-worn camera footage suggests that officers are more likely to use lethal force in response to physical threats as opposed to verbal threats from subjects with whom they are interacting (Longridge et al., 2023).

Andersen and Gustafsberg (2016) conducted a randomized controlled trial (RCT) testing a program that trained officers on the physiology of stress, how to manage energy, and other factors that affect their job performance with the goal of reducing fatal police encounters. They found that officers who were trained in this "resilience" program performed better in critical incident scenarios and in making more correct decisions during shoot/no-shoot scenarios compared with a control group (Andersen & Gustafsberg, 2016). A systematic review of police resilience interventions and trainings similarly found these practices were generally related to improvements in outcomes such as officer stress levels and decision-making (Moreno et al., 2024).

De-escalation Training

Both the DOJ and the *Consensus Policy*, along with the President's Task Force on 21st Century Policing (2015), recommend periodic de-escalation training as a key component to reducing police officer use of force. National attention on police use of force has pushed officers to use their de-escalation training and awareness in unarmed confrontations (U.S. Commission on Civil Rights, 2018). Although there is no uniformly agreed upon definition of de-escalation (Todak & James, 2018), Engel et al. (2020b) describe de-escalation as a "process or tactics used to prevent, reduce, or manage behaviors associated with conflict, including verbal or physical agitation, aggression, violence or similar behaviors, during an interaction between two or more individuals" (p. 724) based on their systematic review of the literature. De-escalation training can also vary, with some trainings including de-escalation techniques as part of a broader training and some offering de-escalation training on its own (Engel et al., 2020b).

Through their systematic review on whether de-escalation training works, Engel and colleagues (2020b) found 64 evaluations that were eligible for inclusion, yet they cautioned that only three of these studies were methodologically rigorous enough to draw conclusions from the outcomes. Studies were somewhat mixed on the impact of de-escalation training on subsequent violent incidents. Specifically, violent incidents tended to decrease after training in more than half of all studies (n = 11, 52.4%), while the other evaluations were associated with an increase (n = 6, 28.6%) or no change (n = 4, 19%; Engel et al., 2020b). Engel and colleagues (2020b) conclude that the evidence suggests de-escalation training is associated with "slight-to-moderate individual and organizational improvements" (p. 721). More recent research not included in their review also suggests that de-escalation training may be beneficial in reducing officer use of force.

For instance, one study found that while de-escalation training implemented in Camden, NJ, had no effect on individual officers' use of serious force, a synthetic control analysis of the whole department found a 40% reduction in serious force events as a result of the training (Goh, 2021). Goh claims that contamination between the trained and untrained officers may

have been responsible for the null findings at the individual level. White and colleagues (2021) also used an RCT to test a de-escalation training program implemented with the Tempe Police Department (AZ). The curriculum for the training was developed through a multistage process that included observations of the police department's nominated "top de-escalators" soliciting feedback from officers taking other training courses and soliciting perspectives from officers via a survey. Examining a range of data, including use of force administrative data and body-worn camera footage of use of force incidents, they found that post-training, individuals were nearly 60% less likely to sustain an injury during a use of force encounter with Tempe officers who had the training (White et al., 2021). Similarly, an evaluation of a de-escalation training program (ICAT) implemented in the Louisville Metro Police Department also found evidence of reduced use of force incidents post-training (Engel et al., 2020a). Using a multimethod evaluation design, the evaluators measured the impact of the training on perceptions and self-reported experiences and actual police behaviors. They found that after the de-escalation training was implemented, the number of use of force incidents decreased by 28% in the post-implementation period (Engel et al., 2020a).

Contrary to these studies above, a study by Wolfe et al. (2020) evaluated the impact of a de-escalation and procedural justice training, Tact, Tactics and Trust (T3) through RCTs in two police departments. They found that while the training program translated to more positive attitudes among officers towards procedural justice, they did not detect any change in use of force incidents following the training (McLean et al., 2020). The somewhat mixed impacts of de-escalation training on attitudes and perceptions as opposed to actual behaviors is something that was highlighted by Engel et al. (2020a).

Several other trainings have been evaluated with respect to officer behavior in general and use of force in particular. One unique type of officer-involved deaths is suicide by cop (SBC). SBC refers to a phenomenon in which individuals intentionally exhibit life-threatening behaviors to coerce law enforcement to use deadly force against them (Patton & Fremouw, 2016). Between 33%–57% of all OISs between 2011 and 2020 can be labeled as SBC (Mora et al., 2023). Mohandie and Meloy (2010) show that SBC-related individuals were more likely to be killed during their interaction than other people who were shot by police. Sarno and Van Hasselt (2014) note that during SBC scenarios, buying time for proper negotiation teams to arrive on scene is key to successfully de-escalating the situation. According to the authors, longer interaction times between the individual and the officer can reduce the likelihood of subjects dying. However, research shows a large proportion of shootings occur within the first 5 minutes of an officer arriving on scene (Sarno & Van Hasselt, 2014). Because of this fact, the authors suggest that training all street patrol units with crisis intervention training would be useful in situations where officers do not have time to wait for crisis negotiators to de-escalate the situation.

Procedural Justice Training

More research has looked at the impacts of procedural justice training on use of force. Wood and colleagues (2020a) studied the implementation of procedural justice training to Chicago Police Department officers. The training involved adopting behaviors that propped up the four pillars of procedural justice, which include (1) maintaining impartiality in decision-making, (2) treating people with dignity and respect, (3) giving people a voice, and (4) conveying trustworthiness in decision-making (Murphy & Tyler, 2017). They noted that their findings pointed toward evidence of procedural justice training reducing officer use of force but not complaints against officers (Wood et al., 2020a, 2020b). Specifically, the nearly 8,000 trained officers in their sample used force on average 363 times per month in the year prior to the training, which reduced by approximately 70 uses of force per month across the trained officers after receiving the training (Wood et al., 2020b).

In their RCT of Chicago's Quality Interaction Program, Rosenbaum and Lawrence (2017) found that the Quality Interaction Program did not impact self-reported procedural justice attitudes or communication skills, but it was associated with beneficial outcomes in decision-making scenarios. However, another RCT of a procedural justice program implemented with the Seattle Police Department found that officers who were trained in the program were less likely to be involved in use of force incidents (Owens et al., 2018). The authors noted that the procedural justice program being implemented differed from other standard programs in several respects, including the discussion of a "benign" encounter and the officer's thoughts and actions during the encounter, and then the modeling of procedural justice behaviors by supervisors (Owens et al., 2018). An RCT of procedural justice training with police recruits also found some evidence that new recruits who received the training exhibited more behaviors in line with procedural justice as judged by their field training mentors than control recruits (Antrobus et al., 2019). The training curriculum in this study involved teaching recruits principles of procedural justice and practical interpersonal skills.

Implicit Bias Training

Implicit bias training has been suggested by the President's Task Force on 21st Century Policing (2015) as a vehicle to reducing racial disparities in use of force (Engel et al., 2020c). The U.S. Commission on Civil Rights (2018) recommends implicit bias and de-escalation training for officers. Dunham and Peterson (2017) note the need for implicit racial bias training as officers are more likely to use lethal force with a gun on Black individuals than any other race. This can be coupled with diversity training (Hall et al., 2016).

Although implicit bias training is studied in other professions, there is a dearth of research that examines the effects of this kind of training in law enforcement populations specifically and still less research that examines its effects on officer behaviors, such as use of force, as opposed to explicit beliefs or perceptions. Scholars have called for more rigorous evaluations of implicit bias that look at the long-term impacts of this kind of training on outcomes, including officer behaviors such as use of force (Lum et al., 2016). To fill this gap, an RCT was recently conducted

with the New York Police Department to evaluate the impact of implicit bias training on various outcomes related to officers' attitudes and behaviors. Results of the analyses suggested that implicit bias training did not demonstrate any reduced disparities in use of force (Worden et al., 2020). Rather, the researchers found that after training, there was a significant increase in counts of use of force against Black suspects, which increased disparities in use of force. Similarly, prior to a change in city policy on marijuana, there was a statistically significant increase in counts of use of force against Hispanic suspects during arrest after the implicit bias training was implemented (Worden et al., 2020). Additionally, in a study of 228 law enforcement agencies across the U.S., O'Guinn (2024) found that cultural awareness training was not associated with fatal force at the agency level.

Less Lethal Tactics: Use and Policies

To limit ARDs, weapons such as TASERs, OC spray (i.e., pepper spray), and the physical body are used to promote safety for all involved parties. These weapons are typically chosen to minimize the risks of fatal interactions (i.e., they are safer than firearms) while maximizing an individual's compliance (Sheppard & Welsh, 2022). Roughly 15,000 law enforcement agencies are equipped with less-than-lethal weapons (Alpert et al., 2011; Sheppard & Welsh, 2022).

Some research on less-than-lethal force policies have found that agency policies can reduce use of force, including ARDs. For instance, police departments that have policies for using TASERs experience lowered rates of OISs (Mora et al., 2022). Additionally, in a study of police departments that implemented TASER usage and policies, 56% saw a decrease in their fatal officer-involved incidents (Ariel et al., 2019). In at least one study, departments with the least restrictive policies for TASER use were linked to a reduction in fatal OISs (Ferdik et al., 2014). Where TASER use policies are not as restrictive—that is, officers are not asked to meet or exceed some threshold of subject resistance before pulling their weapon—Kroll et al. (2017) found that fatal OISs are reduced to about 65%. As reported in their systematic review, TASERs are deployed over 300,000 times annually, with only 1 in 3,500 of those deployments leading to an officer-involved fatality (Kroll et al., 2016). When Austin Police Department (TX) adopted TASERs, they saw a decrease in injuries for both officers and community members (Sheppard & Welsh, 2022).

There is a lot of variability among police departments on where they place certain less lethal force tactics on the force continuum: some are more permissive whereas some are more restrictive. Terrill and Paoline (2017) used data from a national multiagency use of force project to explore how agency less-than-lethal policies related to the use of a range of less-than-lethal tactics (e.g., TASERs, OC spray). They examined more than 3,000 use of force incidents in three agencies and found that officers who worked in agencies with more restrictive policies were associated with fewer use of force incidents than those officers working within a more lenient policy framework. Specifically, officers in less restrictive policy environments used on average higher levels of force and a greater amount of cumulative force than those in more restrictive policy environments (Terrill & Paoline, 2017). They also found that when looking at similar

types of encounters, officers in agencies with more permissive TASER policies were more likely to use a TASER than officers in agencies with restrictions against using TASERs in that kind of situation (Terrill & Paoline, 2017).

Other research corroborates the finding that less restrictive agency policies are associated with more uses of force. For example, Morabito and Doerner (1997) analyzed a policy change at the Tallahassee Police Department, finding that when the agency authorized OC spray use in response to verbal or passive resistance as opposed to active physical resistance, officers used OC spray more frequently. In a study of 210 law enforcement agencies, Thomas and colleagues (2010) found that agencies with more restrictive TASER policies had fewer TASER deployments, although they did not find a significant relationship with perceived reductions in lethal use of force. Similarly, Ferdik and colleagues (2014) found that more permissive TASER policy restrictions (i.e., authorizing the use of TASERs on passive resisters vs. combative suspects) is associated with more TASER usage. There may also be differences in the impact of more or less restrictive policies that are contingent on the weapon type (Sheppard & Welsh, 2022). For example, Sheppard and Welsh's (2022) systematic review of the impact of less-than-lethal weapons on use of force found two studies that demonstrated a reduction in harm as a result of making OC spray use less restrictive (Miller, 2008; Womack et al., 2016).

DeGue et al. (2016) suggests that using less lethal forces such as chemical sprays or TASERs has led to a decrease in civilian injuries, and some also suggest that TASER use can prevent lethal force in 5% of cases (Kroll et al., 2017). However, some research indicates that general health issues and pre-existing medical conditions combined with the use of TASERs can lead to death (Zare et al., 2022). Zare and colleagues (2022) suggest that because certain medical conditions are not always visible or apparent, TASER usage on elderly individuals and unarmed individuals should be restricted (Zare et al., 2022). TASER usage also poses a risk of death when used on individuals experiencing excited delirium, a syndrome in which the nervous system causes an extreme fight-or-flight response (Roach et al., 2014). For instance, one study found that in more than 10% of calls for service where excited delirium was present resulted in a fatal police interaction involving a TASER (McGuinness & Lipsedge, 2022). A Reuters investigation conducted in 2017 revealed that as of mid-year 2017, over 1,000 individuals have died after police officers used TASERs on them in the United States alone (Eisler et al., 2017). Reviewing the autopsies for these deaths, Eisler et al. (2017) found that over 100 cases started from a medical emergency call to 911. Furthermore, 153 of those deaths were related to or directly attributed to the use of a TASER, with others indicating various pre-existing conditions led to death.

Situational characteristics may also factor into the lethality of TASER usage. For instance, where an individual is located during the TASER deployment may impact their likelihood of serious injury or death. Kroll et al. (2016) recommend officers should not deploy their TASERs at targets if the individual is on an elevated surface, running, or on a moving object such as a bicycle to minimize injuries as individuals fall. Although some subjects can recover from higher falls, there

is an increased fatality rate for older individuals hitting their heads after falling from TASER use. Additionally, multiple case studies have indicated that fuel can ignite with the deployment of a TASER (Kroll et al., 2017). A subject's weight, violence level, distance from the officer, and drug and alcohol use also play a key role in the effectiveness and subsequent injury level resulting from TASER usage (Ariel et al., 2019). For other less-than-lethal weapons, such as kinetic impact projectiles (rubber or plastic bullets or bean bag rounds), at least one systematic review of 26 articles published between 1990 and 2017 found that the use of such weapons (often for crowd control) was associated with significant injury and sometimes death (Haar et al., 2017). Specifically, they found that of the 53 deaths and 300 individuals suffering from permanent disabilities identified across these 26 studies, 49% and 83% respectively were caused by strikes to the head and neck (Haar et al., 2017). The authors conclude that the inherent inaccuracy of these weapons and their serious risk for disability and death call into question their appropriateness for crowd control settings, but they do not discuss general encounters (Haar et al., 2017).

Understanding the relationship between less-than-lethal technologies and ARDs is complicated by the fact that we cannot know what would have happened had agencies not deployed these technologies (i.e., the counterfactual). Specifically, it is possible that less-than-lethal weapons increase, decrease, or have a null association with ARDs. If individuals who die from less-than-lethal weapon usage would not have otherwise died because the situation would not have risen to the level of precipitating lethal force, less-than-lethal weapons usage would increase the ARD count. Alternatively, if officers use lethal force against individuals because there are no alternative uses of force available to them, less-than-lethal weapons usage would decrease the ARD count. Finally, it is possible that there is no effect of less-than-lethal weapons usage on ARDs. Adequately isolating the effect of less-than-lethal weapons on ARDs requires accounting for some of these issues.

Physical Restraint

Law enforcement use a variety of physical restraint techniques, including handcuffs, chokeholds, airway restrictions, and carotid holds. Most people use the term "chokehold" to refer to or describe any kind of neck hold or restraint. However, there are generally two types of neck restraints: vascular neck restraints (VNRs) and chokeholds (Office of Police Oversight, 2021).

A VNR, or carotid neck restraint, is a technique that applies pressure to the lateral neck vasculature and may cause temporary unconsciousness. A VNR is different from a chokehold or other neck manipulations that restrict breathing. Some agencies allow the use of VNR while others have banned it. In a study by Bozeman et al. (2022), over 85,000 officers and trainees from the San Diego Police Department, the North Carolina State Highway Patrol, and the Royal Canadian Mounted Police received training on VNR use. A total of 944 field VNR applications were performed over an 11-year period by these agencies while apprehending combative or resistant subjects. A review of the VNR applications revealed that the technique was successful

in allowing apprehension of an individual in nearly 93% of instances. There were no fatalities or serious injuries related to VNR, and only 24% of uses resulted in the subject being rendered unconscious. Bozeman et al. (2022) clarify that "These findings do not exclude the possibility of a rare serious complication or guarantee safety if the technique is not applied correctly, but the likelihood of these events appears very low. Importantly, case reports have identified strokes and vascular injuries occurring after VNR or similar maneuvers in martial arts, often with delayed presentations." Similarly to Bozeman et al.'s (2022) results, findings from a review of data on the use of neck restraints by the Spokane Police Department, in which neck restraint was used 230 times during an 8-year period, found it yielded a lower rate of injury to subjects but a higher rate of injury to officers and resulted in no subject fatalities (Hickman, 2021).

Chokeholds, different from VNR, have been found to cause injury and death. Richardson et al. (2021) reviewed autopsy data from 29 deaths related to law enforcement chokeholds. They found that chokeholds can be associated with death and severe injury to the cardiovascular and central nervous systems. In addition, restraining individuals in a prone position (i.e., on their stomach) has also been identified as having the potential to cause serious medical issues, such as metabolic acidosis, among overweight individuals (Weedn et al., 2022). In 2020 in Rochester, New York, Daniel Prude died after Rochester Police restrained him in a prone position, handcuffed his hands behind his back, and held his head down on the pavement. The Medical Examiner ruled that he died from "complications of asphyxia in the setting of physical restraint" with PCP use as a contributing factor (Police1, 2022).

Some state legislatures and police departments have also been reviewing the technique of restraining individuals in the prone position. For example, in September 2021, California passed legislation that prohibits police from using techniques that reduce the ability to breathe and creates a substantial risk of "positional asphyxia." This includes putting an individual face down, then pressing down with their body weight on their neck, torso, or back with hands, elbows or knees to gain control (Thompson, 2021).

Although restraint techniques help law enforcement subdue individuals, with recent high-profile deaths in custody such as Eric Garner, chokeholds and other types of neck restraints have been identified as methods that lead to unnecessary injury and death. In recent years, many law enforcement agencies have changed or updated their policies on the use of neck restraints and holds, either banning them or clarifying that their use is only allowed in situations in which deadly force is authorized, which is in line with recommendations from medical, policy, and advocacy groups (Beck et al., 2024; Cahill et al., 2022; Kaur & Mack, 2020; Prior, 2021; U.S. Commission on Civil Rights, 2018).

Summary of Agency Policies and Practices and ARDs

Some research has focused on the utility of law enforcement policies and practices in reducing police use of force or ARDs. Research studies have varied in their settings, populations, and methodological rigor. Some studies have examined how various policies on use of force as well

as those that would relate to officer characteristics are associated with ARDs. Agencies vary in their use of force policies. Some research suggests that limiting the scenarios in which deadly force is allowable is associated with fewer OISs. Research is generally mixed on officer or agency factors such as gender or race and their influence on ARDs, which may partly be a function of the different methodologies and measures used to answer these questions. Some practices that have been examined include trainings, such as those focused on improving officer decision-making, de-escalation in critical incidents, procedural justice training, and implicit bias training. Based on the literature uncovered through this scan, there is evidence that some trainings, such as de-escalation trainings and procedural justice training, may be useful in reducing use of force, injury, and potentially ARDs. Research on agency policies related to use of force mostly suggest that policies surrounding less-than-lethal technologies impact officer behavior in the field and thus may impact the likelihood of ARDs. Some research shows that having policies on TASER usage is associated with fewer ARDs; however, the research on the impact of the restrictiveness of TASER policies is less clear-cut. Ultimately, there is still a relative dearth of high-quality evaluations on how agency policy and less-than-lethal weapon use affect use of force behaviors and ultimately ARDs (McLean et al., 2022). Different physical restraints have also been examined in the literature, with research finding that certain types of restraints, such as chokeholds, are associated with greater injury and death.

Reduction or Improvement of Law Enforcement–Citizen Interactions

In addition to policies designed to reduce the need for use of force and by consequence ARDs, other measures designed in part to reduce or improve the way in which officers interact with the public have been advanced by many departments.

Alternative Response Models: Co-response and Community Intervention Teams

Co-response teams are typically made up of law enforcement members trained in harm reduction methods combined with mental health professionals (IACP, 2020). Co-response programs are heavily focused on making connections to services while limiting law enforcement involvement (Julota, n.d.). The definition and application of co-response teams varies by city as communities look to tailor responses based on their specific needs. The limited research that is available indicates that the co-responder teams lower the time officers spend on calls and increase connection to services. The Poulsbo Police Department (WA) integrated behavioral health navigators from the Poulsbo Behavioral Health Outreach Program (IACP, 2020) into their co-response teams. If officers came into contact with a person in need, they could request a navigator to assist in finding services or treatment for the individual. In 2020, Colorado expanded its co-responder program to reach a total of 26 Office of Behavioral Health–funded programs. In an evaluation of eight of the existing programs, about 40% indicated they always or often diverted individuals from mental health holds (Colorado Health Institute, 2020).

The Durham, NC, Community Safety Department deploys multiple response teams in their community. Their co-response team partners clinicians with Durham's Crisis Intervention Team

(CIT)-trained police officers, focused on tailoring responses to crisis calls and increasing safety for all involved parties (City of Durham, n.d.). Currently, less than 5% of cases are redirected to law enforcement response; over 70% of incidents are resolved through the co-response model. Houston, TX, also uses a co-response model, including a CIT officer partnered with a licensed clinician (Houston Police Department, n.d.). Together, they share a patrol vehicle to respond to calls related to mental health crises. They assist and lead CIT-based calls, follow up with CIT incidents, and work proactively in the community.

Crisis intervention teams interact with at-risk community members to help guide them toward services while limiting further negative interactions with law enforcement (DeGue et al., 2016). CIT practices reduce officer use of force through de-escalation training coupled with an intentional focus on safety and connection to services (Boddy et al., 2024; Julota, n.d.; Willis et al., 2023). One of the most popular alternative response programs, CAHOOTS (Crisis Assistance Helping Out On The Streets), is centered on reducing law enforcement–related incidents of violence or death (Shadravan et al., 2021). This type of alternative response model differs from the CIT approach in that it does not involve law enforcement from the crisis response. Alternatively, each CAHOOTS team is made up of a medic and a crisis worker who provide support in medical or psychological crisis (White Bird Clinic, n.d.). Evaluations of these teams are very limited, and current data are limited in demonstrating the effectiveness in reducing use of force involving race and mental health issues (Shadravan et al., 2021).

Militarization of Police Weapons and Tactics

There are some researchers who suggest a correlation between OISs and the militarization of police departments. Over the second half of the 20th century, police departments have become more militarized (Meeks, 2006). Lawson (2019) purports there are two mechanisms for this, the first being the hierarchical structure of police and elected officials when discussing law enforcement matters like the discussion of police forces fighting “wars,” such as the war on drugs. Additionally, because of how police departments run, newer recruits take cues from their leaders and veteran officers. The second mechanism is operational—for example, the intermingling of military and police forces. There has been increased involvement between military and police forces, including participation in the federal 1033 program, which provides surplus military equipment to law enforcement agencies. Delehanty et al. (2017) found in their study of four states that agencies in counties receiving a higher value of 1033 transfers in the prior year were associated with more ARDs. Koslicki et al. (2021) found a moderate positive relationship between the number of military items obtained from the 1033 program and fatal force; however, that relationship disappears when they disaggregated the police agencies by size.

Summary of Measures to Reduce or Improve Law Enforcement–Citizen Interactions and ARDs

Some jurisdictions are implementing alternative response models that are designed to limit the interactions between law enforcement and at-risk populations, such as individuals in a mental

health crisis. These programs are intended to divert individuals from a criminal justice response, which could potentially result in use of force or ARD. Although there is some research demonstrating that these programs can divert individuals into needed services, there is currently limited research that evaluates whether these programs reduce or prevent ARDs. More research needs to be conducted on the variety of alternative response models that are being implemented to understand whether and what elements of these different models are effective at reducing and preventing ARDs. In addition to alternative response, some limited research has explored whether more militarization of law enforcement is associated with more ARDs. Research examining the receipt of equipment through the 1033 program has yielded somewhat mixed results. More research needs to be conducted to understand the role of these programs and ARDs.

Accountability and Oversight

Body-worn Cameras

Body-worn cameras have been touted as one accountability measure that police can adopt to reduce use of force and enhance accountability (Engel et al., 2020c). Body-worn cameras help officers' self-awareness, creating more intentional actions, and increase officer accountability while addressing misconduct (Hall et al., 2016). Recordings from body-worn cameras can also assist police agencies with identifying positive interactions with the community and highlight problematic areas where officers are utilizing excessive force (Gullion et al., 2023). Theoretically, body-worn cameras are thought to have a civilizing effect on encounters between officers and citizens, thus reducing the likelihood of use of force and ultimately fatal force. However, the evidence suggests that the impact of body-worn cameras is mixed. Some studies have found that body-worn cameras are associated with reduced use of force by officers who use them. After the Mesa (AZ) Police Department implemented their body-worn cameras, they received 3 times fewer complaints against officers with body-worn cameras than those without cameras within the first year (Miller et al., 2014). In a larger review of 16 studies, the effect of body-worn cameras on use of force was somewhat mixed (Lum et al., 2019). In some of the studies included in the review, officers with body-worn cameras used significantly less force than officers not equipped with cameras, while in other studies, there was no significant difference between these two groups (Lum et al., 2019). Furthermore, an analysis of differences in police-involved homicides before and after the implementation of body-worn cameras showed no effect across 261 cities (Ali & Wright, 2024).

Ariel and colleagues' (2016) analysis of 10 RCTs on body-worn cameras found that differences in *how* officers used body-worn cameras may be driving these mixed findings. For instance, they found that when officers were given discretion on when they could turn their cameras on, they used more force than officers who did not have as much discretion in turning on their cameras. Similarly, Goh's (2020) analysis on the effects of body-worn camera policies on OISs in 36 large police departments across the United States found that body-worn camera coverage

did not translate to changes in OISs, yet agency policy that restricted officer discretion on usage decreased shootings by 33%.

Oversight Committees

Another mechanism that some police departments use to enhance accountability, improve police–citizen relationships, and ultimately reduce officer-involved deaths, are civilian review boards or oversight committees (Dunham & Petersen, 2017; Engel et al.,2020c). According to the National Association for Civilian Oversight of Law Enforcement (NACOLE), these committees can be categorized as primarily (1) review-focused, (2) investigation-focused, and (3) auditor/monitor–focused models (Vitoroulis et al., 2021). The Office of Community Oriented Policing Services and NACOLE produced a report on the key principles and practices for the effectiveness and sustainability of civilian oversight models, citing "independence, clearly defined and adequate jurisdiction and authority, unfettered access to records and facilities, as well as access to law enforcement executives and internal affairs staff" as some of the key principles that make oversight boards effective (Vitoroulis et al., 2021, p. 13). According to Lum and colleagues (2016); however, the evidence for oversight committees is limited. The evidence that does exist is mixed, though most studies of oversight committees or civilian review boards focus on citizen complaints as the outcome of interest and not necessarily on incidents of fatal force or use of force more generally (Engel et al., 2020c). At least one study has found that agencies with a civilian review board were more likely to report at least one OIS of an unarmed person (O'Guinn, 2024). The same study found that agencies with an external review of deadly force were much less likely to report any OISs of unarmed Black individuals. Though more research is needed on this topic, future evaluations of oversight committees are likely to be complicated by the extreme variability across oversight committees in various locales because these systems are highly tailored to the specific jurisdiction in which they operate (Vitoroulis et al., 2021).

Early Intervention Systems

Evidence shows that there is a positive association between police officers who have prior police misconduct or citizen complaints against them and OISs (Mora et al., 2023). In other words, knowledge of officers' complaint histories and misconduct may provide an opportunity for agencies to intervene to prevent future uses of force. This is the logic underlying early intervention systems (EISs), which are often put in place by law enforcement to identify issues at the individual and organizational levels before a use of force or police-involved fatality occurs (Walker, 2015). These systems are believed to provide a proactive means of identifying not only the small proportion of officers who are responsible for most officer misconduct but also broader issues within a department (Dunham & Petersen, 2017; Walker, 2015). EISs are considered a "best practice" to prevent officer use of force by some (Harmon, 2009) and typically consist of four components, including "performance indicators, procedures for officer identification, intervention and postintervention monitoring" (Engel et al., 2020c, p. 157). Despite being labeled a best practice, the evidence on the impact of EISs on use of force is

sparse. There have been few studies of EISs, and the studies that have been completed often lack methodological rigor (Engel et al., 2020c). Worden and colleagues (2018) conducted a review of EIS evaluations, finding evidence that EIS interventions reduce the likelihood of complaints and uses of force. However, the issues with the methodological design in the included studies leave much more to be understood about the effectiveness of these systems. Based on this evidence, Engel and colleagues (2020c) conclude that the evidence of the ability of EISs to reduce police use of force and ARDs more specifically is relatively weak.

Documentation when Force is Used

Mora et al. (2023) found some use of force policies affiliated with a decrease in officer-related shootings, including restrictive policies on use of lethal force (Dunham & Peterson, 2017) and mandated reporting for drawing and pointing firearms. Recent work by Shjarback and colleagues (2021) has found that a change in Dallas Police Department policy requiring officers to report when they point a gun at a subject was associated with a reduction in OISs. Using merged Fatal Encounters data with the LEMAS survey, Jennings and Rubado (2017) similarly found that police agencies that required officers to file a report when they pointed their guns at people (but did not shoot) had significantly fewer OISs.

Duty to Report

Little research that examined whether reporting incidents of use of force translated to fewer ARDs was uncovered. One study showed that police departments that report their use of force had lower rates of lethal force (Dunham & Peterson, 2017). The Dallas Police Department implemented this reporting policy and found that their fatal OISs decreased over time (Cahill et al., 2022). However, it should be noted that self-selection bias could pose a limitation to these positive results.

Duty to Intervene

According to the IACP, peer bystander intervention ("duty to intervene") policies, in conjunction with use of force policies, can help agencies achieve better community relationships and reduce instances of police misconduct and excessive uses of force (IACP, n.d.). Trainings on peer bystander interventions are designed to give officers the confidence to intervene when they believe it is necessary to do so. Because a common inhibitor to intervening is fear of reprisal, the IACP also recommends that agencies implementing peer bystander policies and training also include language in their policy to prohibit retaliation against the bystander. Importantly, they note that peer bystander training cannot be effective in improving relationships with the community and reducing officer uses of force without the support of the organizational culture. If the agency does not value or reward officers who are willing to intervene, personnel will likely not feel empowered to intervene in problematic scenarios. No empirical research that examined duty to intervene was uncovered, meaning this is an area that is open for future research to understand whether "duty to intervene" policies translate to more accountability in police agencies and therefore fewer officer-involved deaths.

Summary of Accountability and Oversight Mechanisms and ARDs

There are a variety of mechanisms that law enforcement or other stakeholders implement to increase accountability among law enforcement agencies. One accountability measure employed by many jurisdictions are body-worn cameras. Based on the research uncovered in the literature scan, it appears that not simply having body-worn cameras but rather *using* body-worn cameras makes a difference in reducing ARDs. Indeed, Engel et al. (2020c) conclude that the current evidence on body-worn cameras suggests that body-worn cameras on their own are not sufficient to reduce use of force but rather require additional factors such as agency policy and procedure to guide the effective use of this technology in order to prevent and reduce use of force. Some agency policies, such as those requiring officers to report when they point their gun at an individual, have been associated with fewer OISs. Other accountability mechanisms, including EIS, police oversight committees, duty to report and duty to intervene policies, have been the subject of very limited research. Ultimately, more research needs to be conducted on the wide variety of accountability mechanisms being implemented to understand their relationship with ARDs.

Recommendations

The recommendations stemming from the environmental scan of the literature are limited by the quality and scope of existing research. In general, more robust research on the full breadth of agency factors, policies, and practices that lend themselves to fewer ARD needs to be conducted. From the existing literature, there are some policies and practices that have been evaluated more and with more rigor than others. We advance the following recommendations based on this body of research.

Recommendation 1. Improve interactions between community members most at risk of ARDs and law enforcement, leveraging alternative response models when appropriate.

As alternative response models become more popular, these models should continue to be evaluated for their effectiveness in reducing interactions between law enforcement and at-risk individuals such as those in mental health crisis and in reducing officer use of force. Preliminary evidence suggests that co-response models may divert individuals with mental illness or experiencing a mental health crisis away from the criminal justice system and into health and social services. When appropriate, leveraging alternative response models that have been deemed effective may reduce and prevent ARDs by limiting the interactions between law enforcement and at-risk individuals during crisis situations and refer individuals into needed services that may prevent future interactions that could result in ARDs.

Recommendation 2. Implement de-escalation training and procedural justice training.

Evidence from several evaluations suggest that certain trainings, such as de-escalation training and procedural justice training, can improve officer behavior and use of force and ultimately reduce ARDs. Although additional rigorous research on de-escalation and procedural justice needs to be conducted in a variety of settings, the evidence from the studies that exist

demonstrate that these trainings may lead to reduced use of force behaviors at the agency level.

Recommendation 3. Continue to assess outcomes related to less-than-lethal uses of force (e.g., TASERs) and physical restraints (e.g., leg hobbles and neck restraints) and adjust policy restrictiveness accordingly.

Some studies find that less-than-lethal weapons are associated with fewer ARDs; however, the policies surrounding the use of such weapons appear to make a difference. The results from the secondary analyses and findings from the environmental scan reveal that agencies with policies in which officers are more restricted in their use of certain force tactics are associated with fewer ARDs than agencies with permissive policies in which all personnel are permitted to use these tactics. However, research also reveals that the success of policy changes may hinge heavily on the support of agency leadership and culture. Agencies should evaluate their own use of force policies with respect to use of force incidents and ARDs. When making policy changes at the agency level, agency leadership should convey their rationale and their support of these policies.

Recommendation 4. Adjust officer recruitment policies to incentivize recruits with higher education experience.

Incentivizing recruits who have higher education experience may benefit agencies. Results of the environmental scan suggest that officer educational experience may reduce the amount of force used by officers, which can also reduce the likelihood of ARDs. In particular, college degrees and more years of education have been linked to less use of force. The secondary analysis conducted in the first section of this report revealed that higher minimum education requirements in a sample of large agencies was associated with fewer ARDs over three time points, but these associations were not statistically significant. However, more research examining the role of higher education requirements suggests that agency policies requiring officers to have an associate's degree at minimum may reduce use of force, and ultimately, ARDs. One example of such a policy is a modern policing degree that will be required of all California peace officers (California Community Colleges, 2022).

Recommendation 5. Conduct more research on the full spectrum of police accountability mechanisms (i.e., oversight commissions, EIS, bystander intervention and duty to report policies) and their association with ARDs and implement those most effective at reducing ARDs in the near and long term.

Research on certain oversight mechanisms, such as oversight committees or citizen review boards, is limited because these models vary tremendously from site to site in their overarching purpose and design. More research needs to be conducted on the effectiveness of these models in reducing fatal officer interactions over time. Additionally, some evidence of EIS suggests these may be positive mechanisms of identifying problematic officers before fatal use of force events occur. However, more research needs to be conducted on these systems to

understand their true impact on ARDs. Other accountability measures, including policies related to bystander intervention and duty to report, are largely absent from the literature. Research on these policies and whether they may reduce fatal officer interactions is also important.

Recommendation 6. Conduct more research on the individual, agency-level, and situational factors that are most associated with ARDs.

Existing research has identified certain demographic groups as more at risk than others of dying during interactions with police. Through this research, and from the results from our secondary analyses of Fatal Encounters data, we find that Black individuals—and increasingly, American Indian and Alaska Native populations—are at an elevated risk of dying during an interaction with law enforcement.

Additionally, relatively young men die at higher rates. More research should be conducted on individual-level factors, including mental illness, housing status, and drug use, that may predict the likelihood of an individual dying during an interaction with law enforcement and why. This understanding can lead to the development of ways to mitigate negative interactions between law enforcement and these populations at greatest risk. Additionally, more research needs to be conducted that examines for disparities using different exposures (i.e., denominators) other than the general population. Agency-level factors, including the demographic makeup of departments, departmental culture and leadership, and the policies and practices implemented by agencies should also be examined further, including over time. With respect to agency demographics in particular, it is important to better understand the relationship between agency racial and ethnic makeup, as well as the congruence of this makeup with the community served, and ARDs.

As noted in the secondary analyses, the overwhelming majority of agencies did not experience any ARDs during the 8-year period examined, and a significant fraction experienced a single death. Because ARDs are rare, it can be difficult to identify agency features that are significantly related to these deaths. Case studies of agencies at both extremes of the distribution (i.e., those who have never experienced an ARD and those who have experienced multiple ARDs) may provide additional insight into agency-level features that are more or less conducive to officer-involved deaths.

Finally, aspects of the incidents that lead up to the ARD should be further explored. The secondary analysis found that most individuals who died during an ARD died of a gunshot wound, and most were armed with a firearm. This implies that widespread gun availability in some places may lend itself to more gun wielding and thus more OISs. Understanding additional situational features can point to other areas in which policies can be directed to limit the scenarios when use of force, particularly lethal force, is perceived as necessary.

Conclusion

Deaths occurring during an interaction with law enforcement are rare, yet the severity and harm of these events are felt by the individuals who die, their family members and communities, and by the law enforcement professionals who are involved in these incidents. This secondary data analysis and environmental scan sought to identify key factors linked to fewer ARDs to inform policies and practices to reduce such deaths. Over the past decade, high-profile police-involved deaths have been on the nation's consciousness and sparked calls for changes to how law enforcement interacts with the public. Unfortunately, the many calls for reform are often unaccompanied by the evidence to back them. Sherman and colleagues (1998) note that "evidence-based policing is the use of the best available research on the outcomes of police work to implement guidelines and evaluate agencies, units, and officers using the best research." However, finding these best practices from the best available research is not an easy feat, and the state of evidence on best practices is ever evolving (Hall et al., 2016). In order to prevent ARDs, police departments across the United States look to promote efficient and effective harm reduction policies. These practices are often applied but have minimal supporting evidence for their use (Engel et al., 2020c). This report highlights the state of the evidence of many policies and practices that are being implemented to reduce use of force and ultimately deaths.

Using Fatal Encounters data, we found that more restrictive use of force policies for certain tactics, such as baton usage, neck restraints, and TASER usage, were associated with fewer ARDs in 2013 and 2016. These findings correspond to some of the literature regarding restrictive agency policies on use of force and officer-involved deaths. Moreover, requiring documentation for different uses of force did not appear to be influential predictors of agency ARD rates. Contrary to what some research has found regarding the protective effect of diverse agencies in terms of race and ethnicity and share of female officers, only the share of White personnel in an agency appeared to matter in predicting ARDs. However, agency demographic makeup had no association with changes in ARDs over time. The secondary data analysis was limited by the LEMAS questionnaire, and so we were unable to assess the potential impact of various trainings on agency ARD rates. From the literature, some types of trainings have received more evaluation and evidentiary support than others. De-escalation training and procedural justice training appear to improve officer behavior and reduce use of force behaviors, but more rigorous research is needed to fully unpack how these trainings and their implementation can reduce ARDs in a variety of agencies and locations. The evidence on the relevance of officer characteristics is somewhat mixed. Officer education appears to be beneficial for reducing use of force, but the evidence on female officers suggests an agency's share of female officers may only have a protective effect when that share is large enough. Furthermore, some accountability measures also show mixed results. Many agencies across the United States have adopted body-worn cameras as a way of increasing accountability and improving community trust. However, the success of body-worn cameras in reducing use of force appears to depend heavily on the organizational policies that accompany them.

Importantly, organization and culture may be important for whether various policies, practices, trainings, and technology lead to reductions in officer use of force behaviors; however, these factors are not readily accessible in surveys. In general, more robust research is needed for all types of policy and practices we discussed to build the evidence on what works to reduce deaths resulting from encounters between law enforcement and the communities they serve.

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Understanding and Reducing Deaths in Custody: Jails

Interim Report

Prepared for

Benjamin Adams, Program Manager
National Institute of Justice
Office of Justice Programs
U.S. Department of Justice

June 2024

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Introduction

Jails in the United States are designed to hold incarcerated individuals for relatively short periods, including individuals who are being detained pending an arraignment, bail hearing, or case disposition and those who have been convicted and sentenced to serve less than 1 year in confinement. There are approximately 2,850 jurisdictions that operate the 3,116 jails in the United States. These facilities are typically operated by local government entity, such as a sheriff's office, a police department, or a city or county administrator. Most jail jurisdictions operate a single jail facility, but some have multiple facilities or multiple operators (e.g., both a county and a private jail facility with a single jail jurisdiction). At mid-year 2019, there were approximately 734,500 individuals detained in U.S. jails (Zeng & Minton, 2021).[1] Most (65.5%) individuals detained in jails were unconvicted; that is, they were being held pending the outcome of a case or charge. The average length of stay for an individual in jail in 2019 was 26 days, and the average jail in the United States experienced 53% turnover each week.

The Bureau of Justice Statistics (BJS) reported that in 2019, 1,200 individuals died in local jails in the United States—a 5% increase from 2018 and a 33% increase from 2000 (Carson, 2021a). The number of jurisdictions reporting at least one jail death in a year has steadily increased over time, from 14.5% of jurisdictions in 2000 to 23% in 2019 (Carson, 2021a). In 2019, suicide was the most common single manner of death[2] occurring in local jails, accounting for approximately 30% of deaths (Carson, 2021b). In 2019, 46% of jail deaths were attributed to natural causes, down from 57% in 2000. In contrast, the proportion of jail deaths caused by drug and alcohol intoxication steadily increased over the same period, from 4% of all jail deaths in 2000 to 15% in 2019. In 2019, approximately 75% of individuals who died in jails were not convicted of a crime at the time of their death and almost 40% had been held for a week or less.

Jail administrators are charged with providing a secure environment that ensures the safety of confined individuals and must address the multifaceted needs of a population that is constantly turning over. Jail facilities may be overcrowded, understaffed, and underfunded. The number of individuals that jails handle each year is significant. In 2019, jails reported having over 10 million admissions (Zeng & Minton, 2021). Incarcerated individuals are generally in the custody of jails for a short period, but this window may pose health risks because these individuals may be

[1] The most recent statistics available on jail populations are from mid-year 2020. Mid-year 2019 statistics are presented here as more reflective of historical trends in jail population data. The COVID-19 pandemic in 2020 led to the enactment of early release policies for jails across the United States, and at mid-year 2020, the U.S. jail population was 549,100, representing a 25% decrease from mid-year 2019. From 2010 through 2019, the U.S. jail population ranged from a low of 727,400 in 2015 to a high of 748,700 in 2010.

[2] Deaths are classified by both manner and cause, with the cause being the underlying illness or injury that led to the death and the manner being the determination of how that illness or injury led to the death. Manner of death is classified as occurring naturally, by accident, by suicide, by homicide, or undetermined.

under heightened stress, dependent on or withdrawing from illicit substances, or experiencing mental health or other medical needs that may or may not be diagnosed or treated.

To gain a better picture of the context and policies related to deaths in jail custody, RTI International conducted a two-phased analysis and review of the existing data and literature. Using data from the BJS Mortality in Jails series extending from 2000–2019, the most recent year available, RTI analyzed the prevalence of jail deaths, individual and facility characteristics, and circumstances associated with these deaths in custody. Concurrently, RTI conducted an environmental scan of the scientific and grey literature and current policies regarding deaths in jail custody.

This study is part of the National Institute of Justice (NIJ) Deaths in Custody Reporting Act (DCRA) Study, which is designed to generate significant advances in the knowledge and understanding of deaths in custody and to result in recommendations that support efforts to prevent and reduce such deaths. The DCRA Study is conducted pursuant to the 2014 reauthorization of the Death in Custody Reporting Act (DCRA 2013),[3] which requires the Attorney General to conduct a study and submit a report to Congress to "(A) determine means by which such information can be used to reduce the number of such deaths, and (B) examine the relationship, if any, between the number of such deaths and the actions of management of such jails, prisons, and other specified facilities relating to such deaths" (see 34 U.S.C. § 60105 (f)(1)(A) & (B)).

DCRA 2013 further requires states to document and report the death of any person being held in custody by law enforcement, jails, or prisons. The Act defines "in custody" as any person who is detained, under arrest, in the process of being arrested, or enroute to being incarcerated or those who are incarcerated at a municipal or county jail, state prison, state-run boot camp prison, boot camp prison that is operated by the state, any state or local contract facility, or other local or state correction facility (BJA, 2022a).

This report describes the prevalence and characteristics of deaths that occur in jails and a description of the policies and practices designed to reduce such deaths. Separate environmental scans examine deaths occurring in law enforcement custody and in prison settings. All DCRA Study activities are organized by the three main contexts in which deaths in custody occur: law enforcement custody, jails, and prisons. Each of these contexts present distinct prevalence rates; causes and manners of death; and situational factors that demand different practices, policies, and strategies to reduce these deaths. Law enforcement officers engage community residents in an open environment whereas jails and prisons are highly regulated, closed environments. For example, the acute and often unpredictable nature of law enforcement interactions necessitates critical decision-making around the use of force. The

[3] The Death in Custody Reporting Act was first passed in 2000 (P.L. 106-297) and required the collection of individual data on deaths in the process of arrest, local jails, and state prisons. DCRA 2013 was reauthorized in December 2014.

trauma of jail detention, particularly immediately after booking and pre-trial, and the high prevalence of mental illness among incarcerated individuals requires attention to the risk of suicide in jail settings. In prisons, individuals often have serious incoming health issues and can spend years or decades incarcerated—a situation exacerbated by the aging U.S. prison population.

Methodology

This report explores the prevalence and correlates of mortality in local jails and describes selected management practices and policies that may be associated with or are designed to reduce these deaths. RTI conducted a secondary analysis of existing mortality data and an environmental scan of the literature.

Using data from the BJS Mortality in Jails series extending from 2000–2019, the most recent year available, RTI analyzed the prevalence, individual and facility characteristics, and circumstances associated with jail deaths in custody. Data from each death were then linked to the jail jurisdictions and facility where the individual was being held using the Census of Jails (COJ; 2006, 2013, 2019). Next, these data were linked to the counties where the decedent and jail facilities were located using the American Community Survey (2009–2019). The secondary analysis does not examine DCRA data collected by the Bureau of Justice Assistance (BJA). Department of Justice reports have shown that these data are incomplete in their coverage, with variation in how agencies and states are reporting these data and in many cases suffer from data quality issues such as missing key data elements (DOJ, 2022; 2023).[4] The primary research questions include the following:

1. How many people die each year in U.S. jails?
2. Who dies in jail?
3. What are the manners and causes of these deaths?
4. Under what circumstances do people die?
5. What types of facilities are associated with these deaths?
6. Are community characteristics associated with these deaths?

To address these questions, RTI performed descriptive, cross-sectional, and longitudinal statistical analyses. The following shows the number, mortality rate (per 100,000 incarcerated individuals), and percent change of deaths by selected characteristics. The number of deaths describes the size of the problem, relative differences between groups, and trends over time. The mortality rate accounts for the size of the population and captures differences between groups and change over time. A multivariable analytical model was performed to examine the relationships between facility and community characteristics focusing on potential risk factors and practices associated with the manner of deaths. Answers to these questions can point to potential populations, places, and practices most at risk for a death in custody case.

[4] The final research report produced under this study will include a discussion of the quality, coverage, and completeness by sector (i.e., law enforcement, jails, prisons) of data collected through the DCRA program by BJA and, to the extent possible, these data will be incorporated into analyses, conclusions, and recommendations.

Furthermore, examining change over time might reveal changes in risk for certain types of deaths, individuals, or facilities.

It is important to note that COVID-19 had a significant impact on jails and the criminal justice system overall (Jackson et al., 2021). For jails, it impacted the size of the population because many persons were diverted from incarceration and others released in response to the need for social distancing. For those who remained in jail, COVID-19 placed additional stress on a health care system that already faced many challenges delivering services. The specific impact of COVID-19 on jail deaths is outside of the scope of the data used in this report.

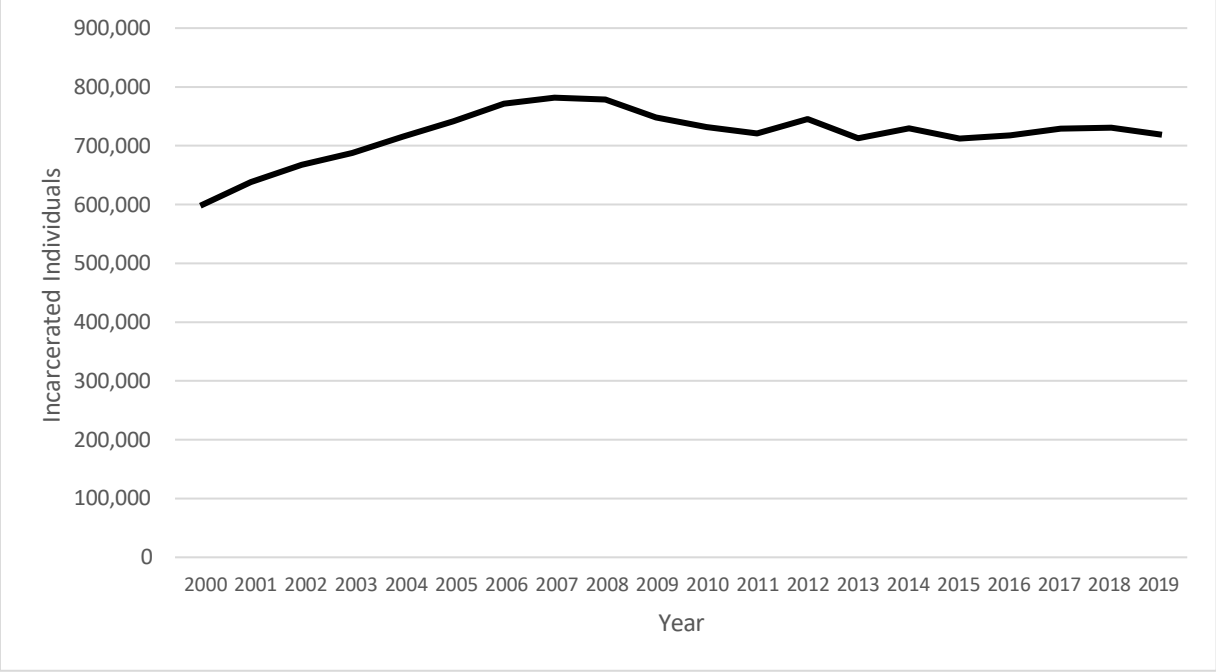
Concurrently, RTI conducted an environmental scan of the scientific and grey literature and current policies regarding deaths in jail custody. The environmental scan findings and recommendations presented below are based on (1) a review of relevant reports and policies from federal, state, and local agencies; professional organizations; and academic journals to identify the prevalence and correlates of jail deaths and strategies designed to reduce such deaths and (2) website scans of selected jails to identify enduring and emerging policies and practices related to jail deaths.

The literature review focused on several primary sources, including federal agencies responsible for collecting data related to deaths in custody such as the BJS and the Bureau of Justice Assistance, professional organizations that represent or interact in the jail sector (e.g., National Sheriff's Association, American Correctional Association, American Jail Association, National Commission on Correctional Health Care [NCCHC], National Institute of Corrections – Jails, and National Institute for Jail Operations), federal and state legislation pertaining to reporting deaths in custody, and academic and scholarly reports. We identified relevant materials through two approaches. RTI conducted keyword searches through electronic library databases to identify a wide range of related articles (e.g., "BJS in-custody deaths"). Second, we searched organizations' websites directly (e.g., searching "in-custody deaths" on BJS' website).

Overview of Deaths in Jail Custody – State of the Problem

A jail is a confinement facility generally operated under the authority of a sheriff, police chief, or county or city administrator (Zeng & Minton, 2021). Jails generally house individuals who are convicted of lesser crimes and serving sentences of less than 1 year; awaiting arraignment, trial, or other resolution of criminal charges; are in violation of the conditions of their probation, parole, or bail bond; or are being transferred to or from another secure facility. In 2019, there were 2,850 jail jurisdictions operating 3,116 public and private jail facilities (Zeng & Minton, 2021). In 2000, these facilities had an average daily population of 597,900, rising to 781,000 in 2007 before steadily declining to 741,900 in 2019.

Figure 1. *Estimated number of individuals in custody in local jails on an average day: 2000–2019*



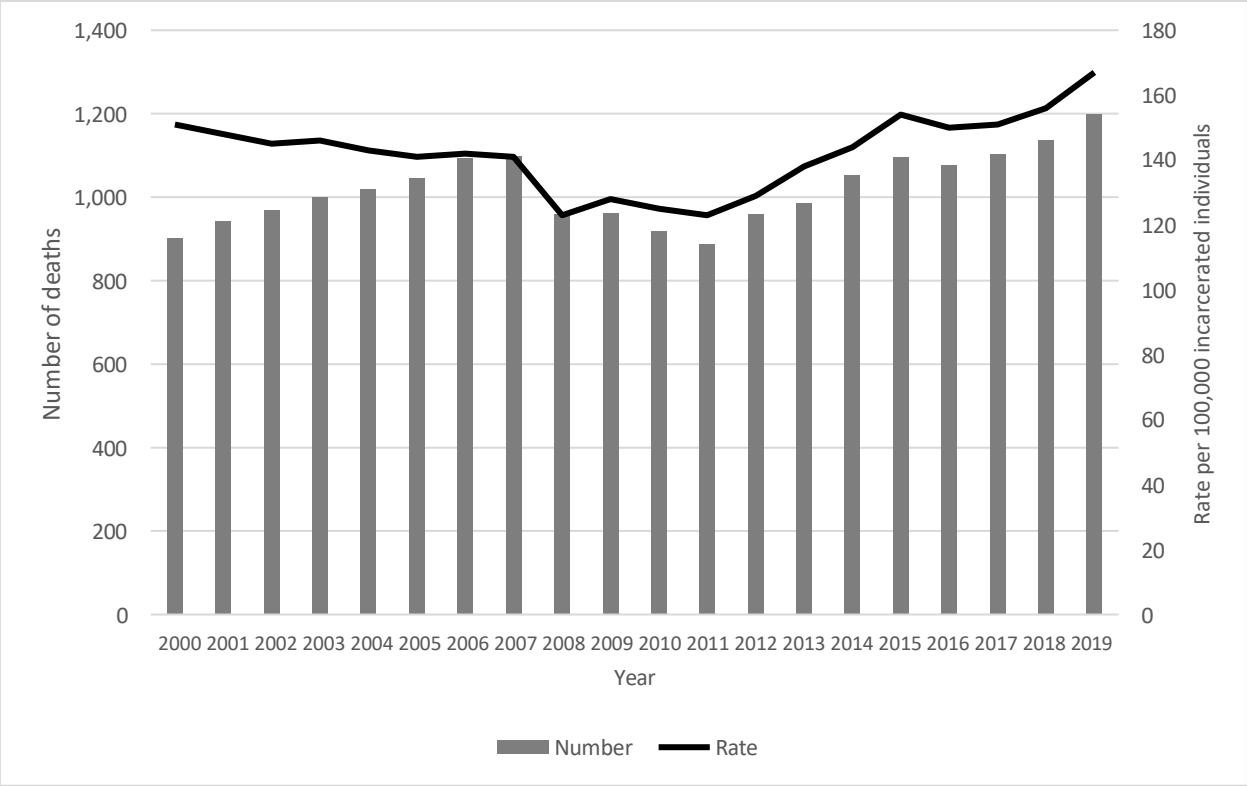
Source: Carson (2021a).

The total number of individuals held in jails on an average day increased from 597,908 in 2000 to 718,496 in 2019; however, the number of admissions to jails in a given year is much higher. In 2019, there were 10.3 million jail admissions in the United States. These numbers speak to the management challenges that jail administrators face with a constantly cycling jail population. The average jail experiences a 53% turnover in its incarcerated population on a weekly basis (Zeng & Minton, 2021). At the same time, many individuals repeatedly cycle through jails for relatively short stays, posing challenges to addressing their mental and medical health needs.

The Prevalence of Jail Deaths

In 2019, 1,200 individuals died while in the custody of local jails—a 5% increase from 2018 (1,138 deaths) and a 33% increase from 2000 (903 deaths). Between 2000 and 2007, the number of deaths increased from 903 to 1,099 and then dropped to a low of 888 in 2011. Since 2011, the number of deaths steadily increased by 35% to 1,200 in 2019. The change in the number of deaths in jails over time can be partially attributed to changes in the jail populations and expressed as the rate of deaths per 100,000 incarcerated individuals. Although similar in more recent years, the trends between prevalence death counts and rates did vary. In 2000, the rate was 151 deaths per 100,000 incarcerated individuals. This declined to 123 deaths per 100,000 incarcerated individuals in 2008, remaining flat over the next 3 years through 2011. Since 2011, the rate steadily increased to a high of 167 deaths per 100,000 in 2019.

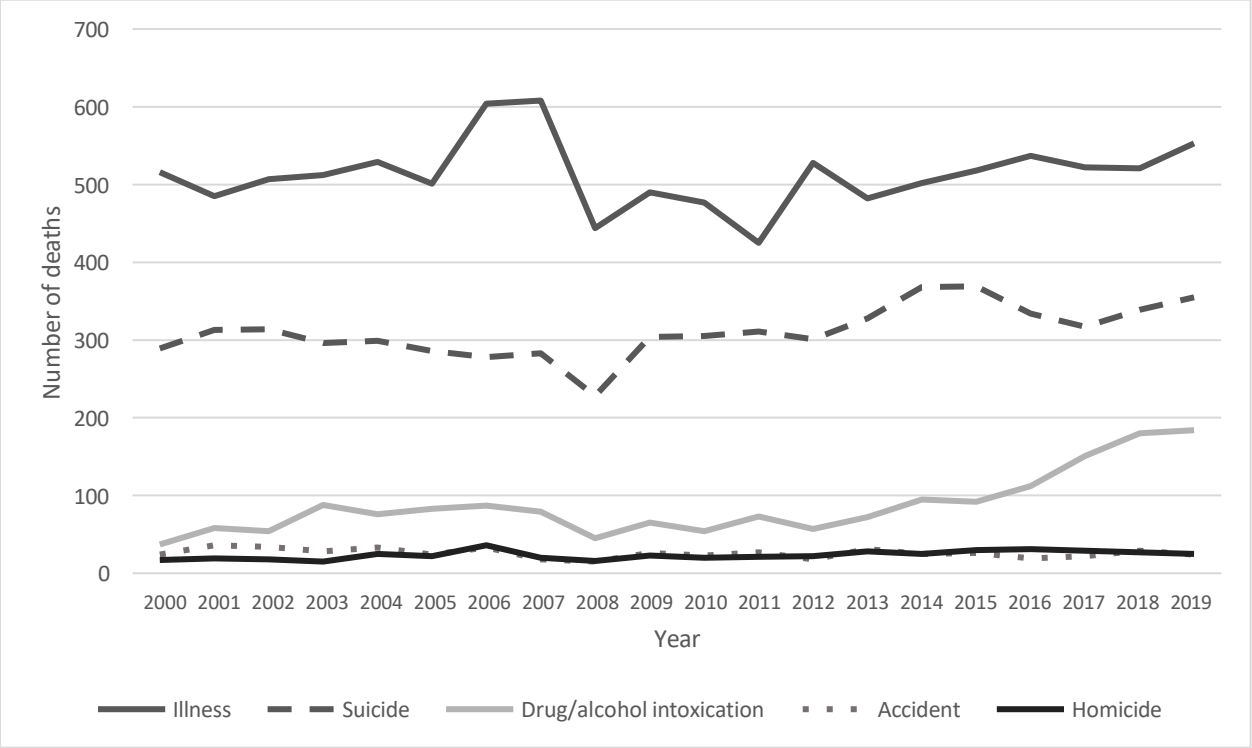
Figure 2. *Number and mortality rate of jail deaths: 2000–2019*



Source: BJS, Mortality in Correctional Institutions, 2000–2019.

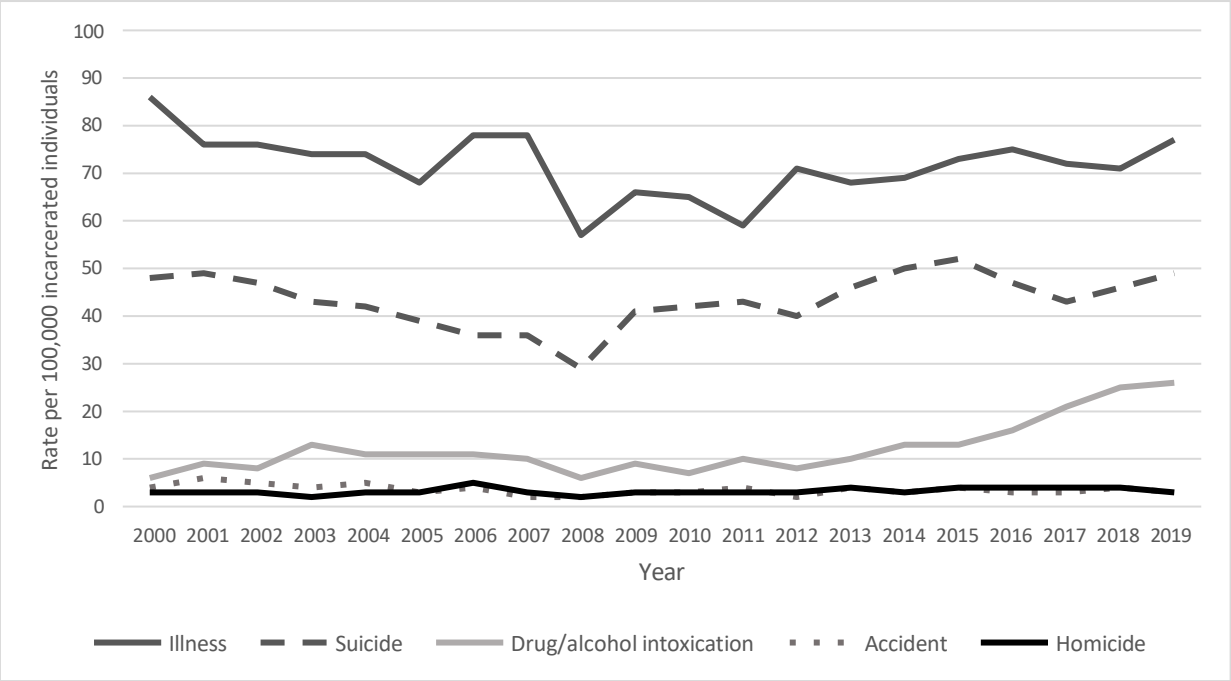
BJS' Mortality in Correctional Institutions collection classifies deaths by manner (homicide, suicide, natural causes, accident, or undetermined), further classifies natural manners of death by the underlying cause (e.g., heart disease, cancer), and separately tabulates deaths caused by drug/alcohol intoxication (which may be classified as accidental because of natural causes or other manners depending on the circumstances found by a medical examiner or coroner). The predominant manner of jail deaths is "natural deaths" caused by illness, followed by suicide and intoxication (Figure 3). In 2000, 516 deaths or 57% of all deaths of incarcerated individuals were attributed to illness. This spiked to a high of over 600 deaths in 2007–2008, falling to a low of 425, or 48% of all deaths in 2012. Between 2012 and 2019, the number slowly rose to 553 in 2019, accounting for 46% of all jail deaths. The rate of natural deaths followed a slightly different trajectory between 2000 and 2019 but experienced a similar rise between 2011 and 2019 (Figure 4). From 2000 to 2019, the rate of deaths caused by illness decreased from 86 deaths per 100,000 to 59 deaths per 100,000 in 2011 before steadily rising to 77 deaths per 100,000 in 2019. The primary illness-related death in this period was heart disease (Figure 5). Between 2008 and 2019, the rate of heart disease deaths in jails steadily increased from 23 deaths per 100,000 to 41 deaths per 100,000.

Figure 3. *Number of jails deaths, by manner of death: 2000–2019*



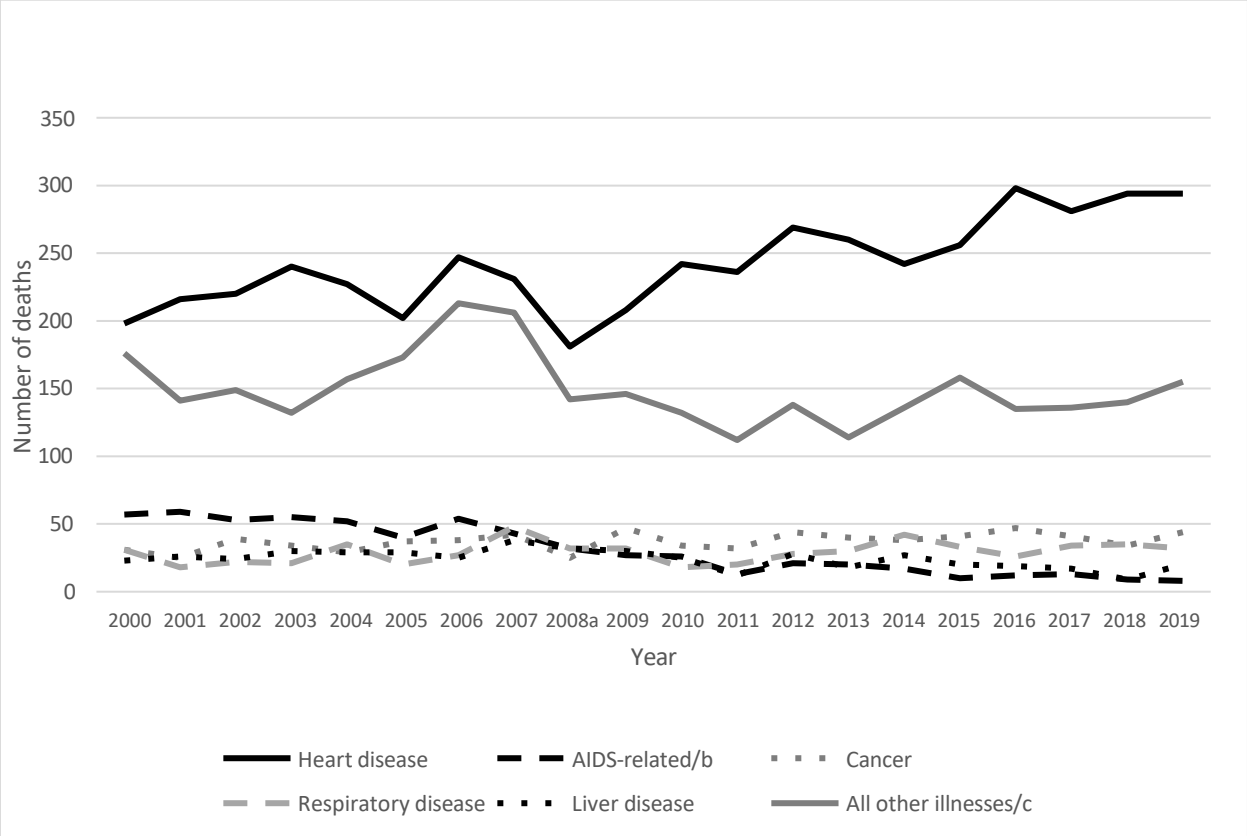
Source: BJS, Mortality in Correctional Institutions, 2000–2019.

Figure 4. *Mortality rate per 100,000 incarcerated individuals, by manner of death: 2000–2019*



Source: BJS, Mortality in Correctional Institutions, 2000–2019.

Figure 5. *Number of jails illness deaths, by manner of death: 2000–2019*



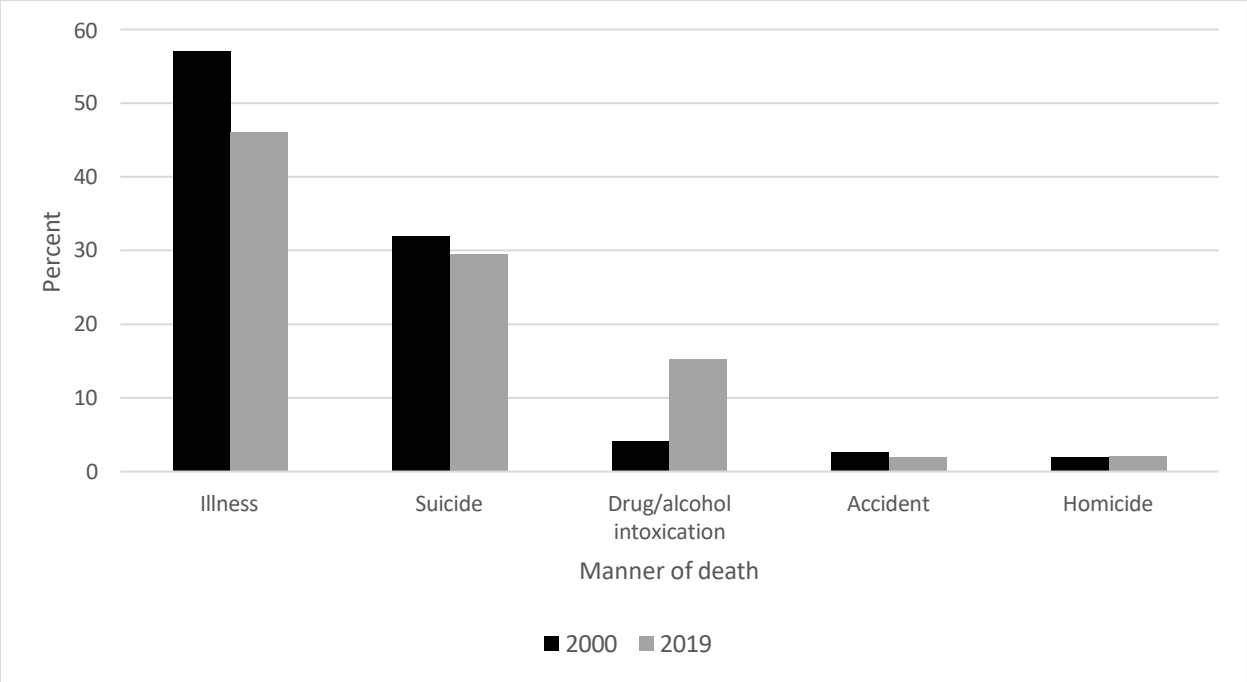
[a] Several illness cases were missing cause of death information and were classified as missing.
[b] Includes individuals who died of illness and were identified as HIV-positive or having AIDS at the time of death.
[c] Includes other specified illnesses (such as cerebrovascular disease, influenza, and other nonleading natural causes of death) and unspecified illnesses.
Source: BJS, Mortality in Correctional Institutions, 2000–2019.

The decline in the percentage of all deaths attributed to illness (down from 57% to 46%) is not due to a decrease in these deaths but rather to increases in the number of suicides and intoxication-related deaths (Figure 6). Beginning in 2018 through 2019, these two unnatural manners of death accounted for an increasing share of total deaths. Suicide was the second major manner of death with 355 deaths in 2019, accounting for 30% of all deaths. The number of suicides remained relatively stable between 2000 to 2012 (289 and 301, respectively) but climbed to a high of 369 deaths in 2015 before dropping to the more recent level of 355 deaths (Figure 3). The rate of suicide declined from 48 deaths per 100,000 incarcerated individuals in 2000 to a low of 29 deaths per 100,000 in 2008, before rising back up to 49 deaths per 100,000 in 2019 (Figure 4).

In contrast to illness and suicide, the number and rate of deaths caused by drug and alcohol intoxication more than quadrupled since 2000, with most of the increase occurring in the past 7 years (Figures 3 and 4). In 2000, 37 individuals were reported to have died by intoxication in U.S. jails. This number increased to 184 deaths in 2019. Similarly, from 2000, the rate of 6 intoxication deaths per 100,000 incarcerated individuals rose to 26 deaths per 100,000 in 2019.

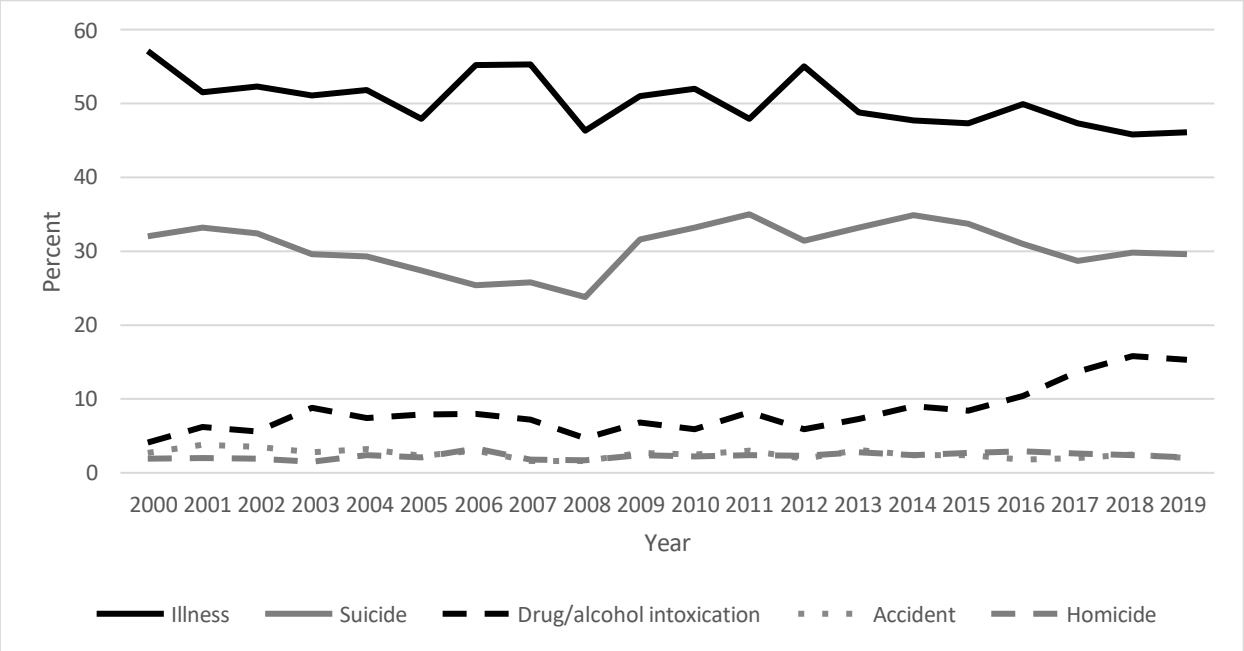
Homicide and accidents account for a very small percentage of all jail deaths each year. An average of 25 individuals in jails were killed by homicide and another 25 by accidents each year between 2000 and 2019 (Figure 3).

Figure 6. *Percent distribution of jail deaths, by manner of death: 2000, 2019*



Note: Homicide includes those committed by other inmates, incidental to the use of force by staff and resulting from assaults sustained prior to incarceration.
Source: BJS, Mortality in Correctional Institutions, 2000–2019.

Figure 7. *Percent distribution of jail deaths, by manner of death: 2000–2019*



Source: BJS, Mortality in Correctional Institutions, 2000–2019.

Summary of the Prevalence and Manners of Deaths in Jail Custody

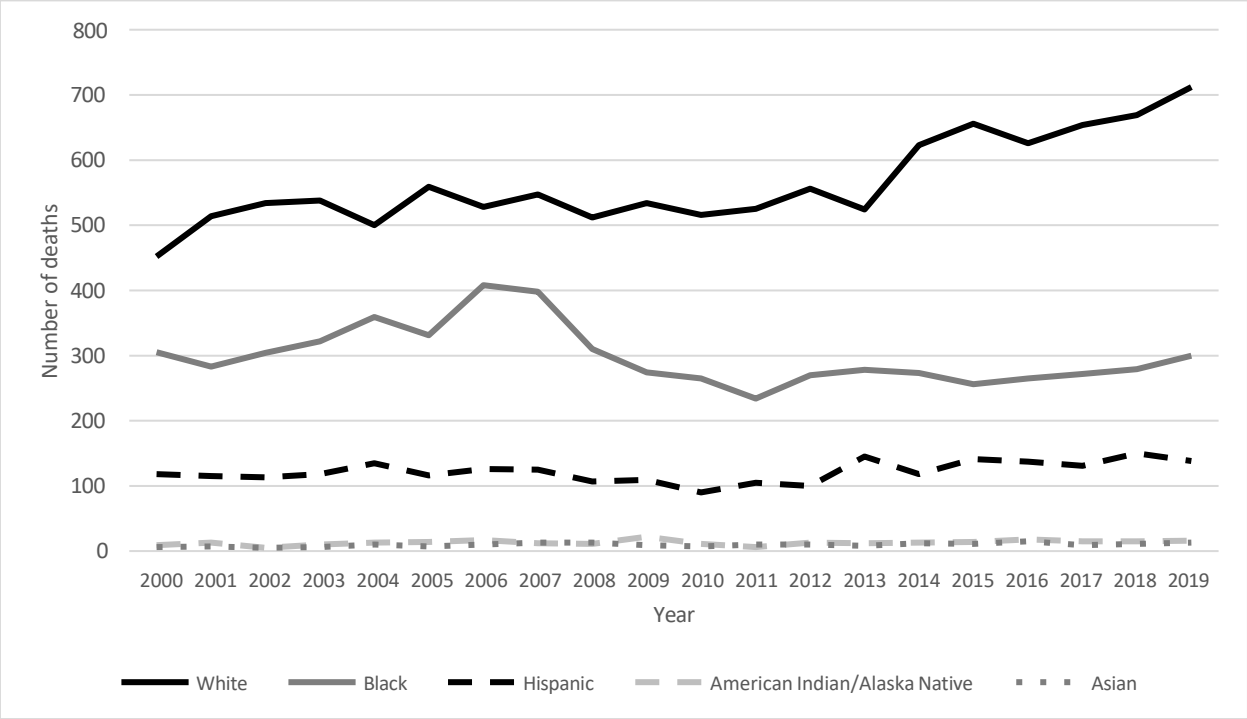
- In 2019, 1,200 individuals died while in the custody of local jails—a 5% increase from 2018 (1,138 deaths) and a 33% increase from 2000 (903 deaths).
- Since 2011, the jail mortality rate has steadily increased from 123 per 100,000 incarcerated individuals to a high of 167 per 100,000 in 2019.
- The predominant manner of jail deaths was illness, followed by suicide and intoxication.
- The primary illness-related death is heart disease. From 2008 to 2019, the rate of heart disease deaths in jails steadily increased from 23 to 41 per 100,000 incarcerated individuals.
- In contrast to illness and suicide mortality rate, which have remained relatively stable over time, the alcohol/drug intoxication rate has more than quadrupled from 2000 to 2019, with most of the increase occurring in the past 7 years.
- Homicide and accidents account for a very small percentage of all jail deaths, each causing an average of 25 jail deaths per year.

Who Dies in Jail?

Race and Ethnicity

White individuals accounted for the largest number of deaths in jails across the entire period examined, and this number increased by 58% over time.[5] In 2000, 452 White individuals died while in jail custody, rising to 712 in 2019. When accounting for the size of the jail population, White individuals also had a higher mortality rate compared with Black and Hispanic individuals. In 2019, White individuals had a mortality rate of 256 per 100,000 incarcerated individuals compared with 136 for Black and 89 for Hispanic individuals. Although the mortality rate for American Indian/Alaska Native individuals tended to fluctuate during this period, the mortality rate for this group exceeded that of White individuals in 2009 at 222 deaths per 100,000 jailed persons. The mortality rate for Asian individuals increased by nearly 120% between 2000 and 2019, from 91 to 200 deaths per 100,000 jailed persons.

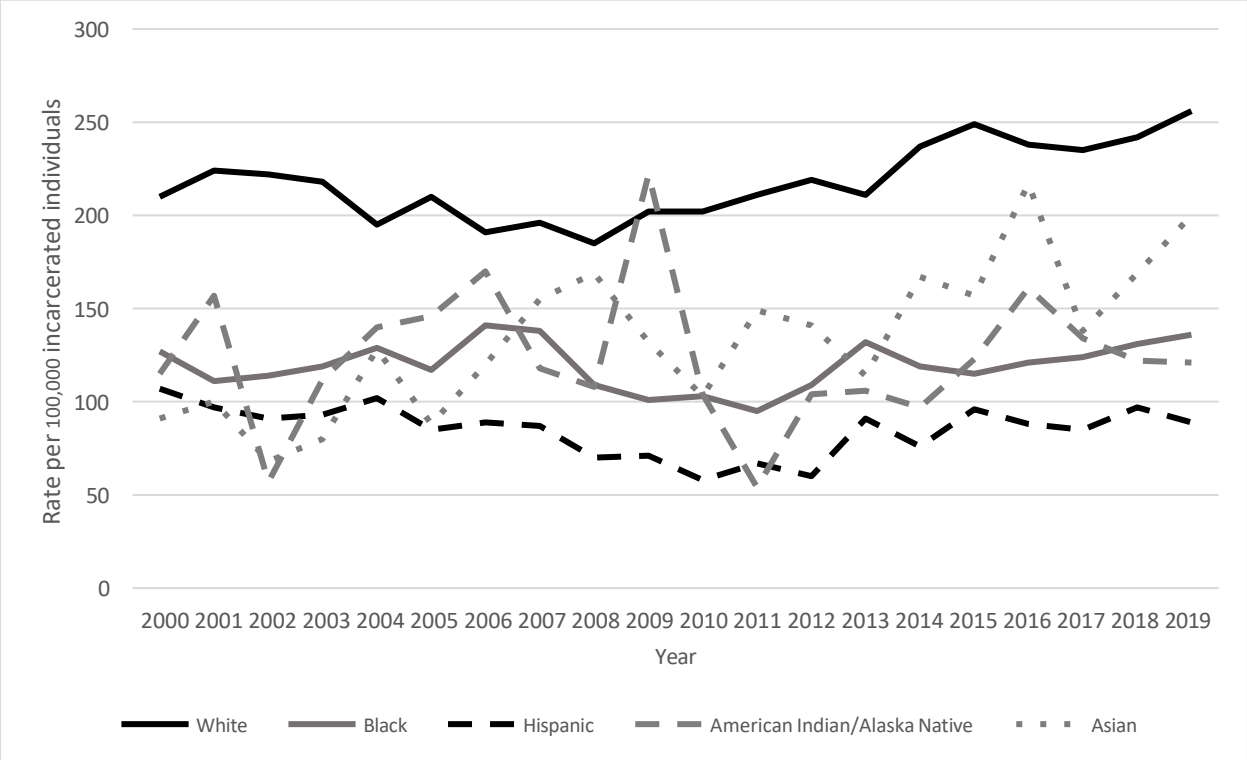
Figure 8. *Number of jail deaths, by race/ethnicity: 2000–2019*



Source: BJS, Mortality in Correctional Institutions, 2000–2019.

[5] Race/ethnicity are based on administrative reports and do not necessarily reflect how an incarcerated individual might self-identify. Eppler-Epstein et al. (2016) showed that 40 states reported race (e.g., "white," "black," "other") in their arrest records, but only 15 states reported ethnicity. Furthermore, states that use just "black" or "white" labels likely classify Latino persons as "white."

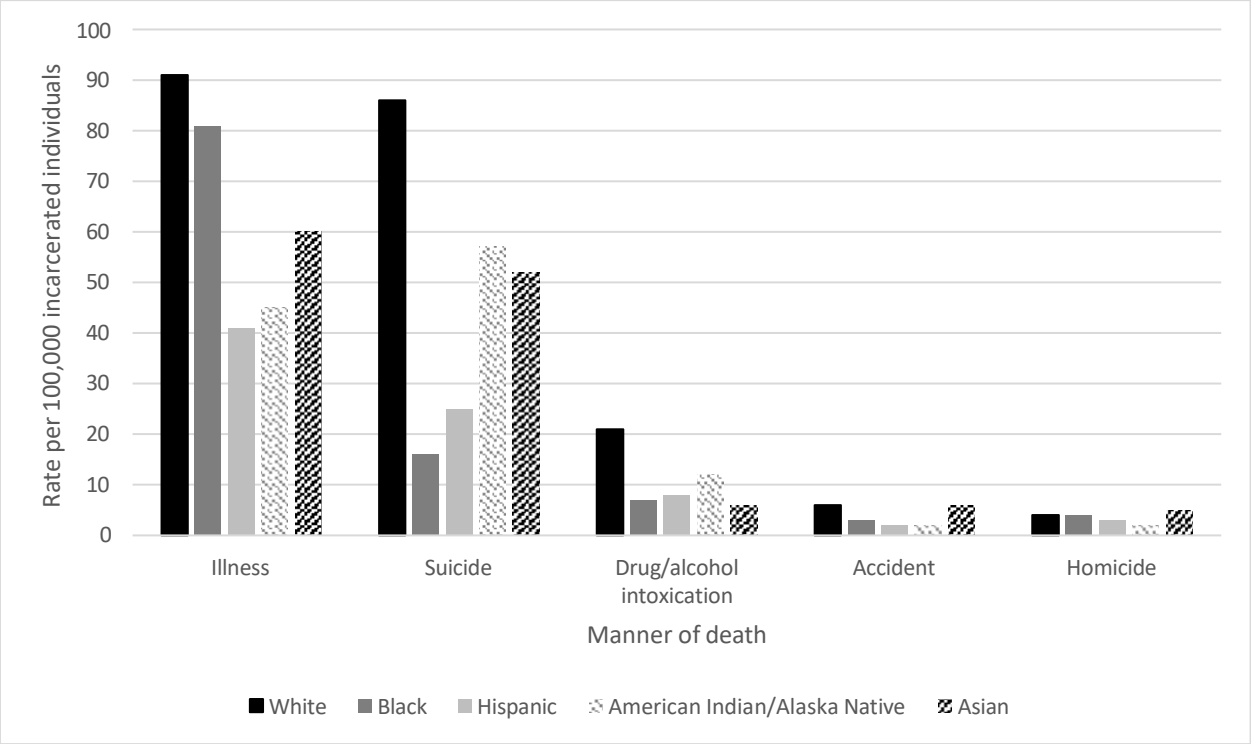
Figure 9. *Mortality rate per 100,000 individuals, by race/ethnicity: 2000–2019*



Source: BJS, Mortality in Correctional Institutions, 2000–2019.

The primary factor driving the higher mortality rate among White individuals is suicide and, to a lesser extent, deaths caused by intoxication. White individuals incarcerated in jails had a suicide mortality rate of 86 deaths per 100,000 compared with 16 deaths per 100,000 for Black individuals and 25 deaths per 100,000 for Hispanic individuals. The groups experiencing the second and third highest mortality rates for suicide were American Indian/Alaska Natives and Asians, at 57 and 52 deaths per 100,000 jailed persons, respectively. For drug and alcohol intoxication deaths, the mortality rate for White individuals was 21 per 100,000 compared with 7 for Black individuals and 8 for Hispanic individuals. White individuals experienced slightly higher illness mortality rates than Black individuals, 91 versus 81 respectively, and over double compared with Hispanic individuals (41 per 100,000).

Figure 10. *Mortality rate per 100,000 incarcerated individuals, by race/ethnicity and manner of death: 2000–2019*

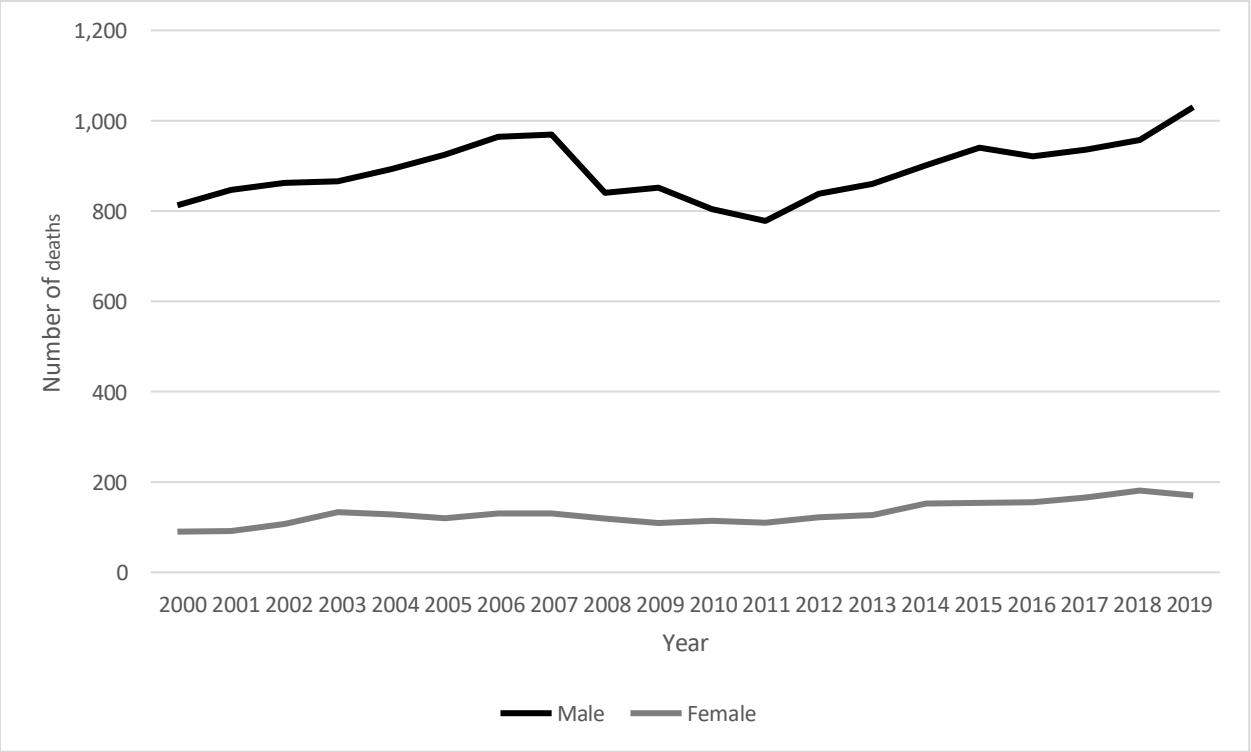


Source: BJS, Mortality in Correctional Institutions, 2000–2019.

Sex

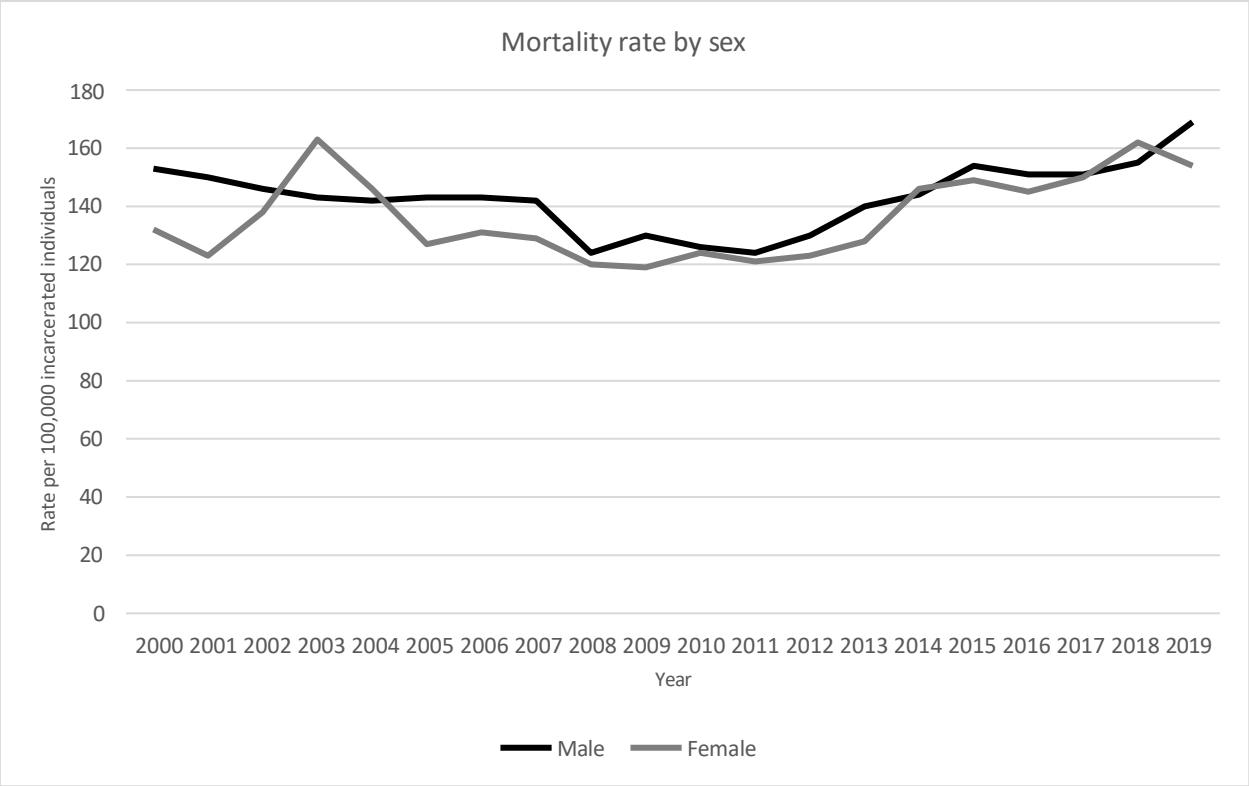
Men incarcerated in jails accounted for approximately 86% of all jail deaths in 2019, with 1,030 deaths compared with 170 for women (Figure 11). This large difference was consistent over the entire period from 2000–2019. However, men make up a larger share of the jail population. Examining the mortality rate, men and women show an approximately equal risk for death while in custody with slight divergences over time (Figure 12).

Figure 11. *Number of jail deaths, by sex: 2000–2019*



Source: BJS, Mortality in Correctional Institutions, 2000–2019.

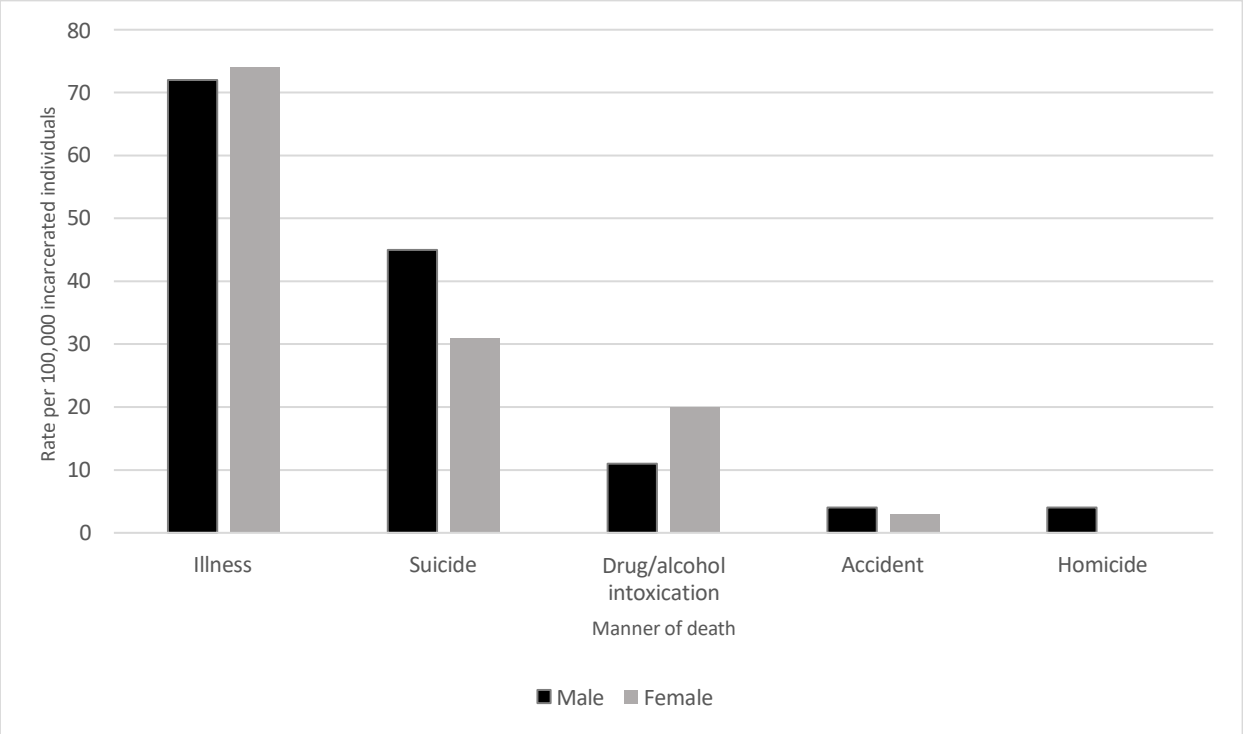
Figure 12. *Mortality rate per 100,000 incarcerated individuals, by sex: 2000–2019*



Source: BJS, Mortality in Correctional Institutions, 2000–2019.

Although the percentage of deaths attributable to illness is similar for men and women (72% and 74%, respectively), that is not the case for suicide and intoxication (Figure 13). Men have a significantly higher suicide rate of 45 deaths per 100,000 jailed persons compared with 31 deaths per 100,000 jailed persons for women. Women have a significantly higher rate of death due to intoxication of 20 deaths per 100,000 jailed persons, compared with 11 deaths per 100,000 jailed persons for men.

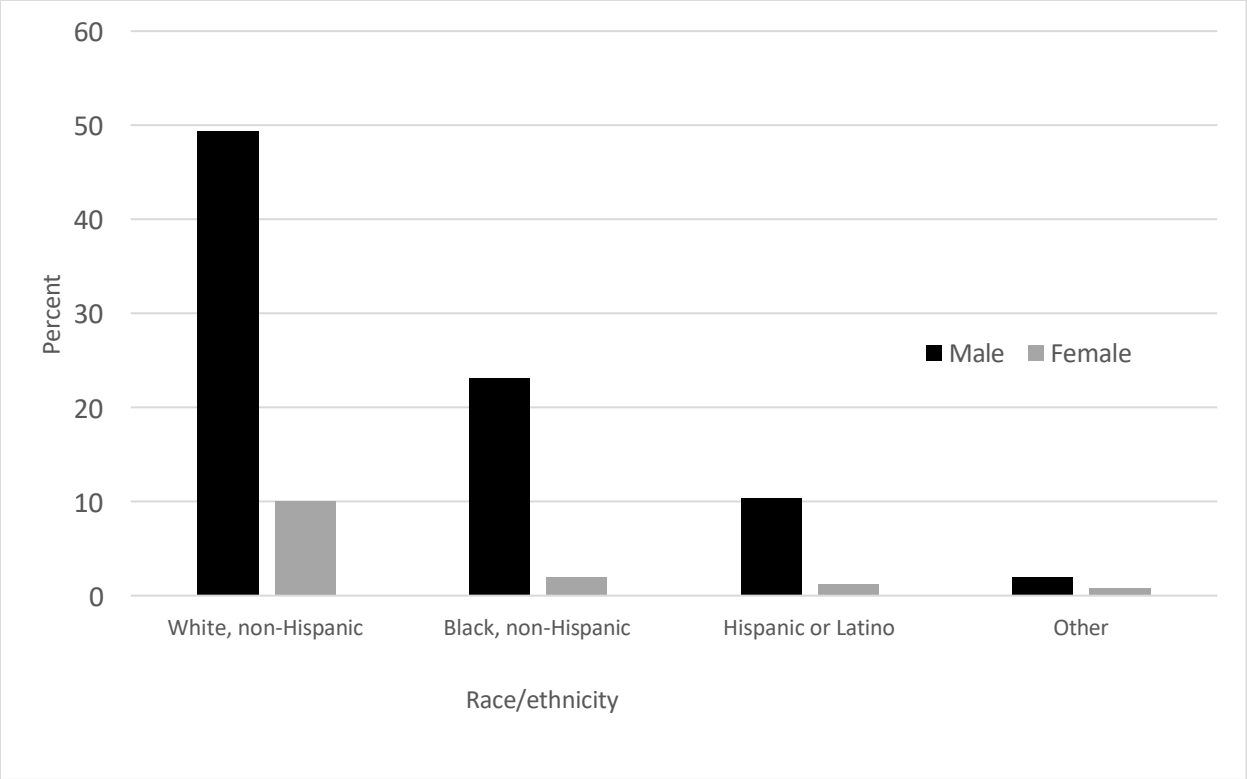
Figure 13. *Mortality rate per 100,000 incarcerated individuals, by sex and manner of death: 2000–2019*



Source: BJS, Mortality in Correctional Institutions, 2000–2019.

Examining the intersection of sex and race/ethnicity, we see that White men account for the largest percentage of deaths in jails (Figure 14). About 49% of all individuals who died in jail were White men, followed by Black men at 29%. White women and Hispanic men each accounted for 10% of all deaths. Black women accounted for 2% of all deaths.

Figure 14. *Percent of jail deaths, by sex and race/ethnicity: 2000–2019*

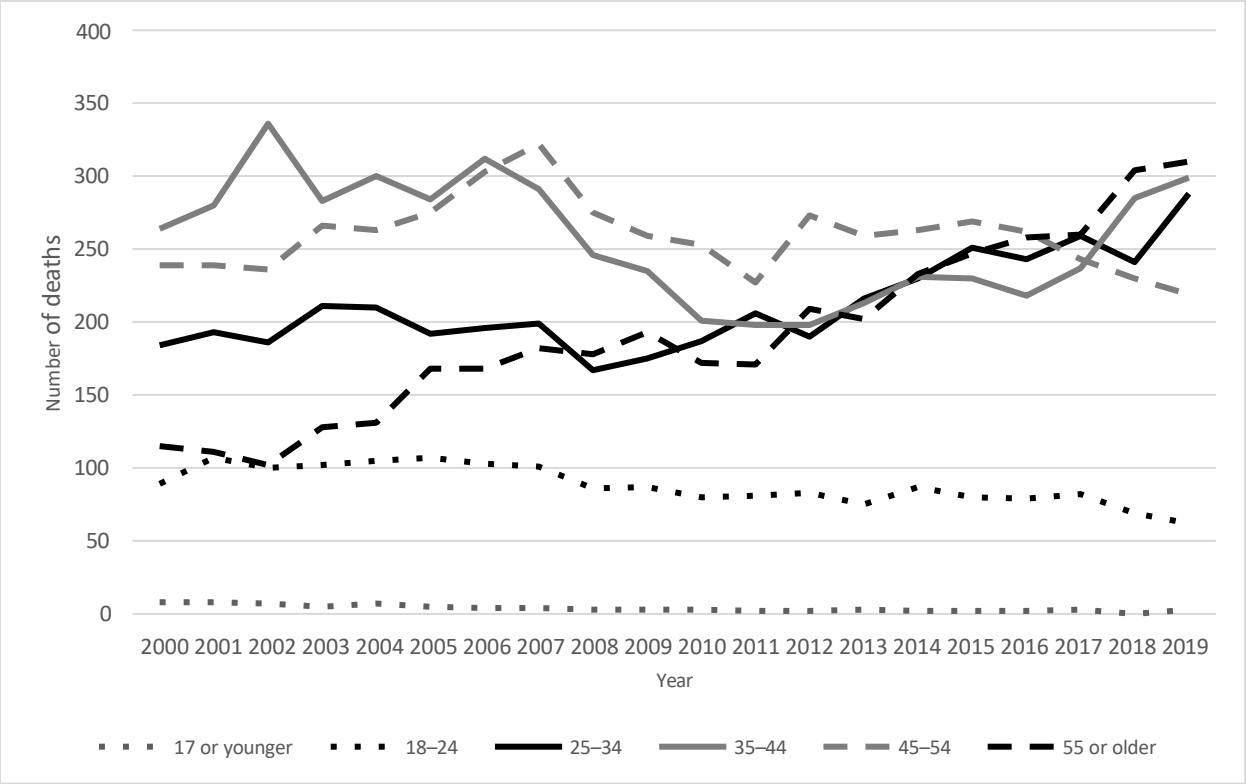


Source: BJS, Mortality in Correctional Institutions, 2000–2019.

Age

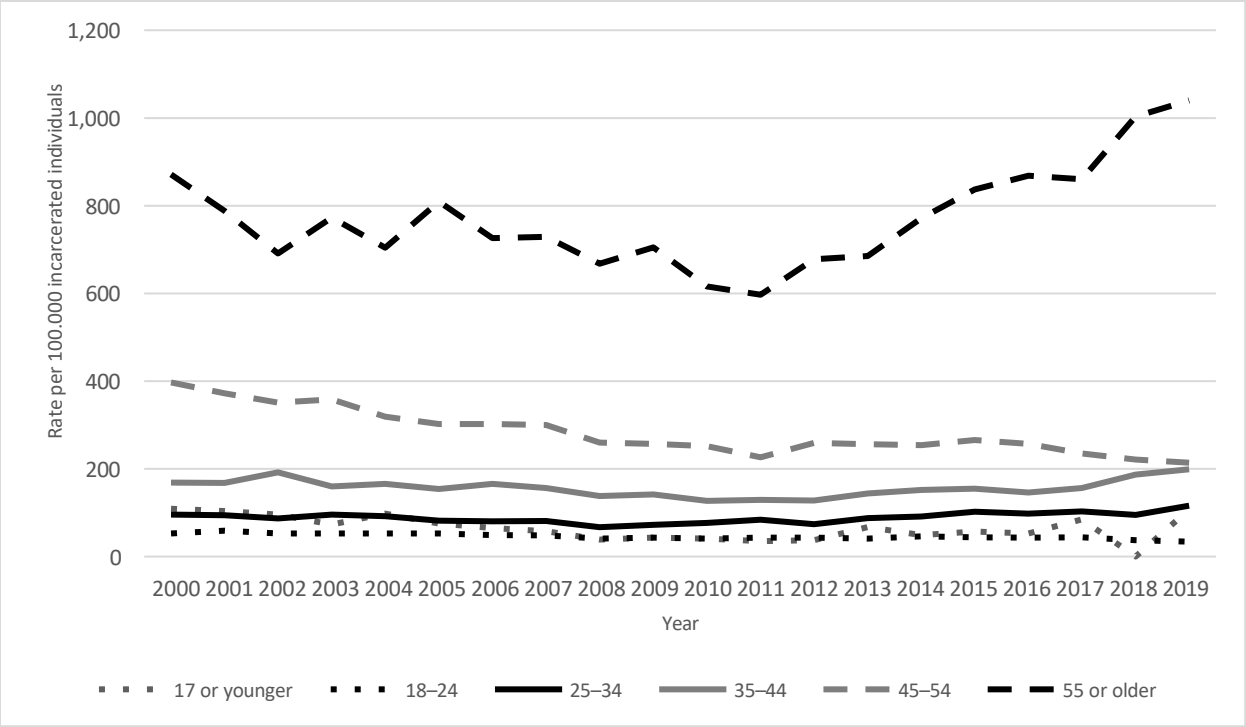
The age at which an individual dies in jail has increased over the years, which may be in part because of the aging population. In 2000, individuals 55 or older accounted for approximately 13% or 115 deaths, whereas they accounted for 26% or 310 deaths in 2019—the most for any age group. Meanwhile, those aged 18–24 accounted for 10% of deaths in 2000, down to approximately 5% in 2019. Examining mortality rates, individuals ages 55 or older had over 4 times the rate of death than other age groups, and this large difference has been consistent over time. In 2019, individuals ages 55 or older had a mortality rate of 1,040 per 100,000 compared with 214 for individuals ages 45–54 and 34 for individuals ages 18–24. The primary manner of death for individuals ages 55 or older was illness. The mortality rate for individuals 55 or older was 610 per 100,000 compared with 178 for individuals 45–54, the second highest group. There was slight variation across age groups for suicide and drug/alcohol intoxication deaths.

Figure 15. *Number of jail deaths, by age: 2000–2019*



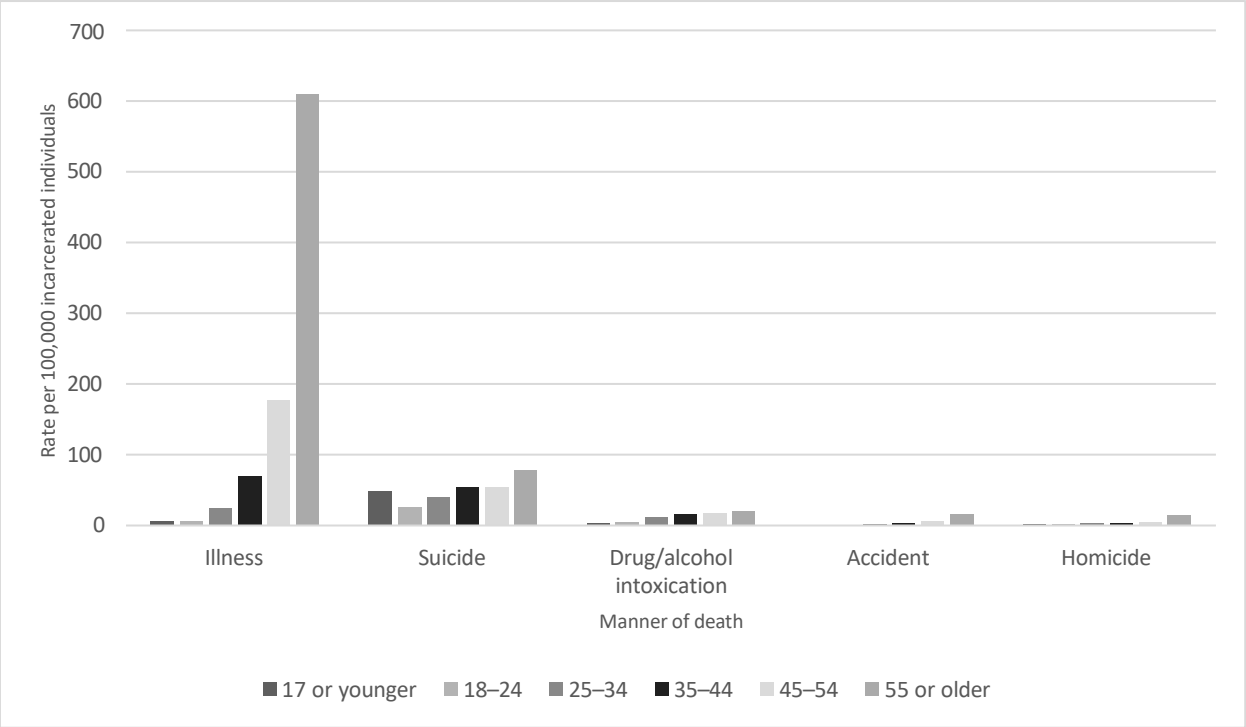
Source: BJS, Mortality in Correctional Institutions, 2000–2019.

Figure 16. *Mortality rate per 100,000 incarcerated individuals, by age: 2000–2019*



Source: BJS, Mortality in Correctional Institutions, 2000–2019.

Figure 17. *Mortality rate per 100,000 incarcerated individuals, by age and manner of death: 2000–2019*



Source: BJS, Mortality in Correctional Institutions, 2000–2019.

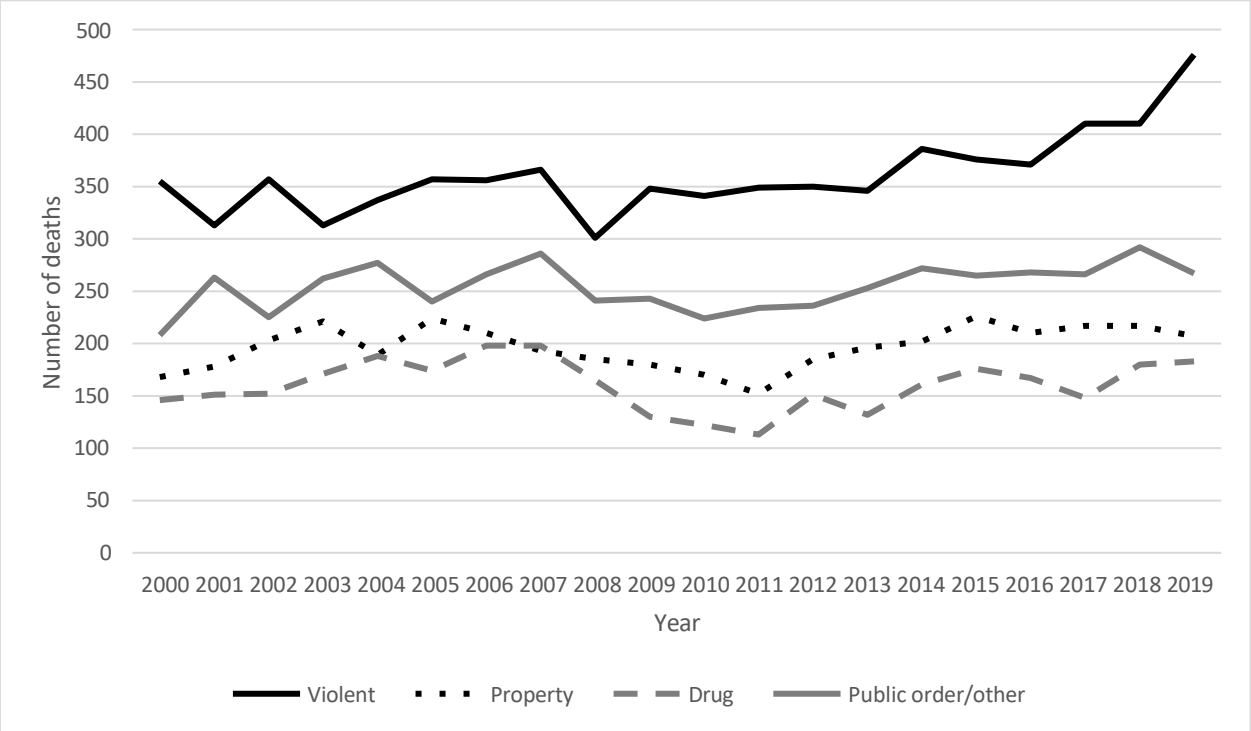
Offense Type

Persons in custody for violent offenses[6] accounted for the largest percentage of deaths in jails and had the highest mortality rate over the entire period. In 2019, 476 persons in jail for violent offenses died compared with 267 in for public order and other offense types,[7] 207 for property offenses, and another 183 for drug offenses. The mortality rate for persons in custody for violent offenses increased from 171 per 100,000 incarcerated individuals in 2008 to a high of 294 in 2019. The number and mortality rate for the other offense categories remained stable over this same period.

[6] This section describes mortality by the offense type for which individuals were in custody, regardless of whether they had been convicted of the offense.

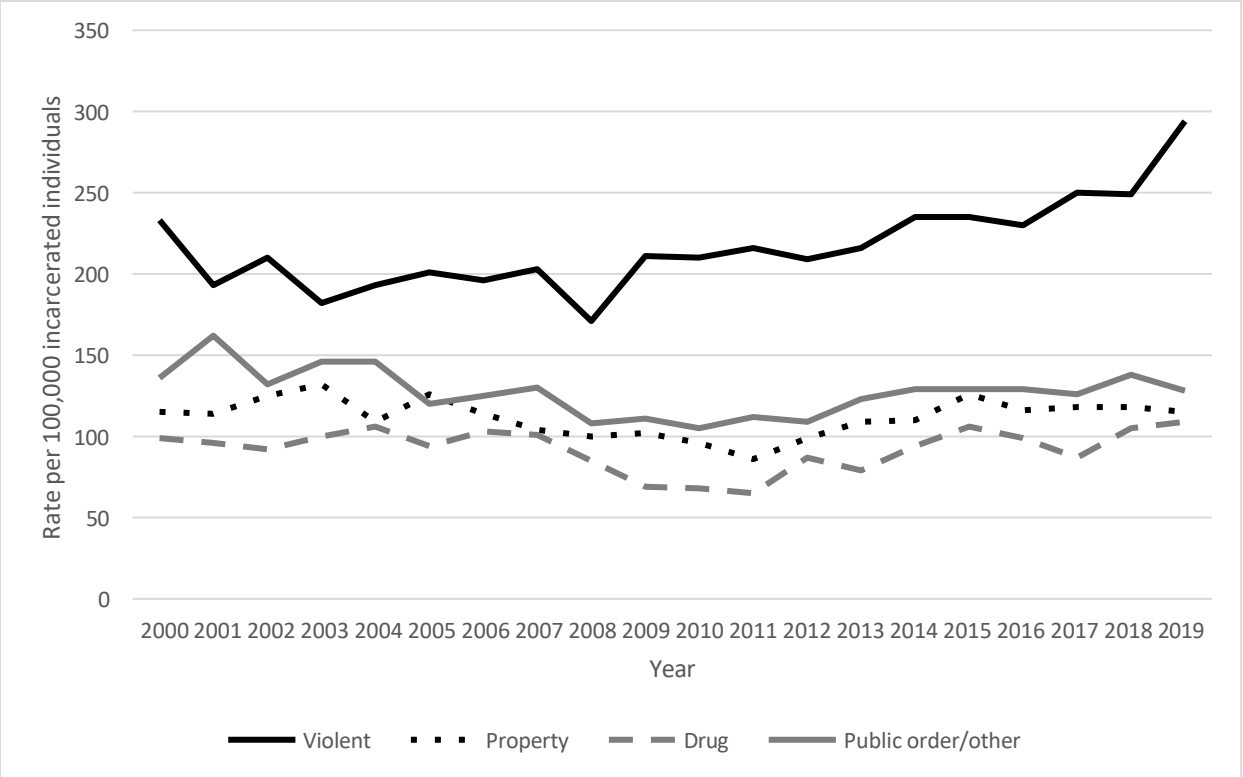
[7] Public order offenses include weapons offenses, driving under the influence (DUI)/driving while intoxicated (DWI), court offenses, commercialized vice, and morals and decency offenses. Other offenses include holds and holds for other jurisdictions and probation and parole violations.

Figure 18. *Number of jails deaths, by offense type: 2000–2019*



Source: BJS, Mortality in Correctional Institutions, 2000–2019.

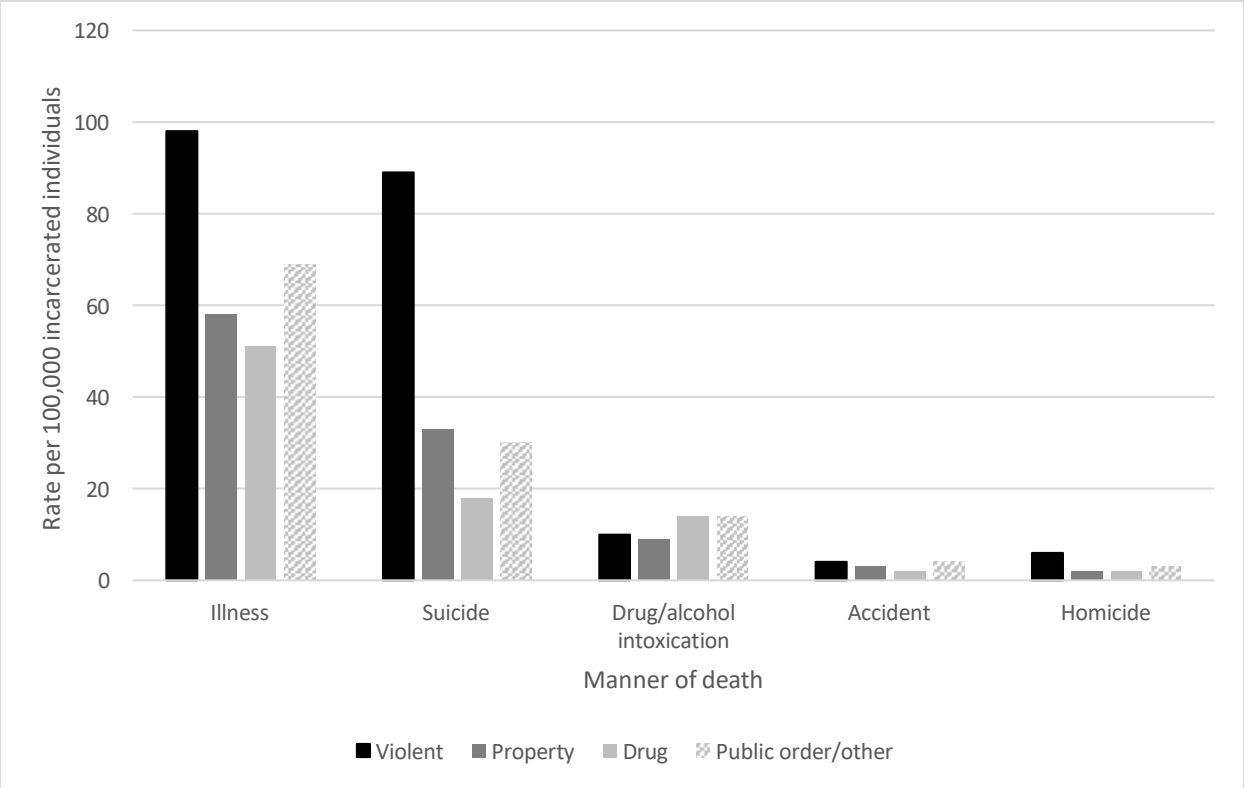
Figure 19. *Mortality rate per 100,000 incarcerated individuals, by offense type: 2000–2019*



Source: BJS, Mortality in Correctional Institutions, 2000–2019.

The primary manners of death for persons in custody for a violent offense are both illness and suicide. The illness mortality rate for persons incarcerated for violent offenses was 98 per 100,000 compared with 51 to 69 for property, drug, and public order offenses. Similarly, individuals in custody for violent offenses had a suicide mortality rate of 89 per 100,000, 2.5 to 4 times more than individuals incarcerated for property, drug, and public order offenses.

Figure 20. *Mortality rate per 100,000 incarcerated individuals, by offense type and manner of death: 2000–2019*

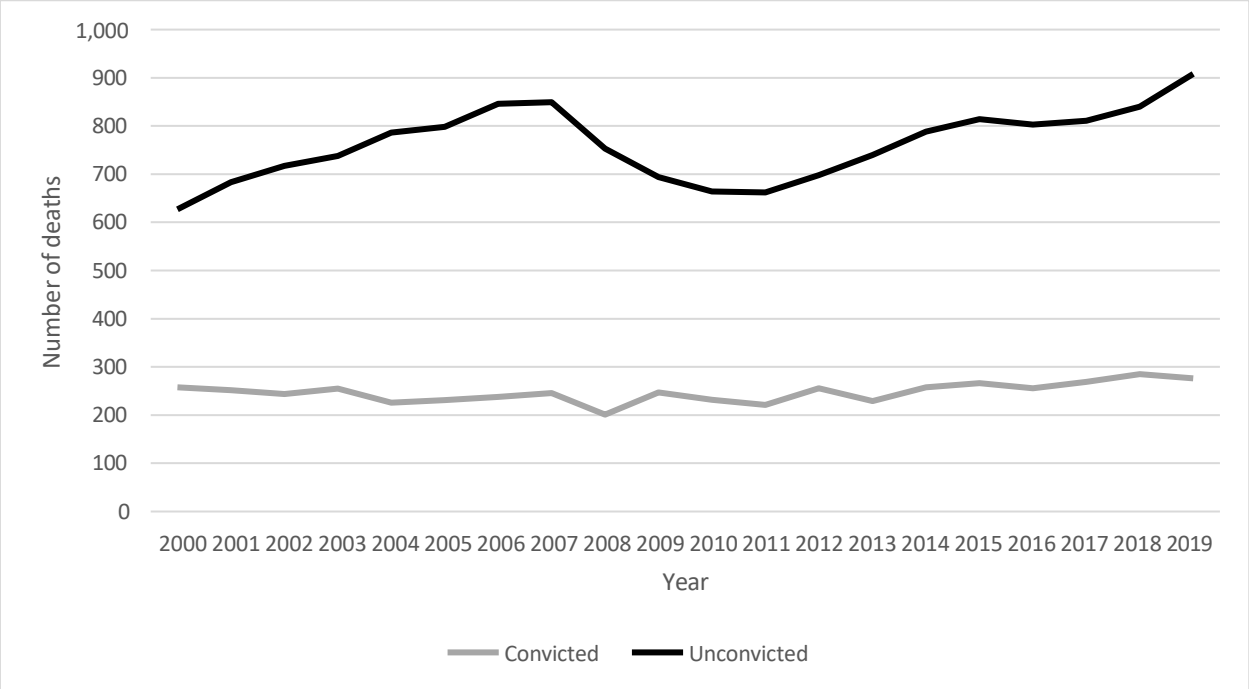


Source: BJS, Mortality in Correctional Institutions, 2000–2019.

Conviction Status

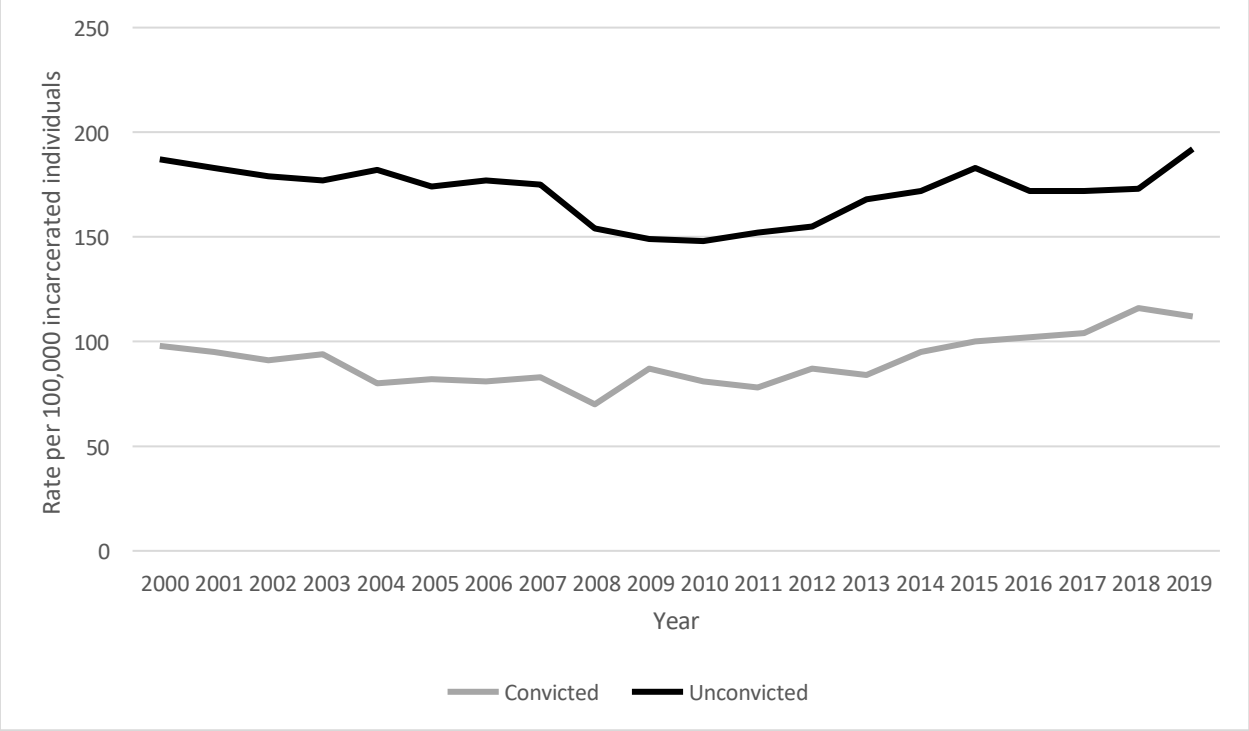
Incarcerated individuals with an unconvicted status had both a higher number of deaths and mortality rate than those convicted (new court commitment or returned probation/parole violator). In 2019, 908 unconvicted individuals died while in custody, up from 627 in 2000. In comparison, 276 convicted individuals died in 2019 compared with 258 in 2000. Similarly, unconvicted individuals had a consistently higher mortality rate from 2000–2019 than convicted individuals. In 2019, unconvicted individuals had a mortality rate of 192 deaths per 100,000 incarcerated individuals compared with 112 deaths per 100,000 for those who were convicted.

Figure 21. *Number of jail deaths, by legal status: 2000–2019*



Source: BJS, Mortality in Correctional Institutions, 2000–2019.

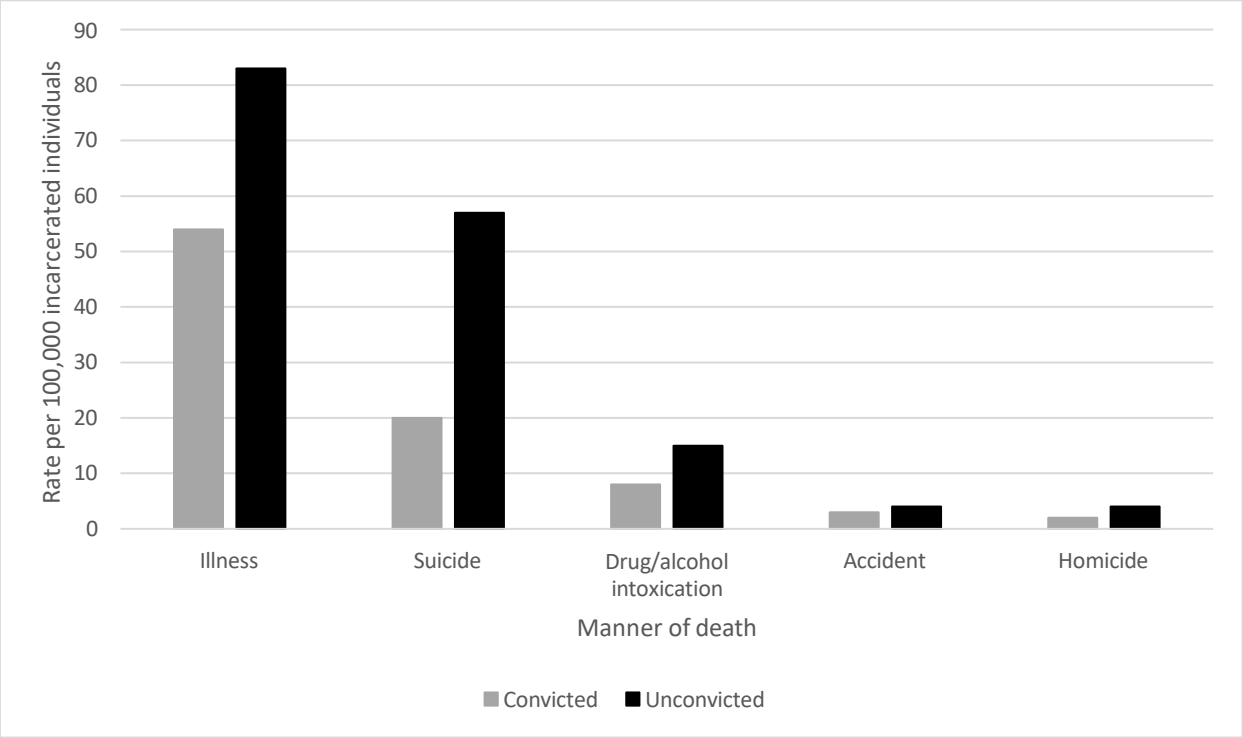
Figure 22. *Mortality rate per 100,000 incarcerated individuals, by legal status: 2000–2019*



Source: BJS, Mortality in Correctional Institutions, 2000–2019.

Unconvicted individuals had a higher mortality rate across all three major manners of deaths than those who were convicted. The illness mortality rate for unconvicted individuals was 83 deaths per 100,000 incarcerated individuals compared with 54 for convicted, 57 compared with 20 for suicide, and 15 compared with 8 for drug/alcohol intoxication.

Figure 23. *Mortality rate per 100,000 incarcerated individuals, by legal status and manner of death: 2000–2019*



Source: BJS, Mortality in Correctional Institutions, 2000–2019.

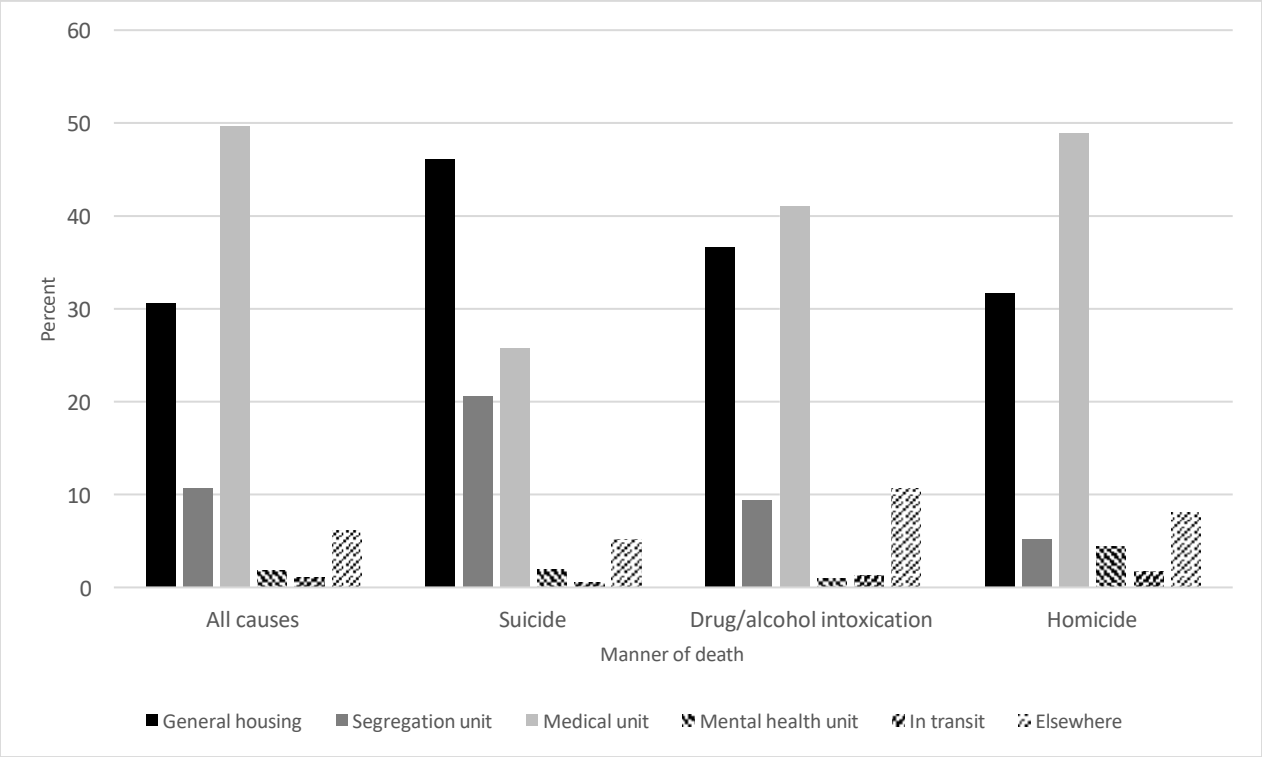
Summary of the Characteristics of Individuals Who are Dying in Jails

- The populations with the most risk for death in U.S. jails as measured by mortality rate are White persons, persons ages 55 or older, persons incarcerated for violent offenses, and those who are unconvicted.
- The racial/ethnic differences were primarily driven by higher suicide rates for White persons.
- Older incarcerated persons primarily died from illness.
- Persons incarcerated for alleged or convicted violent offenses had higher mortality rates for illness and suicide.
- Although there were few differences in the mortality rates for males and females over time, their rates were driven by different manners of death. Males had a higher suicide rate whereas females had a higher drug/intoxication rate.

Circumstance of Jail Deaths

Examining the location within a jail facility where a death occurred can possibly point to areas that are most at risk for certain deaths. Most jail deaths occur in a medical unit (50%) or in general housing (31%). In medical units, individuals may be receiving care for an illness or treatment following a self-inflicted injury, intoxication, or assault. Another 11% of jail deaths occurred in segregation or restricted housing unit. Segregation was a significantly more common location for suicide compared with other deaths (21%), but it is not clear whether placement in segregation increases suicide attempts or those with an increased risk for suicide are more likely to be placed in segregation. Location was generally the same for intoxication deaths, with most deaths occurring in a medical unit or general housing.

Figure 24. *Location of jail deaths, by manner of death: 2000–2019*



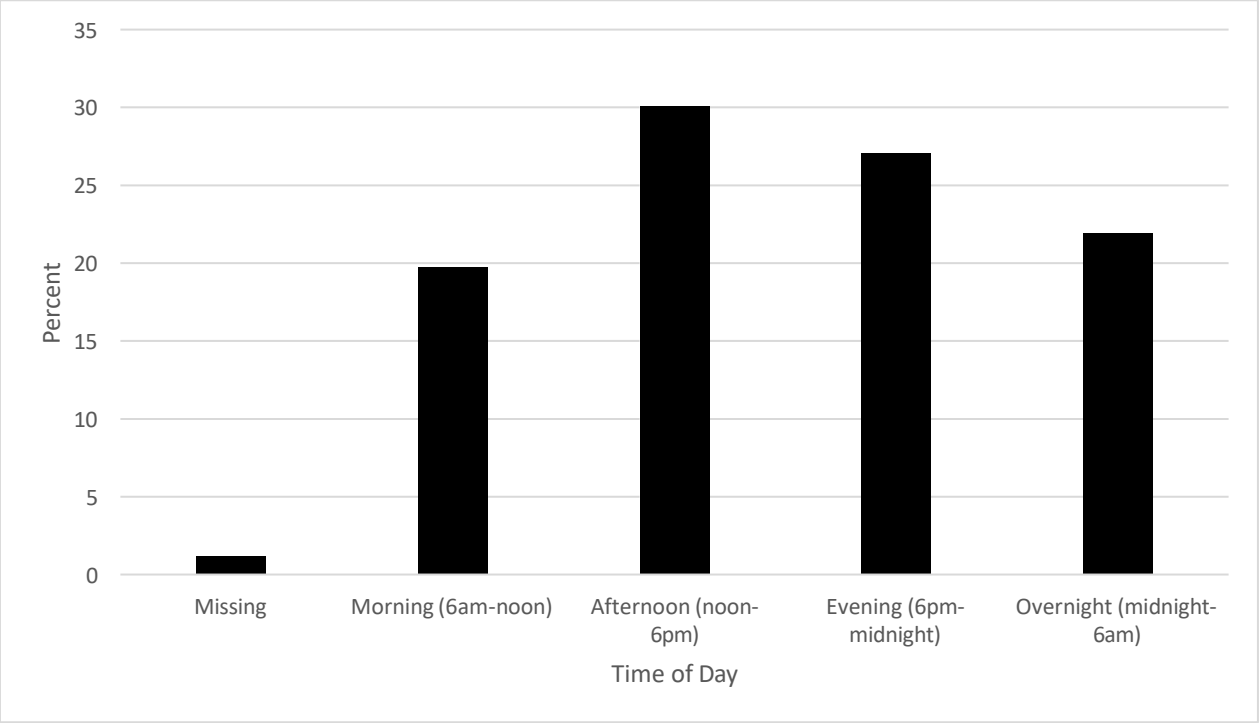
Source: BJS, Mortality in Correctional Institutions, 2000–2019.

Time of Day

For suicide, examining the time of day a death occurs may be a critical factor requiring additional surveillance of persons at risk. Afternoon and evening hours appear to account for most suicides, with the morning hours accounting for the fewest.[8]

[8] The low number of annual homicide deaths and the percentage missing for intoxication-related deaths did not support an analysis of time of day.

Figure 25. *Percent of jail suicide deaths, by time of day: 2010–2019*

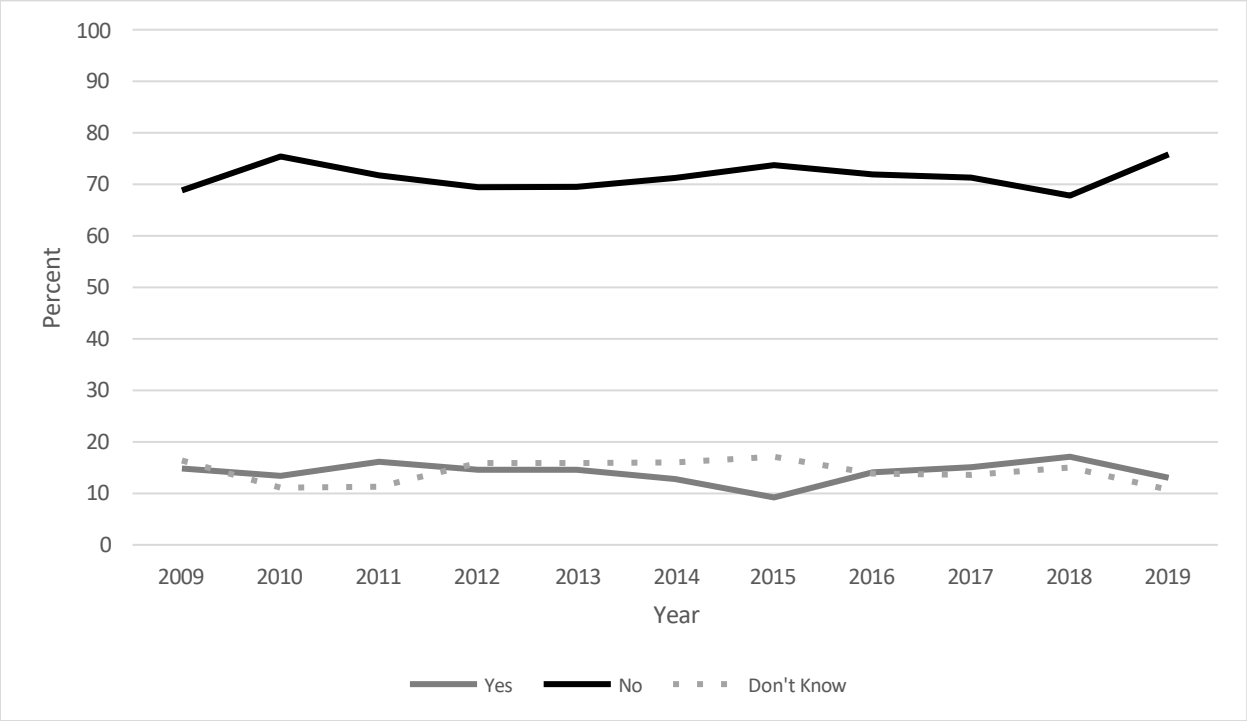


Source: BJS, Mortality in Correctional Institutions, 2000–2019.

Mental Health Observation or Unit Stay

Persons held in jail facilities may stay overnight in a mental health observation unit or an outside mental health facility. This might be an indicator of a person's mental status and risk for suicide. In 2019, about 13% of persons who died by suicide stayed overnight in a mental health unit or were under observation at some point since their admission (compared with 8% of homicide victims and just 4% of persons who died by drug/alcohol intoxication). This percentage has remained very stable over time.

Figure 26. *Percentage of suicide deaths where the incarcerated individual stayed overnight in a mental health observation or mental health unit after admission: 2009–2019*



Source: BJS, Mortality in Correctional Institutions, 2009–2019.

Summary of the Circumstances of Jail Deaths

- Most jail deaths occur in a medical unit (50%) or in general housing (31%).
- The afternoon and evening hours appear to account for the majority of suicides, with the morning hours accounting for the fewest.
- In 2019, about 13% of persons who died by suicide stayed overnight in a mental health unit or were under observation at some point since their admission.

Agency and Community Characteristics

Methods

The type and characteristics of the jail facility and community these jails serve may reveal factors associated with a higher risk for in-custody jails deaths. As such, the secondary analysis is focused on examining not only the prevalence and circumstances of deaths in jails but also the characteristics of facilities and communities that are associated with these deaths. To this end, RTI linked and analyzed several data sources. Specifically, RTI obtained data on deaths in

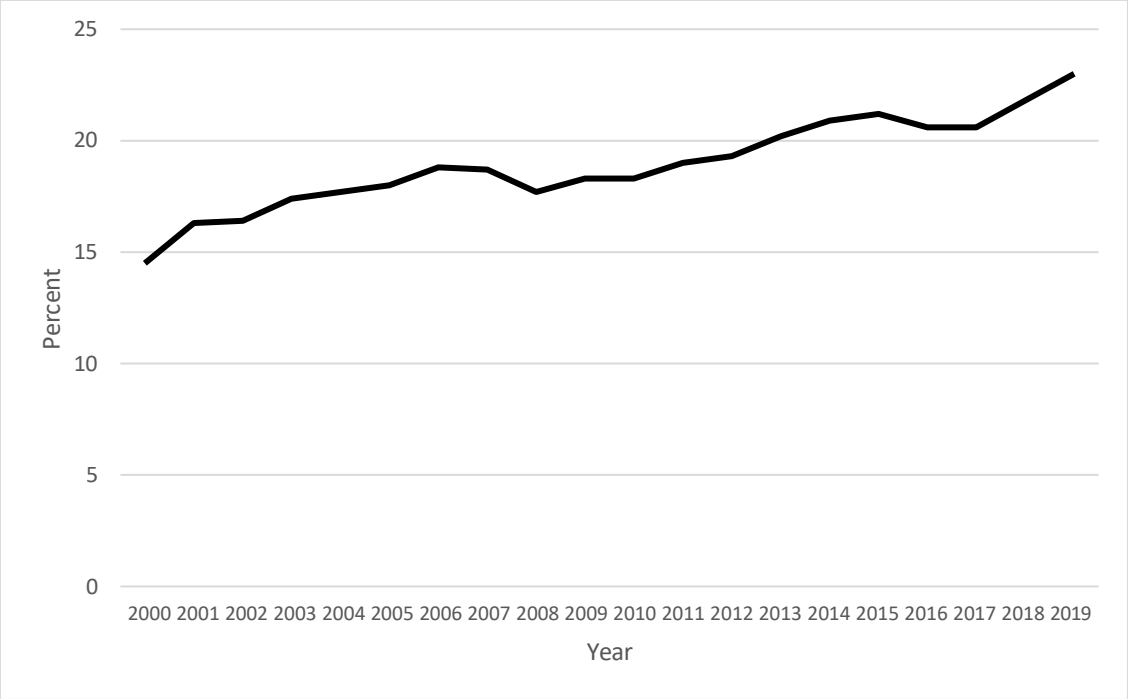
jails from 2006 to 2019 from the BJS collection of Mortality in Correctional Institutions (MCI).[9] These data were linked to data from BJS' 2006, 2013, and 2019 waves of the COJ to describe characteristics of facilities in which the deaths occurred.[10] RTI examined the distribution of deaths by facility characteristics, including size, jail operator, sex of incarcerated population held, purpose, function, and capacity. Finally, these data were further linked to the counties where the jail facilities were located using the American Community Survey (2009–2019). Using these integrated data, RTI conducted a series of analyses both at the facility (jail) level and at the jurisdiction level. RTI also examined these characteristics cross-sectionally and over time. The results of these analyses are presented below.

In 2000, just 14.5% of all jails reported one or more deaths, while 85.5% reported zero deaths of any manner. However, between 2000 and 2019, the percentage of jails reporting one or more deaths increased steadily over time to a high of 23% in 2019.

[9] MCI data are collected at the jurisdiction level with a facility name for each location of death.

[10] Jurisdiction identification is not provided on the 2019 COJ facility-level data. Best efforts were made to link the MCI deaths to the 2019 COJ facility-level data using the facility names and cities from both files. MCI deaths that could not be matched on facility name and city to the 2019 COJ were manually inspected. Deaths occurring in facilities that were non-responders of the 2019 COJ were excluded. Deaths that occurred in hospitals only serving one facility were assigned to that facility. Some deaths occurring in hospitals could not be linked directly to the decedent's facility due to the hospital serving multiple facilities within a jurisdiction. Rather than excluding these deaths from the analysis, fractional deaths were assigned (e.g., a hospital serving a jurisdiction with 4 facilities assigns the 3 deaths from that hospital as a death count of 0.75 to each of the 4 facilities, 4 deaths in the same hospital assigns a death count of 1 to each of the 4 facilities, and 5 deaths in that hospital assigns a death count of 1.25 to each of the 4 facilities). 43 out of 1,200 deaths occurring in 2019 were assigned to facilities using this method of apportioning. There were 49 deaths (representing 33 unique MCI facility names) occurring in 2019 that remained unmatched with the 2019 COJ data. Of the 33 facilities, 28 were COJ non-responders in 2019, and 5 could not be accounted for after all matching efforts.

Figure 27. *Percentage of jails with one or more in-custody deaths: 2000–2019*



Source: BJS, Mortality in Correctional Institutions, 2000–2019.

Most jails did not report a single suicide, intoxication, homicide, or accidental death each year. In 2019, 90% of jails had zero suicides, 95% had zero intoxication deaths, and 99% had zero homicides or accidents (Table 1).

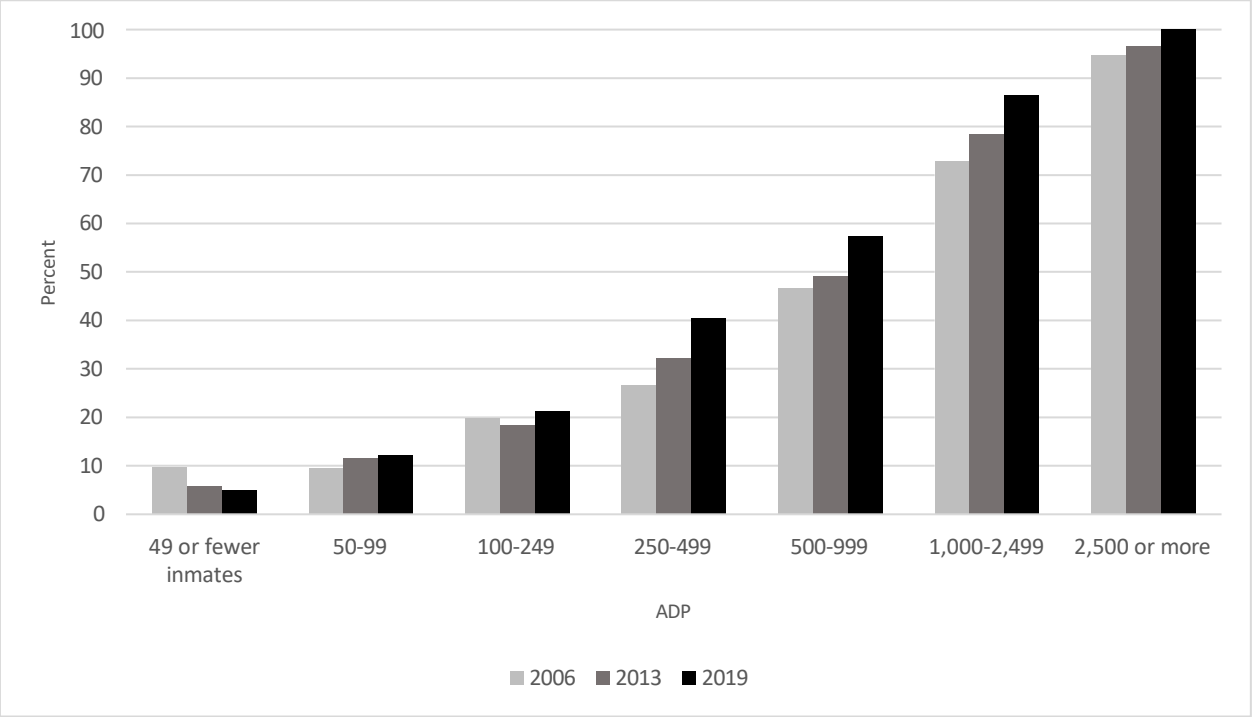
Table 1. *Percentage of local jail jurisdictions, by prevalence of deaths, manner of death, and selected characteristics: 2019*

Characteristic	No. of Jails	All Deaths		Suicide		Intoxication		Homicide		Accident	
		0	1+	0	1+	0	1+	0	1+	0	1+
Total	**2,845**	**77.5**	**22.5**	**90.2**	**9.8**	**94.8**	**5.2**	**99.2**	**0.8**	**99.2**	**0.8**
Average Daily Population											
49 or fewer confined persons	993	95.1	4.9	97.1	2.9	99.6	0.4	99.8	0.2	100.0	0.0
50–99	510	87.7	12.3	95.2	4.8	98.1	1.9	100.0	0.0	99.8	0.2
100–249	633	78.8	21.2	91.2	8.8	96.4	3.6	99.5	0.5	99.2	0.8
250–499	344	59.6	40.4	85.5	14.5	91.6	8.4	99.3	0.7	99.1	0.9
500–999	214	42.6	57.4	78.8	21.2	87.1	12.9	98.5	1.5	98.1	1.9
1,000–2,499	124	13.6	86.4	51.8	48.2	67.9	32.1	95.0	5.0	95.0	5.0
2,500 or more	27	0.0	100.0	42.7	57.3	39.3	60.7	77.1	22.9	84.8	15.2
Felony Status											
50% or more are felons	2,025	74.9	25.1	89.4	10.6	94.5	5.5	99.0	1.0	99.0	1.0
Less than 50% are felons	820	83.8	16.2	92.1	7.9	95.4	4.6	99.6	0.4	99.5	0.5
Conviction Status											
50% or more are un-convicted	2,111	75.7	24.3	89.1	10.9	94.4	5.6	99.0	1.0	99.0	1.0
Less than 50% are un-convicted	735	82.7	17.3	93.3	6.7	95.9	4.1	99.7	0.3	99.6	0.4

Note: ADP is the total number of incarcerated individuals in jail each day for a year, divided by the number of days in the year.
Source: BJS, Mortality in Correctional Institutions, 2019; COJ, 2019.

However, this distribution varied by Annual Daily Population (ADP). Larger jails are more likely than smaller jails to report having at least one death, and this held true for all manners of death (i.e., suicide, intoxication, homicide; Figure 28).

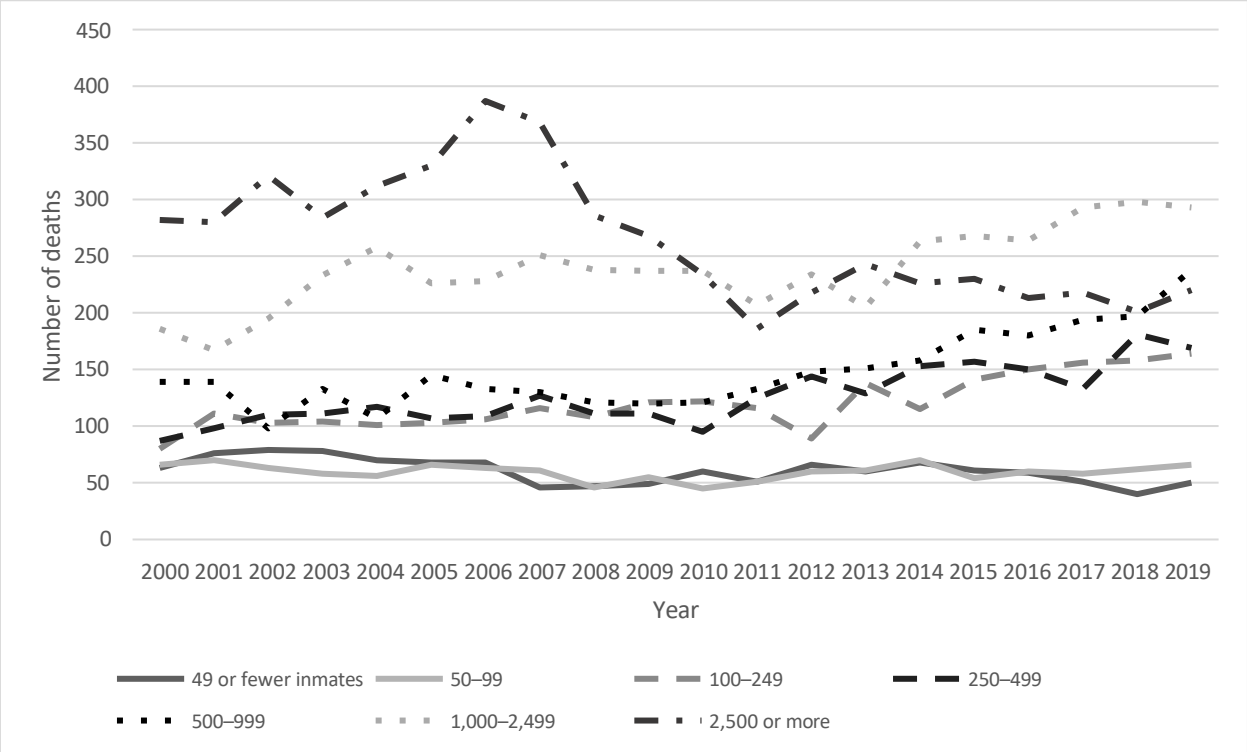
Figure 28. *Percentage of jail jurisdictions with one or more death, by ADP: 2006, 2013, 2019*



Source: BJS, Mortality in Correctional Institutions, 2006, 2013, 2019; COJ, 2006, 2013, 2019.

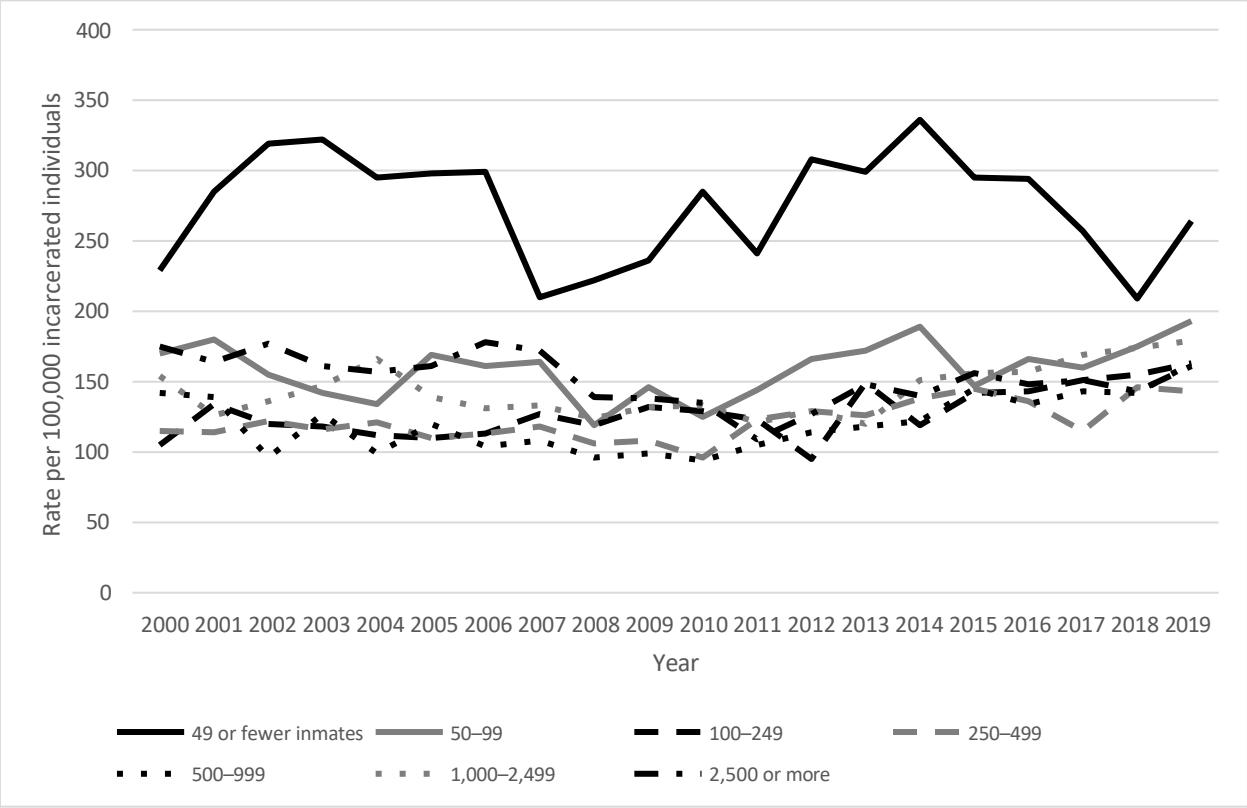
Although large jails are more likely than smaller jails to have deaths because of their larger population size, the mortality rate is much greater for smaller jurisdictions (Figure 29, Figure 30). Between 2000 and 2019, jurisdictions with population sizes of 1,000 or more accounted for the largest number of deaths. However, once the size of the jail jurisdiction is accounted for, the mortality rate is significantly higher for jails holding 49 or fewer incarcerated individuals.

Figure 29. *Number of jails deaths, by jurisdiction size: 2000–2019*



Source: BJS, Mortality in Correctional Institutions, 2000–2019.

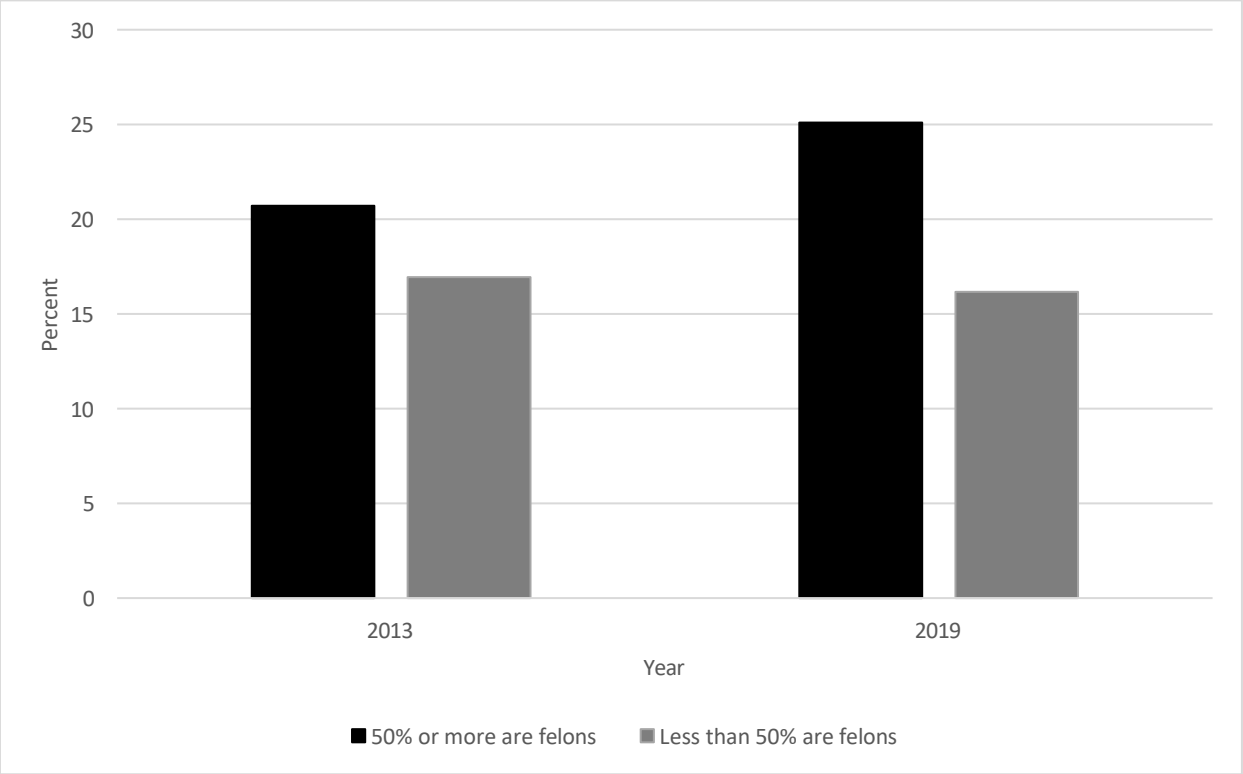
Figure 30. *Mortality rate per 100,000 incarcerated individuals, by jurisdiction size: 2000–2019*



Source: BJS, Mortality in Correctional Institutions, 2000–2019.

In both 2013 and 2019, the percentage of jails reporting one or more deaths was higher for facilities where at least half of the population was incarcerated for a felony. For example, in 2019, 25% of jails with at least 50% of the population incarcerated for a felony offense reported one or more deaths compared with 16% for those jails with fewer than 50% of the population. For facilities where fewer than half of the population were felons, the share of those reporting at least one death was essentially the same in 2013 and 2019. For facilities where 50% or more the population were incarcerated for a felony, the share reporting at least one death increased between 2013 and 2019 by about 21%.

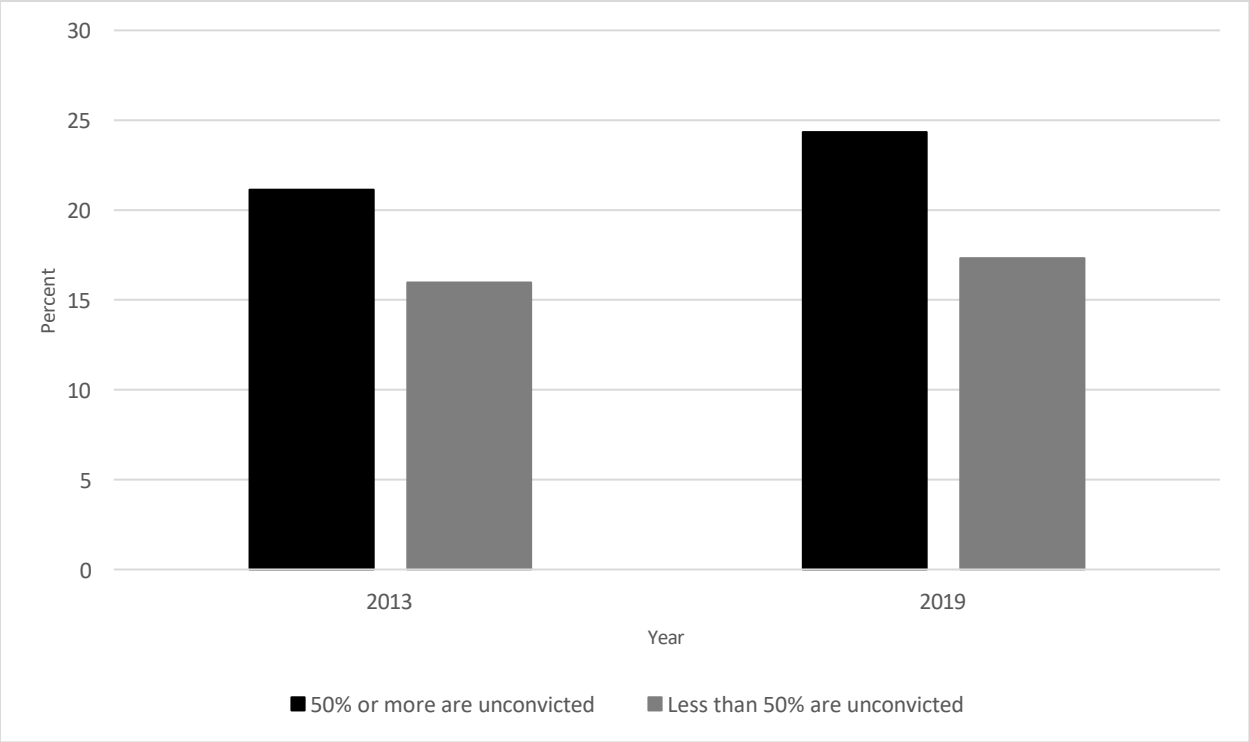
Figure 31. *Percentage of jails with one or more deaths, by percentage of jail population who committed a felony: 2013, 2019*



Source: BJS, Mortality in Correctional Institutions, 2013, 2019; COJ, 2013, 2019.

Likewise, the percentage of jails reporting one death or more differed for facilities where more or less of the population was convicted. For example, in 2019, 24% of jails with at least 50% of the population who were unconvicted had at least one death, compared with 17% for those jails where fewer than 50% of individuals were unconvicted.

Figure 32. *Percentage of jails with one or more deaths, by percentage of jail population conviction status: 2013, 2019*



Source: BJS, Mortality in Correctional Institutions, 2013, 2019; COJ, 2013, 2019.

Jail facility characteristics varied by the operator, purpose, and functions, and differences in these factors were related to having different rates of in-custody deaths (Table 2). City-operated jails were less likely than county-operated jails to have a death. About 85% of city jails reported zero deaths in 2019 compared with 77% of county jails. Although much fewer in number, both regional and private jails were more likely than city and county jails to have at least one death and to have multiple deaths in 2019.

Jails may differ in their purposes. They may serve as a detention facility to hold individuals for up to 72 hours, as a correctional facility to hold individuals who have been convicted and sentenced to up to 1 year or as a correctional facility to hold individuals who have been convicted and sentenced to more than 1 year. Most jail jurisdictions can hold individuals up to 1 year. Jails holding individuals for up to 72 hours or up to 1 year were both less likely to report a death in 2019 than those holding individuals who have been convicted and sentenced to more than 1 year. This pattern held for all deaths, including for suicide and intoxication-related deaths specifically.

Table 2. *Percentage of jails with zero, one or multiple deaths, by operator, sex, purpose, and capacity: 2019*

Characteristic	No. of Jails	All Deaths		Suicide		Intoxication		Homicide		Accident	
		0	1+	0	1+	0	1+	0	1+	0	1+
Total	3,116	77.0	23.0	90.2	9.8	94.8	5.2	99.2	0.8	99.2	0.8
Jail Operator											
County	2,693	76.7	23.3	90.4	9.6	94.6	5.4	99.1	0.9	99.1	0.9
City	310	84.7	15.3	93.1	6.9	96.0	4.0	99.3	0.7	99.0	1.0
Regional	79	62.6	37.4	89.3	10.7	89.3	10.7	98.7	1.3	98.5	1.5
Private	34	65.8	34.2	87.7	12.3	91.1	8.9	100.0	0.0	97.0	3.0
Inmate Sex											
Both	2,763	76.8	23.2	90.3	9.7	94.7	5.3	99.1	0.9	99.2	0.8
Female-Only	10	70.2	29.8	90.5	9.5	100.0	0.0	100.0	0.0	100.0	0.0
Male-Only	276	81.8	18.2	95.0	5.0	94.3	5.7	99.3	0.7	99.6	0.4
Jail Purpose											
Up to 72 hours	1,659	78.9	21.1	91.2	8.8	95.1	4.9	99.1	0.9	99.4	0.6
More than 72 hours	2,864	76.9	23.1	90.6	9.4	94.5	5.5	99.1	0.9	99.3	0.7
More than 1 year	1,027	69.6	30.4	87.9	12.1	91.9	8.1	98.9	1.1	99.0	1.0
Capacity											
Jail facilities operating at 100% capacity or less	2,644	78.9	21.1	91.3	8.7	95.3	4.7	99.3	0.7	99.1	0.9
Jail facilities operating at more than 100% capacity	472	66.2	33.8	86.5	13.5	90.4	9.6	98.3	1.7	98.5	1.5

Source: BJS, Mortality in Correctional Institutions, 2019; COJ, 2019.

Jails operating at more than their rated 100% capacity were more likely to report at least one death in 2019 (Table 2). This pattern also held true for suicide and intoxication deaths.

Table 3. *Percentage of jails with zero, one, or multiple deaths, by function: 2019*

Characteristic	No. of Jails	All Deaths		Suicide		Intoxication		Homicide		Accident	
		0	1+	0	1+	0	1+	0	1+	0	1+
Total	3,116	77.0	23.0	90.2	9.8	94.8	5.2	99.2	0.8	99.2	0.8
Jail Function											
General adult confinement	3,032	77.2	22.8	90.7	9.3	94.6	5.4	99.1	0.9	99.3	0.7
Persons returned to custody	2,897	76.7	23.3	90.4	9.6	94.5	5.5	99.2	0.8	99.3	0.7
Work release/prerelease	1,603	76.4	23.6	91.3	8.7	94.4	5.6	99.2	0.8	99.2	0.8
Reception/diagnosis/ classification	1,627	73.3	26.7	88.3	11.7	93.5	6.5	99.0	1.0	99.2	0.8
Juvenile confinement	339	62.0	38.0	82.9	17.1	89.1	10.9	97.1	2.9	98.2	1.8

Medical treatment/ hospitalization	655	60.8	39.2	82.8	17.2	87.3	12.7	98.4	1,6	98.4	1.6
Mental health/ psychiatric care	794	62.5	37.5	83.5	16.5	89.1	10.9	98.2	1.8	98.6	1.4
Alcohol treatment	472	60.4	39.6	85.0	15.0	88.5	11.5	98.1	1.9	98.5	1.5
Drug treatment	513	61.0	39.0	84.5	15.5	88.5	11.5	98.0	2.0	98.6	1.4
Boot camp	9	32.2	67.8	77.8	22.2	77.0	23.0	89.5	10.5	100.0	0.0
Protective custody	1,152	66.4	33.6	86.0	14.0	90.5	9.5	98.2	1.8	98.5	1.5

Source: BJS, Mortality in Correctional Institutions, 2019; COJ, 2019.

The function of jail facilities varies widely and may be multifaceted. For example, most jails function as a general adult confinement but also provide work release/prerelease programs; juvenile confinement; and medical, mental, and substance use treatment (Table 3). Jails with medical, mental health, drug, or alcohol treatment functions were more likely to report a death than the percentage at jails generally.

Change Over Time

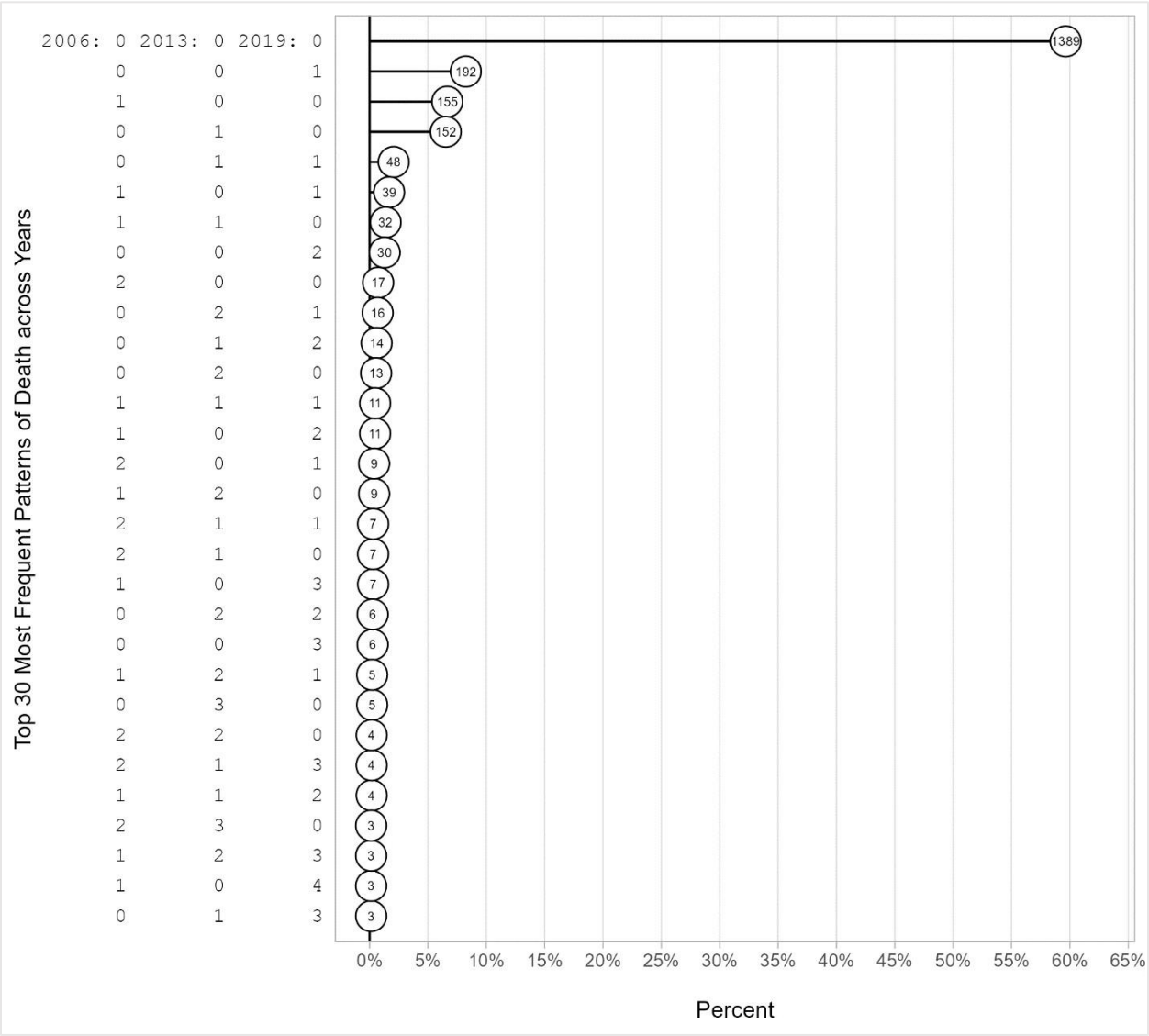
An important issue is the consistency or change in deaths occurring in jails over time. For example, if a jail reports a death in 1 year, is it likely to report a death in another year? To examine the patterns of deaths over time, jails were selected if they participated in the COJ survey collection for the 3 available years (2006, 2013, 2019). As described previously, jail jurisdictions were matched across the 3 periods and then decedent information was matched to each jurisdiction. Linking over the 3 periods resulted in 2,329 unique jurisdictions.

Figure 33 shows the top 30 most frequent patterns of death reporting across the 3 years examined. The vertical axis represents the number of deaths reported for each of the 3 years examined. The horizontal axis represents the percentage of jails. The numbers in each circle are the total number of jails in each pattern. For example, the top bar is the most common reporting pattern and represents jails that reported zero deaths for all 3 years (2006, 2013, and 2019). This pattern accounted for a total of 1,389 jails or about 60% of all jails. Moving down the figure, the second most common pattern of death was to report a single death in 1 year and zero deaths in the other 2 years. For example, 8% or 192 jails reported zero deaths in 2006 and 2013 and 1 death in 2019. Likewise, the third most common pattern, accounting for 7% of jails, was reporting one death in 2006 and zero deaths in both 2013 and 2019. Very few facilities reported a death across all 3 years and even fewer reported multiple deaths within each year (Figure 33). For example, the 13th most common pattern, accounting for 11 (0.5%) jails, was reporting one death in each of the 3 years examined.

The rarity of having a consistent pattern of deaths becomes more glaring when deaths are considered by subset. Like the total death pattern, most jails reported zero suicides and intoxication deaths across all 3 periods (not shown). For example, approximately 77% of all jails or 1,470 jails reported zero suicides in 2006, 2013, and 2019. Like total deaths, the next most frequent pattern was having one death in one year, but zero in the other 2 years. For example,

113 or 6% of all jails reported one suicide in 2019 but zero suicides in 2006 and 2013. Given the extremely rare nature of homicide and accidental deaths each year (approximately a total of 25 per year), identifying longitudinal patterns over time was not possible. Most jails (95% or more) reported zero homicide or accidental deaths for each of the 3 years examined.

Figure 33. *Most frequent pattern of all deaths: 2006, 2013, 2019*



Note: The vertical axis represents the number of deaths reported by jails for each year. The horizontal axis represents the percentage of jails and the numbers in the circles represent the number of jails in each pattern. For example, the top bar represents jails that reported zero deaths for all 3 years (2006, 2013, and 2019). This pattern accounted for a total of 1,389 jails or about 60% of all jails.
Source: BJS, Mortality in Correctional Institutions, 2006, 2013, 2019; COJ, 2006, 2013, 2019.

Multivariable Analysis

Next, we examine associations of facility characteristics with the mortality rate, accounting for the community characteristics. Many of the descriptive associations discussed to this point have not considered the possibility that the relationship may be driven by another underlying community or facility factor.

We used negative binomial regressions to examine the relationship between the number of deaths by each manner of death for 2013 and 2019 with jail characteristics. We used the population as an offset to account for the size of the population and year to control for change over time. We examine the association of several facility factors such as ADP, percentage of the jail population with a felony status, percentage with unconvicted status, the ratio of incarcerated individuals to correctional staff, the ratio of incarcerated individuals to total staff, the average daily admissions rate, and race/ethnic distributions.

The results show very few facility factors are statistically associated with the rate of each manner of death (Table 4). For all deaths and for deaths by suicide, the average daily population was negatively associated with more deaths. This is consistent with the descriptive mortality rate discussed earlier, indicating that smaller jails have a higher mortality rate. Other than ADP, very few consistent patterns emerge across or within manner of death.

Table 4. *Association of facility and population characteristics on jail deaths, by manner of death: 2013, 2019*

	All Deaths			Suicide			Intoxication			Homicide			Accident		
Coefficient	**Estimate**	**SE**	**Sig.**	**Estimate**	**SE**	**Sig.**	**Estimate**	**SE**	**Sig.**	**Estimate**	**SE**	**Sig.**	**Estimate**	**SE**	**Sig.**
(Intercept)	−4.04	4.32		−9.33	6.59		−19.71	14.83		−8.78	20.91		4.78	14.58	
YEAR 2019	0.09	0.10		−0.26	0.14		1.02	0.31	**	0.27	0.41		−0.13	0.35	
Facility characteristics															
ADP cat 2[a]	−0.39	0.12	**	−0.45	0.19	*	−0.69	0.49		−0.63	0.85		0.70	0.63	
ADP cat 3	−0.47	0.12	***	−0.66	0.18	***	−0.37	0.42		−0.14	0.69		0.50	0.61	
ADP cat 4	−1.13	0.13	***	−1.16	0.19	***	−0.45	0.42		−0.04	0.68		0.45	0.62	
% Felony	−0.03	0.08		-0.06	0.12		0.13	0.24		−0.31	0.36		0.09	0.29	
% Unconvicted	−0.15	0.08		-0.24	0.13		0.02	0.26		−0.73	0.45		−0.50	0.35	
Inmate: Correctional staff	0.02	0.03		0.04	0.03		0.05	0.07		0.06	0.09		−0.13	0.12	
Inmate: Total staff	−0.20	0.19		−0.29	0.26		−0.52	0.57		−0.35	0.69		0.65	0.62	
Admission rate	0.00	0.00	*	0.00	0.00		0.00	0.00		0.00	0.00		0.00	0.00	
Population characteristics															
% Female	0.01	0.03		0.02	0.04		0.10	0.09		0.25	0.17		0.11	0.10	
% Black[b]	0.00	0.00		0.01	0.01		−0.02	0.01	*	−0.01	0.02		0.00	0.01	
% American Indian	−0.01	0.01		0.00	0.02		0.01	0.03		0.01	0.03		−0.06	0.09	
% Asian	−0.03	0.01	*	−0.02	0.02		-0.04	0.03		0.03	0.03		0.02	0.03	
% Pacific Islander	0.24	0.17		0.53	0.21	*	0.66	0.35		0.93	0.46	*	−0.27	0.75	
% Other race	0.00	0.01		0.01	0.02		0.01	0.04		0.03	0.04		−0.01	0.04	
% Multi race	0.03	0.03		0.03	0.04		0.04	0.08		−0.08	0.13		0.11	0.11	
% Hispanic	0.00	0.00		0.01	0.01		−0.01	0.01		0.00	0.02		0.00	0.01	
% Ages 10–17[c]	−0.11	0.07		−0.01	0.11		−0.04	0.25		−0.08	0.34		−0.58	0.25	*
% Ages 18–24	−0.05	0.03		−0.01	0.05		0.03	0.12		−0.05	0.16		−0.26	0.12	*
% Ages 25–34	−0.07	0.05		0.07	0.07		0.09	0.16		−0.12	0.23		−0.28	0.17	
% Ages 35–54	−0.07	0.04		−0.06	0.06		0.06	0.12		−0.02	0.18		−0.20	0.13	
% Ages 55–64	0.01	0.05		0.12	0.07		0.01	0.16		0.18	0.24		−0.27	0.19	
% Ages 65+	−0.06	0.04		−0.01	0.05		0.01	0.12		−0.21	0.18		−0.24	0.13	
Income to poverty ratio: .5–.99[d]	0.01	0.04		−0.04	0.06		0.07	0.13		−0.23	0.18		−0.05	0.14	
Income to poverty ratio: 1–1.24	−0.03	0.05		−0.07	0.07		−0.10	0.16		0.08	0.22		0.35	0.15	*
Income to poverty ratio: 1.25–1.49	0.01	0.04		−0.03	0.07		−0.03	0.15		−0.29	0.22		0.19	0.14	
Income to poverty ratio: 1.5–1.84	0.03	0.04		0.02	0.06		0.12	0.13		−0.09	0.19		−0.07	0.14	

	All Deaths			Suicide			Intoxication			Homicide			Accident		
Coefficient	**Estimate**	**SE**	**Sig.**	**Estimate**	**SE**	**Sig.**	**Estimate**	**SE**	**Sig.**	**Estimate**	**SE**	**Sig.**	**Estimate**	**SE**	**Sig.**
Income to poverty ratio: 1.85–1.99	−0.04	0.06		−0.04	0.09		0.01	0.19		−0.01	0.28		−0.09	0.22	
Income to poverty ratio: 1.99+	0.01	0.02		0.00	0.04		0.01	0.08		−0.13	0.11		0.01	0.08	

Note: *** p < 0.001 ** p < 0.01 * p < 0.05. Estimate = coefficient; SE = standard error; sig = significance. [a] Reference category is lowest average daily population (49 or fewer). [b] Reference category is percentage of jurisdiction who are White. [c] Reference category is the percentage of jurisdiction who are less than 9 years old. [d] Reference category is population for whom the ratio of income to poverty level is under 0.5.

Summary of the Agency and Community Characteristics Associated with Deaths in Jail Custody

- Most jails did not report a death during the 3 years examined. However, the percentage of jails reporting one or more deaths increased steadily over the 3 examined years, up to 23% in 2019 from a low of 14.5% in 2000.
- In 2019, 90% of jails reported zero suicides, 95% reported zero intoxication deaths, and 99% reported zero homicides or accidents.
- Jails that did report a death during one of the examined years were not likely to report an additional death in the other years. A very small percentage of jails had multiple deaths each year, and this appears to have been driven primarily by jail size.
- The most significant factor related to jail deaths was the average daily population. Large jails had more deaths, but small jails with average daily populations of 49 or fewer persons had the highest mortality rate.
- Jails operating at greater than their rated 100% capacity were more likely to report at least one death and to have multiple deaths in 2019. This pattern also held true for suicide and intoxication deaths.

Review of the Literature on Policies and Practices Designed to Reduce Mortality in Jails

The following sections delve into each type of death categorized by the MCI collection, the factors that are potentially related to the cause of death, and management policies and practices that may affect the cause. Suicides, deaths caused by intoxication and overdose, and deaths caused by illnesses or other natural causes make up the bulk of jail deaths and are also the focus of most current literature surrounding mortality in jails. Policies and practices related to deaths in jail because of homicide or accidents are much more limited and warrant further research.

Suicide in Jails

Suicide is the second leading manner of death among individuals incarcerated in jail, accounting for nearly 30% of all jail deaths in 2019 (Carson, 2021a, 2021b). Of all recorded manners of death in jails, suicide is the only manner for which the rate of death is higher than that of the general U.S. population when adjusted for differences in age, sex, and race/ethnicity (Table 5).[11] The overall death rate (from all manners of death) among individuals in jail was less than half that of the typical U.S. resident (154 per 100,000 incarcerated individuals vs. 339 per

[11] "The jail population differs substantially from the U.S. resident population in terms of age, race or ethnicity, and sex distributions. These differences preclude direct comparison of mortality rates between jail inmates and U.S. residents. To allow for direct comparisons, BJS adjusted the U.S. resident population's mortality rates to the age-by-sex-by-race/ethnicity distribution of jails in 2019" (Carson, 2021a).

100,000 U.S. residents).[12] However, for suicides, the rate for individuals in jail was more than double that of the typical U.S. resident (48 per 100,000 incarcerated individuals vs. 22 per 100,000 U.S. residents) (Carson 2021a).

Table 5. *Adjusted mortality rates per 100,000 U.S. residents and individuals incarcerated in jails, by cause of death, 2019*

Cause of Death	Adjusted Rate per 100,000 Adult U.S. Residents	Rate per 100,000 Incarcerated Individuals
All Causes	339	154
Illness	262	75
Suicide	22	48
Drug/Alcohol Intoxication	41	25
Accident	9	3
Homicide	4	3

Source: Carson (2021a).

From 2000 to 2019, White individuals accounted for approximately 72% of all jail suicides, followed by Black individuals (13%) and Hispanic individuals (12%). Males accounted for more than 90% of all suicide deaths (Carson, 2021b). One study that looked at 511 incarcerated individuals in a mixed-gender jail sample found that suicide ideation was significantly higher among White individuals, those with a history of attempted suicide, and individuals with a psychiatric diagnosis history (Schaefer et al., 2016). The suicide rate among individuals in jail increased with age. Although older individuals—those 55 or older—accounted for only about 6% of suicides, the rate at which they died by suicide was higher than any other age group: 79 deaths per 100,000 (Carson, 2021b).

The *Wall Street Journal* collected data on suicides in jails and prisons that, like statistics reported by BJS, show an increase in suicide in recent years. The study further found that the increase in suicides in jails and prisons was driven in part by COVID-19 and the increased isolation of individuals during the pandemic as they spent more time confined to their cells and had fewer visits with family members. More drug use and a shortage of corrections officers also contributed to the increase (Maher & Frosch, 2022).

Characteristics associated with suicides

Incarcerated individuals who died by suicide were more likely to be

- White
- Male
- Older
- Incarcerated for violent offenses
- Housed in single-person or segregation cells

BJS found that the largest proportion of suicides occurred in the afternoon between noon and 6 p.m. (28%) and in the evening between 6 p.m. and midnight (27%) hours; most occurred in an

[12] The rate of 154 per 100,000 incarcerated individuals is different than the previously cited 167 per 100,000 incarcerated individuals because of "the removal of local jail inmates age 17 or younger from both the numerator (deaths) and the denominator (local jail population) and the exclusion of deaths for which the cause of death was unknown or missing" (Carson, 2021b, p11).

individual's cell or room (73%). Nearly two-thirds (65%) of jail suicides occurred during the first 30 days of a person's incarceration and nearly half (47%) occurred during the first week. From 2010–2019, suffocation, including hanging and self-strangulation, caused about 9 out of 10 suicide deaths in local jails (Carson, 2021a). There have also been some associations found between heat waves and suicide ideation and attempts (Cloud et al., 2023; Skarha et al., 2023).

A study from Dixon et al. (2020) had similar findings as BJS related to the method and timing of suicides. From 2003 to 2014, the study found that most individuals who committed suicide died by hanging and within 1 week of incarceration, with the largest proportion occurring between noon and 6 p.m. Suicides appeared to occur disproportionately among individuals housed in single-person or segregation units.[13] Incarcerated individuals who committed suicide were significantly less likely than suicide decedents in the general U.S. population to have a previous diagnosis of mental health problems overall—including depression, current depressed mood, and alcohol problems. However, individuals who committed suicide while incarcerated were significantly more likely to have been diagnosed with schizophrenia, an unspecified mental health problem, or a substance use disorder. These individuals were also less likely to be currently receiving or have ever received mental health or substance use disorder treatment, have a known history of suicidal thoughts, leave a suicide note, or disclose suicidal intent than individuals who committed suicide outside of a correctional setting. Cain and Ellison (2024) found that those who experienced mental health issues, drug dependence, victimization in jail, and psychological distress were more likely to attempt self-harm or suicide.

A study by Folk and colleagues (2018) compared incarcerated individuals who attempted suicide to those who died by suicide and their findings suggest deaths by suicide are less likely to occur when mental health staff are aware of individuals' current and historical risk factors (Table 6). Among the diagnostic factors explored, individuals diagnosed with borderline personality disorder were more likely to attempt suicide but less likely to die of suicide than individuals without a borderline personality disorder diagnosis. Among the five treatment factors examined, those who were not prescribed psychotropic medication or were noted by staff as not compliant with psychotropic medication were more likely to die by suicide. Individuals who were not receiving mental health treatment were more likely to die by suicide than those who were receiving treatment. Those who attempted suicide differed from those who died by suicide on all eight concurrent risk factors. Individuals who had a recent decline in physical health were more likely to die by suicide than to attempt suicide. Finally, individuals with a documented history of substance use problems, impulsivity, suicide/self-injurious behavior, trauma, and participation in psychological treatment were more likely to die by suicide than to attempt suicide.

[13] Segregation units house incarcerated individuals separately from the general population. They are generally used for disciplinary purposes or administrative purposes. Administrative segregation is used when housing the individual in general population would cause significant disruptions or safety concerns for the jail as a whole.

Table 6. *Differences between incarcerated individual suicide attempts and suicide deaths, by factor*

Diagnostic Factors	Treatment Factors	Concurrent Risk Factors	Proximal Factors	Historical Factors
Psychotic Disorder	Mental Health Caseload*	Agitation*	Self-Injurious Behaviors*	Substance Use Problem*
Mood Disorder	Psychotropic Medication*	Hopelessness*	Decline in Physical Health*	Impulsivity*
Anxiety Disorder	Compliant with Medication*	Psychotic Turmoil*	Conflict with Inmates*	Suicide/Self-Injurious Behavior*
Substance Use Disorder	Change in Medication	Alienation*	Recent Bad News	*Trauma*
Antisocial Personality Disorder	Active Substance Use or Withdrawal	Depressive Symptoms*	Sudden Stressor	Psychological Treatment*
Borderline Personality Disorder*		Psychotic Symptoms*		Family History of Suicide
		Suicide Plan Identified*		
		Sudden Change in Mental Status*		

*Differences between non-lethal suicide attempts and suicide deaths (Folk et al., 2018).

Kaba and colleagues (2015) analyzed 3 years of medical records of individuals in New York City jails and found that 53% of acts of self-harm and 45% of acts of fatal self-harm occurred in segregation units. Individuals who committed acts of self-harm were significantly more likely to have been held in solitary confinement at least once, have a serious mental illness, be aged 18 years or younger, and be Latino or White, regardless of sex.

Little is known about factors that contribute to suicide completion among incarcerated women. One such study examined 176 suicide deaths among women incarcerated in jails or prisons between 2003 to 2015 (Mennicke et al., 2021). The average age at suicide was 34 years, and the majority were non-Hispanic White. Most deaths occurred by hanging. About 20% of incarcerated females who committed suicide had used alcohol shortly before their death while 12% tested positive for opiates. Mental health and substance use problems were common circumstances for suicide completion, and women experienced these problems at higher rates than males who committed suicide. Incarcerated women who committed suicide were also more likely to have experienced violence in the month preceding their death and to have a history of abuse or neglect than males who committed suicide.

DeCou et al. (2016) examined the association between childhood sexual abuse and the onset of attempted suicide across the life span among women in jail. They found that women with histories of childhood sexual abuse were significantly more likely to have attempted suicide during their lifetimes, including increased risk for the onset of attempted suicide in adulthood,

indicating that childhood sexual abuse may be an important predictor of suicidal behavior among women in jail. In addition, symptoms of mental illness were also found to be a predictor of suicide attempt. These findings suggest that it is critically important for correctional facilities to assess history of childhood sexual abuse and the presence of symptoms of mental illness to identify suicide risk and to assist in suicide prevention efforts.

Policies and Practices to Mitigate Suicide in Jails

Numerous architectural and environmental safeguards are available to mitigate suicide risk. For example, "anti-suicide" products such as safety smocks and blankets; "suicide-resistant" cells with tamper-proof light fixtures, fiberglass-molded bunks with rounded edges, and no tie-off points; frequent checks on individuals; and closed-circuit television monitoring of cells are all productive measures to protect incarcerated individuals against suicide. Emerging technologies include vital sign sensors that can be either worn by confined individuals or placed on a wall or other fixed structure near individuals. Other technology can serve as confirmation that correctional officers have completed checks on cells or individuals at required intervals, which is critical to enhance the safety of individuals who have been determined to be a risk to themselves. Technology that can screen individual communications (e.g., phone calls, video visits) for indication of stress or suicidal intentions may be effective for early intervention. For example, one California jail has implemented software that identifies when individuals use certain language in their recorded phone calls that is indicative of suicide risk. The software flags when key phrases such as "kill myself" or "can't go on" are used in telephone conversations, and staff are alerted via text message (Chadwell, 2022). Following the alert, jail staff are able to follow up with the individual and bring in a mental health professional for further evaluation if necessary. Another jail system in Georgia provided vital sign monitoring bracelets to individuals deemed at high risk of suicide with the goal of staff being able to intervene during critical moments (Associated Press, 2022). When coupled with a process to assess and intervene with the individual in crisis, these types of technologies could serve as valuable early warning systems and safeguards that may reduce deaths by suicide in jails.

Screening individuals at intake and throughout their period of confinement can help identify individuals who may require mental health treatment or be at risk of suicide (Hayes, 2012). Cramer et al. (2022) developed a Self-Injury Risk Assessment Protocol for Corrections (SIRAP-C) that has shown promising results. This risk assessment tool is something that should be further studied as a potential screening tool for facilities. For individuals with mental illness, jail incarceration can be a major stressor linked with heightened risk for suicide, not only in jail but after an individual returns to the community. Some programs, like the Safety Planning Intervention being implemented in the Suicide Prevention Intervention for at-Risk Individuals in Transition (SPIRIT) study, attempt to reduce this risk among individuals being held in jail pre-trial (Johnson et al., 2020). The SPIRIT study brings community mental health counselors into jails to conduct a suicide risk reduction plan for individuals being held in pre-trial confinement who are at risk of suicide. Although the program is specifically geared at reducing risk of suicide within the year after individuals leave jail, aspects of the program, such as bringing counselors from community mental health services into the jail, may also serve to reduce suicide risk while incarcerated.

Selected actions taken by one jail to reduce individual risk of suicide:

- Developed a joint training between the medical services division and the in-service training unit to customize an existing training on suicide detection and prevention in jail and prison facilities for all employees within the jail system.
- Developed a 2-hour annual suicide prevention curriculum that includes a general discussion of recent suicides or serious suicide attempts at the facility.
- Revised the suicide risk inquiry in the Medical Intake Questions.
- Updated policy to require a charge nurse or a mental health clinician to be the Inmate Safety Program (ISP) gatekeeper. If a charge nurse is gatekeeper, they should be required to notify a mental health clinical when an individual has been identified as suicidal to conduct the risk assessment.
- Initiated quality assurance plan to include periodic audits of intake screening process.
- Conducted a physical review of housing facilities to ensure suicidal resistance of rooms used for housing suicidal individuals.
- Reduced maximum length of stay in a safety cell to no more than 6 hours. Create guidelines on when the cells should be used to prevent them from being overused.
- Updated narrative language so that "twice every thirty minutes" is replaced with "staggered intervals that do not exceed ten to fifteen minutes."
- Made reasonable efforts, particularly when considering discharge from suicide precautions, to avoid cell-side encounters. Made assessments in a private and confidential setting.
- Had Critical Incident Review Board or Suicide Prevention and Focused Response team conduct mortality and morbidity reviews of any suicide or suicide attempts.
- Revised responsibility statement to "track all incidents of self-harm and attempted suicides; revise all serious attempts and suicides."

Not all jails implement similar levels of screening. A study of 3,797 individuals who had been incarcerated in rural and non-rural jails found that those who were booked into rural jails were more likely to have a mental illness but less likely to have this mental illness identified by staff (Nelson et al., 2023). A 2012 survey of Texas jails found that all but two of the 32 jails that responded screened for suicidal ideation and whether an individual took medication (Becker, 2016). Almost all offered suicide prevention programs and services to incarcerated individuals and most offered crisis intervention, provided psychiatric medications, and offered in-house psychiatric care. About half the responding jails offered in-house care, and the other half referred individuals to the local mental health authority. About two-thirds of the jails had a formal jail diversion program, and most thought that mental illness was increasing. About half had an annual 4-hour training program for staff that included training on psychiatric symptoms and behaviors, crisis intervention, custodial and community options, and the values and attitudes of persons with mental illness.

Incarcerated individuals need access to mental health professionals who can help to identify and protect against risk for self-harm, although staffing and other resource priorities may make access to mental health professionals a challenge for many jails. Some selected counties and jails have stood out in their efforts to locate and reduce suicide attempts. For example, Brittain and colleagues (2013) reviewed New York City (NYC) jail system deaths between 2001 and 2009 and found that they have lower rates of suicide than the national jail average. Medical care in

NYC jails is provided by the Correctional Health Services (CHS) bureau of the NYC Department of Health and Mental Hygiene. CHS staff provide suicide awareness and prevention training to all NYC Department of Corrections (DOC) staff during their cadet training. The CHS and DOC have rigorous suicide policies that include referring any patients in distress to the CHS and ensuring patients on suicide watch are tracked closely during facilities transfers and handoffs (Brittain et al., 2013).

NYC also took the step of redesigning the units they use to house individuals with mental health issues. Ford and colleagues (2020) evaluated NYC's first Program for Accelerating Clinical Effectiveness (PACE) units, which are designed to provide better treatment and safety by including larger, open spaces, confidential interview rooms, adequate space for group activities, and as much natural light as possible. They found that the units reduced the impact of isolation, reduced injuries caused by violence, and improved adherence to medications. Specifically, PACE patients had lower rates of self-injury and fewer injuries because of fights at 30 and 60 days than patients with similar characteristics who were not placed in PACE units. In addition, mean adherence to psychiatric medication over 30 days was higher among PACE patients than among those not in PACE units (77% vs. 55%).

Although segregation or isolation measures may be necessary at times, the data on suicide in custody indicate that the use should be consistently assessed and used sparingly. The Hampden County Jail and House of Corrections in Massachusetts began to reform its policies around their use of segregation units in 2008. The policy changes included reducing the maximum number of days allowed in segregation down to 30 and, for those who do get sent to segregation, creating a treatment plan with them to help reduce the likelihood of psychological stress. A study conducted by Olive (2017) found that these policies led to a 48% reduction in the population being housed in segregation while resulting in no difference among the rates of violence between incarcerated individuals, incarcerated individual-on-staff violence, use of force, or suicidal behaviors. This suggests that jails can reduce the harmful conditions of segregation without increases in violence among the general population (Olive, 2017). Haye's (2018) recommendation for a western U.S. jail system also suggests reassessing daily the necessity of segregation, isolation, or use of bodily restraints.

Jails may implement a mortality review process of "every completed suicide, as well as attempts that require hospitalization" (Hayes, 2012) to examine and inform policies and practices designed to prevent suicides. According to Hayes (2012), components of a comprehensive jail suicide prevention program should include:

> Training of all correctional, medical, and mental health staff on both an initial and annual basis; intake and ongoing screening/assessment for suicide risk; procedures that encourage communication between outside entities and correctional facilities, as well as internally between and among facility staff and the suicidal individual; suicide-resistant housing and restrictions (e.g., clothing, showers, telephone calls, visiting, etc.) commensurate with risk level; procedures for emergency response to a suicide attempt; reporting and notification of a suicide to the facility's chain of command and family of

> suicide victim; and multidisciplinary examination of the suicide through a mortality review. (Hayes, 2012)

Hayes' survey of jail administrators found that 85% of jail facilities that experienced a suicide had a written suicide prevention policy, yet most plans did not encompass all components of a comprehensive suicide prevention program.

A Consensus Workgroup of 12 organizations has also developed recommendations designed to address the issues at the intersection of behavioral health and the criminal justice system, including the issues associated with individuals with mental illness and substance use disorders in jails (Consensus Workgroup, n.d.). For jails specifically, those recommendations include providing support to jails for mental health care during incarceration and planning for care after reentry as well as the implementation of suicide risk assessment tools, policies, and services for individuals at risk (Consensus Workgroup, n.d.).

Substance Use and Overdoses in Jails

In 2000, drug/alcohol intoxication accounted for approximately 4% of deaths in jails (a rate of 6 per 100,000 jailed persons) but rose significantly to account for approximately 15% of all deaths (and a rate of 26 deaths per 100,000 jailed persons) in 2019. This more than quadruples the mortality rate (Carson, 2021a).

Though men accounted for a larger share of deaths because of drug/alcohol intoxication (78% of intoxication deaths from 2000–2019), women died at a rate nearly double that of men, with 20 intoxication deaths per 100,000 for women as opposed to 11 intoxication deaths per 100,000 jailed persons for men (Carson, 2021a). White persons died from overdoses at higher rates than any other race/ethnicity (21 deaths per 100,000 jailed persons), and those jailed for drug or other public order offenses had the highest overdose death rates (14 per 100,000 jailed persons for both offense types). Intoxication deaths, by significant margins, occurred the soonest after initial incarceration, with a median time served of only 1 day (compared with 9 days for suicide deaths and 33 days for natural or illness deaths) (Carson 2021a). Crick et al. (2023) found that there is a significant relationship among inmates who are exposed to adverse childhood experiences and having co-occurring disorders.

When an individual with a substance use disorder enters jail, they can experience dangerous, if not deadly, withdrawal symptoms (Fiscella et al., 2004; Kasser et al., 1998; Wilkins et al., 1998). Withdrawal can cause serious physical and mental distress (Kosten & O'Connor, 2003) and in some cases can even lead to death (Wilson, 2000). Individuals going through withdrawal are at heightened risk for suicide (Fiscella et al., 2004; Regier et al., 1990). Individuals who are incarcerated are also at higher risk for overdosing than the general population (Merrall et al., 2010).

Although medication-assisted treatment (MAT) is a well-researched and evidence-based way to treat opioid use disorder (OUD), only 3.6% of incarcerated individuals with OUD received buprenorphine, a medication used in MAT programs (Thakrar et al., 2021). A national survey found that only 22% of individuals incarcerated in jails who met the criteria for substance use

disorder or dependence received any kind of drug treatment, and only 2% of those individuals were provided withdrawal management services (Bronson et al., 2017).

Policies and Practices to Mitigate Substance Use and Overdoses in Jail

Guidelines for alcohol and drug detoxification have been established and promulgated by the American Psychiatric Association (APA), the American Society of Addiction Medicine (ASAM), and the National Consensus Development Panel (NCDP). Additionally, standards for the management of detoxing individuals in jails and prisons have been created by the NCCHC and the Federal Bureau of Prisons (BOP). Although the BOP's clinical guidance for detoxification is meant for prisons, much of the information it provides could be useful for jails. Screening tools can be helpful in identifying inmates dealing with substance use issues. One study found that 27% of jail intake forms did not ask any questions about substance use while less than 11% asked about the use of opioids (Bunting et al., 2023).

Table 7 lists substances and the associated withdrawal symptoms, as described by the Federal BOP in its detoxification guide. Table 8 shows different substances and the associated monitoring times needed, primary treatment, general severity of withdrawal, and if hospitalization is suggested.

Table 7. *Drug abuse and withdrawal symptoms*

Substance	Withdrawal Symptoms
CNS STIMULANTS Amphetamines; cocaine; methylphenidate; phenmetrazine; phenylpropanolamine; most anti-obesity drugs	Muscular aches; abdominal pain; chills, tremors; voracious hunger; anxiety; prolonged sleep; lack of energy; profound psychological depression, sometimes suicidal; exhaustion
CANNABIS GROUP Marijuana; hashish; THC6; hash oil	Nonspecific symptoms, including anorexia, nausea, insomnia, restlessness, irritability, anxiety
OPIOIDS heroin; morphine; codeine; meperidine; methadone; hydromorphone; opium; pentazocine; propoxyphene	Pupils dilated; pulse rapid; gooseflesh; abdominal cramps; muscle jerks; "flu" syndrome; vomiting, diarrhea; tremulousness; yawning; anxiety
CNS SEDATIVES Barbiturates; benzodiazepines; glutethimide; meprobamate; methaqualone	Tremulousness; insomnia; sweating; fever; clonic blink reflex; anxiety; cardiovascular collapse; agitation; delirium; hallucinations; disorientation; convulsions; shock
ANTICHOLINERGICS Atropine; belladonna; henbane; scopolamine; trihexyphenidyl; benztropine mesylate; procyclidine; propantheline bromide	Gastrointestinal and musculoskeletal symptoms
ALCOHOL	Gastrointestinal distress; anxiety; irritability; increased blood pressure; increased heart rate; insomnia; tremors; fever; anorexia; diaphoresis; seizures; delirium, which can result in

	changes in consciousness, marked autonomic instability, electrolyte imbalances, hallucinations, and death

Source: Federal BOP (2018).

Table 8. *Detoxification overview*

Substance	Monitoring	Primary Treatment	Severity of Withdrawal	Hospitalization
Alcohol	CIWA-Ar Score: As frequently as every hour	• Lorazepam • Thiamine	Low to high; can be fatal	As needed for moderate to severe withdrawal
Benzodiazepines	Vital Signs: Three times a day for 3 days	• Clonazepam	Low to high; can be fatal	As needed for late withdrawal
Barbiturates	Vital Signs: Three times a day for 3 days	• Phenobarbital	Low to high; can be fatal	As needed for late withdrawal
Opiates	Vital Signs: Daily; more often if clonidine used	• Methadone • Clonidine • Symptomatic	Low to high	Usually not necessary
Cocaine	Vital Signs: As needed	• Symptomatic	Low to high	Usually not necessary

Source: Federal BOP (2018).

The American Correctional Association and National Governors Association (2021) created a roadmap for states that highlights existing state efforts and also serves as a policy development tool for government and state officials looking to improve their OUD treatments for people involved in the justice system. The four key building blocks they lay out are as follows:

1. Gather the key players—strategic partnerships can help lay the groundwork for completing needs assessments and supporting program implementation and evaluation;
2. Develop an action plan for integrating medication for OUD (MOUD) into correctional policies and procedures;
3. Build capacity; and
4. Implement and evaluate.

Naloxone, an opioid antagonist, can quickly reverse an opioid overdose if administered in a timely manner (Davis et al., 2014). Overdose education and naloxone distribution programs have been implemented in jail and prison settings in response to the opioid crisis.

Several studies have found that receiving opioid pharmacotherapies while incarcerated significantly reduces mortality (Degenhardt et al., 2014; Larney et al., 2014). Methadone has also been shown to reduce drug use during incarceration (Dolan et al., 2003).

Steps for jails to provide a comprehensive response to substance withdrawal

1. Establish a withdrawal management policy to comport with legal, regulatory, and clinical standards.
2. Create withdrawal management protocols and maintain fidelity in implementing them.
3. Ensure proper staffing and resources are in place to implement the policies and protocols.
4. Train staff to ensure their understanding of and readiness to implement policy and protocol.
5. Engage in continuous quality improvement and implement corrective action in a timely manner.

Source: BJA (2022b).

The ASAM recommends using benzodiazepines to help individuals going through alcohol withdrawals (Mayo-Smith, 1997). The NCDP recommends that anyone dependent on opiates should have access to methadone hydrochloride maintenance therapy, a form of MAT. This is backed by research that has found this kind of therapy can reduce risk behavior while incarcerated and reduce ongoing opioid use, overdose, and death (Brinkley-Rubinstein et al., 2019; Hedrich et al., 2012; Sharma et al., 2016; Wakeman, 2017). MAT is most effective when paired with counseling and behavior therapies (National Sheriff's Association & National Commission on Correctional Health Care, 2018). Macmadu et al. (2020) estimated that 1,840 lives would have been saved in 2016 in the United States if all incarcerated individuals who met the criteria of OUD had received MOUD.

Many jails and prisons do not or previously did not allow MAT programs, however. This means that individuals who were on a MAT program before incarceration will be forced to stop their treatment. There have been recent legal cases that weighed in favor of incarcerated individuals requesting to continue their treatment upon incarceration, reflecting evolving legal standards for what is considered appropriate medical care for OUD (Toyoshima et al., 2021). Massachusetts was the first state to pass a mandate that MOUD treatment be maintained in jails for individuals who were receiving it prior to incarceration and that it must be initiated for individuals already incarcerated when appropriate (Massachusetts Department of Mental Health, 2017; Massachusetts General Laws, 2018). In a qualitative study of Massachusetts county jail staff and contractors, researchers found the legislative mandate and funding for the program increased program acceptance. The staff acknowledged the importance of MOUD training and suggested that it become part of onboarding. These findings suggest that state mandates for MOUD programs could be beneficial and encourage jail administrators and correctional staff to accept this form of treatment (Pivovarova et al., 2022).

There was a 471% increase in the availability of MOUD in jails and prisons between January 2018 and October 2020—a large increase not found in any other facilities such as hospitals, clinics, or long-term care facilities (Dadiomov et al., 2022). This suggests that there is an increased availability of buprenorphine or naloxone, which was previously a barrier for MOUD in jails and prisons. In the 2020–2021 legislative sessions, nine bills were introduced that addressed MOUD access in correctional facilities (Lutgen-Nieves, 2021).

Sufrin et al. (2022) examined the use of MOUD for incarcerated pregnant people in jail settings. The study found that 60% of jails allow the continuation of MOUD during pregnancy. However, a significant proportion of jails (40%) did not allow continuation of MOUD during pregnancy.

Additionally, 32% permitted initiation of MOUD during pregnancy, with many discontinuing postpartum. This suggests many incarcerated individuals entering jails are not receiving the standard of care, putting them at risk.

The increase in new, synthetic drugs has fueled the rise of such drugs being smuggled into correctional facilities (Shafi et al., 2020). Drugs are making their way into jails through mail, visitors, and corrupt correctional staff (Federal BOP, 2003; Russo et al., 2021). Mail is one of the largest entry points for drugs because synthetic drugs can be disguised as ink and written on letters, hidden in books, and diluted in liquids used to soak pages (Russo et al., 2021). Facilities may mitigate drugs coming in by digitizing mail, conducting virtual (video) visits, requiring visitors to pass through full-body scanners, conducting regular searches of incarcerated individuals and staff, drug testing incarcerated individuals, employing K-9 teams trained to detect contraband, and other methods (Russo et al., 2021; Stewart, n.d.).

Illness and Natural Deaths in Jails

Collectively, illnesses are the leading cause of deaths in jails, accounting for approximately half of all deaths since BJS data collection began in 2000. Illnesses, also classified as "natural deaths," include deaths caused by chronic conditions, including heart disease, cancer, and AIDS-related illnesses as well as shorter-term conditions such as influenza or COVID-19. During the study period, the largest proportion of natural deaths that occur in jails was caused by heart conditions (24.5% in 2019; Carson, 2021a), followed by "all other illnesses" (12.9%). The proportion of natural jail deaths gradually decreased over time, accounting for 57% of all jail deaths in 2000 and 46% of jail deaths in 2019.

Individuals in jails are less likely to die because of illness than the general U.S. population, which experiences a mortality rate 3.5 times greater than that in jails (262 deaths per 100,000 U.S. resident population compared with 75 deaths per 100,000 jail population; Carson 2021b). However, individual stays in jail are relatively short (averaging less than a month), and chronic conditions that may lead to natural deaths are over-represented among the jail population (Maruschak et al., 2016; Table 9). For example, in 2011-2012, 61.6% of individuals in jails were overweight (39.3%), obese (20%), or morbidly obese (2.3%), which can be a contributing factor to heart disease (Maruschak et al., 2016).

Table 9. *Prevalence of ever having a chronic condition or infectious disease among individuals in jails and the general population, 2011–2012*

Condition	Incarcerated Individuals	General Population
Ever had a chronic condition	44.7%	26.9%
Cancer	3.6%	n/a
High blood pressure/hypertension	26.3%	13.9%
Stroke-related problem	2.3%	0.5%
Diabetes/high blood sugar	7.2%	4.5%

Heart-related problems	10.4%	1.9%
Kidney-related problems	6.7%	n/a
Arthritis/rheumatism	12.9%	n/a
Asthma	20.1%	11.4%
Cirrhosis of the liver	1.7%	0.1%
Ever had an infectious disease	14.3%	4.6%
Tuberculosis	2.5%	0.4%
Hepatitis	6.5%	0.9%
Sexually transmitted diseases	6.1%	3.5%
HIV/AIDS	1.3%	0.3%

Source: Maruschak & Berzofsky (2016).

Many infectious diseases are found at higher rates in jail populations than the general public. Sexually transmitted infections such as syphilis, trichomonas, herpes simplex virus (HSV), and human papilloma virus (HPV) are more prevalent among individuals in prison and jail (Nijhawan, 2016). Hepatitis C (HVC) is roughly 10–20 times higher for those incarcerated than for the general population (Varan et al., 2014). Although HVC will rarely kill an individual directly, it is the leading cause of liver failure, hepatocellular carcinoma, and cirrhosis in the United States, which can be deadly (Davis et al., 2010; Ly et al., 2016).

The recent COVID-19 pandemic presented significant challenges to jails because of its high transmission rate. Recent estimates indicate that between 2,500 and 3,000 incarcerated individuals (including those incarcerated in jails and prisons) died from COVID-19 (The Third City Project, n.d.; Turcotte et al., 2021) between the start of the pandemic and mid-2023.

Policies and Practices to Mitigate Natural Deaths in Jails

Correctional facilities, including jails, are required to address the medical needs of incarcerated individuals, as specified by the Supreme Court's decision in *Estelle v. Gamble*, holding that failing to do so violates the Eighth Amendment prevention of cruel and unusual punishment (Wright, 2008). Most jail stays are relatively short and therefore may not provide sufficient time to identify or address chronic medical conditions adequately. Furthermore, many jails charge inmates a co-pay for medical services, which can be a disincentive to seeking care. However, with approximately 10 million individuals admitted to jail facilities in the United States each year, jails have the opportunity and responsibility to diagnose, identify, and provide care in response to medical conditions, many of which may lead to death.

Although it is understood that cardiovascular disease (CVD) is one of the leading causes of death among incarcerated individuals (Noonan et al., 2015), there are three potential explanations for this association: (1) the groups of incarcerated individuals are the same groups of individuals who are already at higher risk for CVD, such as those with lower socioeconomic (SES) or racial minorities; (2) the experience of incarceration may be a stressor, which may increase coping mechanisms such as smoking that put the individual at higher risk for CVD; and

(3) diet and physical activity behaviors of individuals may be disrupted by incarceration (Wang et al., 2017). A meta-analysis focused on the evaluation of health among incarcerated individuals suggested that supervised exercise and sports programs could reduce physical CVD risk factors (e.g., reduce weight, improve blood pressure) and improve overall mental health (Papa et al., 2021). However, jails, as opposed to prisons, typically have limited area for exercise. Further research is needed to implement strategies that have been shown to mediate CVD or improve access to CVD health care to reduce deaths in jails (Wang et al., 2017).

Regarding infectious diseases, universal screening upon entrance to jail would help treat patients earlier and provide an opportunity to educate patients about risk management, including behavioral, vaccination and other approaches to reduce the risk of transmission. Lessons from the recent COVID-19 pandemic include strategies such as offering incentives for incarcerated individuals to get vaccinated and decarceration policies to accelerate the release of individuals who do not pose a risk to society, and ending pre-trial detention for those who cannot afford bail (Barsky et al., 2021). Partially in response to such policies, the number of incarcerated people in prisons and jails dropped by 14% between 2019 and mid-2020. Malloy and colleagues (2021) found that decarceration of 9% of the incarcerated population in a large urban jail led to a 56% decrease in COVID-19 transmission. The D.C. DOC worked to decarcerate individuals in jails during the early months of 2020 and followed the U.S. Centers for Disease Control and Prevention's guidelines and was able to lower its COVID-19 in-jail transmission rate to zero during the last 5 months of 2020 (Epting et al., 2021).

Selected policies and practices designed to reduce jail deaths because of *natural causes*:

- Increase clinical staff to conduct screening for medical and mental health needs at intake.
- Require correctional officer training around basic health response protocols.
- Acquire National Commission on Correctional Health Care (NCCHC) facility health service accreditation.
- Focus on decarceration policies to reduce the number of inmates during high disease transmission circumstances (e.g., COVID-19 pandemic).

Telehealth services are another new and innovative way to help meet health needs while reducing reliance on other resource-intensive options, such as transferring incarcerated individuals to care facilities. Telehealth can offer individuals OUD treatment services, connect individuals via live video to physicians or other health care providers, and provide remote monitoring of individuals' health conditions (BJA, 2020). Telehealth services offer another avenue for care with a smaller burden on a jail facility. However technological integration should also begin at intake. In a case study that looked at five different counties and their approach to improving information technology in relation to their jail's health care services, researchers found that creating this flow of information between the jail health systems and jail management systems improved communication, security, and health care services for detainees (Butler, 2013). Using electronic records widely can provide staff with up-to-date and historical information regarding the health of incarcerated individuals and potential warning signs related to their health. Ultimately, integrating technology into jail processes, when possible, may create efficiencies in identifying and intervening for individuals with health-related risks while easing the burden on jail staff.

Homicides in Jails

Homicides account for approximately 2% of deaths in jails, a proportion that has held steady since BJS Mortality in Corrections data collection began in 2000. Homicides include those committed by other incarcerated individuals, those resulting from the use of force by staff, and those resulting from assaults sustained prior to incarceration (Carson, 2021a, p. 3). Males were by far more likely to be the victim of homicide, accounting for more than 98% of homicide deaths from 2000–2019. Black and White individuals died by homicide at the same rate (4 deaths per 100,000 incarcerated individuals), and older individuals—those 55 or older—died at a rate nearly triple any other age group (a rate of 14 per 100,000; Carson 2021a). Individuals incarcerated for violent offenses were also twice as likely to be the victim of homicides while incarcerated.

Policies and Practices to Mitigate Homicides in Jails

Assessing specific policies and practices to mitigate homicides in jails requires a consideration of the type of homicide. For example, homicides that result from correctional officer use of force can be better mediated by training for correctional officers around de-escalation techniques, restraint tactics, and any health risks that may predispose an individual to an adverse reaction to such tactics. Homicides that result from injuries sustained prior to incarceration, like most deaths of jailed individuals, may best be prevented with risk identification and access to medical care. Understanding more about the correlates and prevalence of all types of homicides in jails can inform such policies, yet the number of homicides that occur in jail settings is relatively low compared with other manners of death, making such examination challenging.

Homicides committed by other incarcerated individuals can best be addressed through policies designed to prevent assaults. Policies and practices include proper classification to ensure incarcerated individuals are housed properly, gang management, appropriate use of segregation units, and maximizing visibility of correctional officers to all locations where individuals can interact with one another. Because of the limited means available to confined individuals, contraband poses an obvious safety concern (Koslover et al., 2017). Contraband can include homemade weapons created from common items and knives or other dangerous weapons. Recognizing and mitigating the flow of contraband into a facility may assist in lowering the rate of homicides in jails.

There are three main categories of contraband detection technology, as outlined by Koslover et al. (2017). Person-borne detection is capable of detecting contraband concealed on a person and can include handheld scanners and x-ray machines. Vehicle-borne detection aims to find contraband hidden within vehicles and can include handheld or drive-through technologies. The last category is environmental detection, which seeks to detect contraband hidden within an environment like an individual's cell.

Dix et al. (2021) outlined key considerations for the successful use of contraband detection solutions, including looking at operational achievability, restrictive policies and legislative constraints, and health and safety protections. In discussing the management of weapons

contraband, the authors point out that although there are numerous forms of technology to assist with the detection of contraband, such as handheld x-rays or intelligent software, such technology will never replace the need for rigorous and random searches of individuals' living, working, and recreational areas.

Accidents in Jails

Accidents account for about 2% of deaths in jails, a proportion that has held relatively steady since data collection began in 2000 (ranging from a low of 1.6% to a high of 3.5%). Accidental deaths affected jail populations at roughly similar rates, except for older individuals—those 55 or older—who experienced accidental deaths at a rate of 17 deaths per 100,000 incarcerated individuals (Carson 2021a).

Policies and Practices to Mitigate Accidental Deaths in Jails

Features designed to make jails safe for incarcerated individuals may also prevent accidental deaths. Policies and programs may also identify individuals at greater risk for accidents, such as older individuals or those with a disability, and prevent accidents through specific housing (e.g., lower bunk assignment), work, or other assignments.

Policies and Practices Designed to Mitigate all Jail Deaths

Several policies and practices may prevent multiple types of deaths of incarcerated individuals. For example, the NCCHC recommends that all incarcerated individuals be screened immediately upon intake and no more than 2 to 4 hours following intake. However, many jails do not have medical or nursing staff on site to screen incoming individuals for medical or mental health needs immediately at intake, and smaller jails (those with an average daily population of 500 or fewer incarcerated individuals) are less likely than larger jails to have round the clock clinical services. Smaller jails may also be more rural and not close to emergency services. Lack of access to clinical staff could mean missing the identification of potentially life-threatening health problems (Huh et al., 2018).

NCCHC Care and Treatment Standards:

- Information on Health Services
- Receiving Screening
- Transfer Screening
- Initial Health Assessment
- Mental Health Screening and Evaluation
- Oral Care
- Nonemergency Health Care Requests and Services
- Emergency Services
- Segregated Incarcerated individuals
- Patient Escort
- Nursing Assessment Protocols
- Continuity and Coordination of Care During Incarceration
- Discharge Planning

The NCCHC was originally an American Medical Association (AMA) jail project that became an independent nonprofit in 1983 (Penn, 2015). Its mission is "to improve the quality of health care in jails, prisons, and juvenile confinement facilities." Correctional facilities are able to obtain accreditation from NCCHC by requesting an assessment. Three types of accreditations are offered: facility health services, mental health services, and opioid treatment programs. The

accreditation process uses external peer reviewers to determine if a facility has met NCCHC standards. The external team will review medical records, interview staff, and examine the facilities and equipment (Gibson & Phillips, 2016). Fiscella et al. (2004) noted that as of 2014, only 8% of jails had obtained NCCHC accreditation.

In one of the first studies to examine correctional health care accreditation data, Gibson & Phillips (2016) analyzed all NCCHC compliance reports for jails and prisons from 2008 through 2014 to identify trends in compliance or noncompliance and facility characteristics. They found that larger facilities and those with larger populations were more likely to have difficulty complying with NCCHC's care and treatment standards.

Recommendations

Recommendations for promising practices to reduce deaths in jail custody are limited by the lack of research available and largely incomplete information on the scope and characteristics of deaths that occur in jail custody. However, the recommendations found in the literature suggest prioritizing early identification for those at risk of death (of any kind), implementing a plan to help in prevention, and providing training to staff on how to appropriately identify risks and how to manage the ongoing care of incarcerated individuals. Although it is important to identify those at risk, use of segregation or isolation practices should also be used sparingly to avoid psychological stress. Steps to mitigate contraband should also be increased wherever possible to reduce the entry of illicit substances or weapons into jails. Furthermore, changes to facility design to prevent suicide should also be undertaken when possible.

Recommendation 1. Identify and assess facility-based and individual risks for death for incarcerated individuals and implement plans to mitigate these risks.

An effective facility risk management plan can identify and mitigate risks for jail deaths. For example, White individuals had the highest mortality rates for illness, suicide, and deaths due to intoxication. Males have a greater suicide mortality rate than females, while females are more at risk for deaths due to intoxication. Similarly, individuals ages 55 or older had the highest mortality rate for illness. Proper screening of individuals most at risk is key to an effective risk management plan. According to Martin & Reiss (2008), the four main tasks of an effective risk management plan are as follows:

1. Continuously assessing risks associated with jail operations.
2. Determining which risks are most important to manage.
3. Implementing strategies to control those risks.
4. Evaluating the effect of their efforts and adjusting as needed.

On top of a risk management plan, a behavior management plan supports a safe and well-maintained facility. Early identification of at-risk individuals (those with mental health issues, previous suicide/self-harm behaviors, substance use disorders, high-risk medical diagnoses) is key to effectively developing a behavior management plan for those who are incarcerated in jails. An effective management plan is essential for mitigating risks and negative behaviors among the incarcerated population, particularly in older jails that are not as well-suited for

direct supervision as more modern jails that are specifically designed for this purpose (Hoke, 2013). The six key elements of an effective behavior management plan, as outlined by Hutchinson et al. (2009) were found to have led to positive staff and incarcerated individual outcomes in the Brazos County (TX) Jail (Hoke, 2013).[14] These elements include the following:

1. Assessing risks and needs of each incarcerated individual at various points during their detention.
2. Assigning incarcerated individuals to housing.
3. Meeting individuals' basic needs.
4. Defining and conveying expectations for incarcerated individual behavior.
5. Supervising incarcerated individuals.
6. Keeping incarcerated individuals occupied with productive activities.

In addition to risk management and behavior management plans, facilities should also have an emergency response plan. The plan should be written down and staff should perform practice drills. These drills should be documented so that the response can be critiqued, and improvements made, where needed (National Commission on Correctional Health Care, n.d.-a).

Recommendation 2. Provide adequate staffing and regular health and emergency response training to all relevant jail staff or personnel.

NCCHC recommends that correctional officers receive health training as they are part of the process for delivering health care to incarcerated individuals. Beyond receiving CPR training, correctional officers should be able to recognize acute manifestations of chronic illnesses and signs of intoxication and withdrawal, be trained on how to prevent the spread of communicable diseases, and be able to recognize symptoms of mental illness and engage in suicide prevention (National Commission on Correctional Health Care, n.d.-b). In addition to staff training, other forms of education and outreach, such as information sessions or posted signage that can aid jail staff and incarcerated individuals in recognizing signs of illness and measures to prevent illness can also be implemented (Berg, 2019).

Indeed, training should not be limited to emergency response but should also include policies related to routine interactions between incarcerated individuals and corrections officers. This could include increasing awareness around the warning signs for at-risk individuals, changes in protocol on how to interact with at risk or in danger individuals, how to document an incident, and steps to take to escalate an incident to management if it demonstrates further mortality risk.

Training should be required for all new staff and should be refreshed at least annually (Hayes, 2012). Jail leadership should not be exempt from the trainings and should also be involved in

[14] The Brazos County Jail implemented the National Institute of Corrections' (NIC)'s Inmate Behavioral Management (IBM) initiative. The Brazos County Jail was not designed to facilitate direct supervision, which presented difficulties in managing incarcerated individuals' behavior. One critical component of the IBM initiative was on staff training that increased the frequency and quality of interactions between jail staff and incarcerated individuals, in spite of the jail design. An outcome evaluation of the IBM program suggested there was a general decrease in the pattern of misconduct reports among the jail's incarcerated population over a 1-year period after implementing the program.

facilitating trainings that address the current needs of a facility (Stinchcomb et al., 2011). The National Sheriff's Association and National Commission on Correctional Health Care (2018) recommend funding enhanced training for correctional staff to build leadership capacity and skills to effectively assist individuals who have mental health and substance use disorders.

Recommendation 3. Deliver immediate, consistent, and varied mental health care for individuals incarcerated in jails.

Although the research suggests that there is not a single approach that will effectively reduce mortality among incarcerated individuals, a combined and evolving approach may help balance the barriers or variances in treatment. Screening individuals at intake and throughout their period of confinement can help identify individuals who may require mental health treatment or be at risk of suicide (Hayes, 2012). For individuals with mental illness, jail incarceration can be a major stressor linked with heightened risk for suicide, not only in jail but after an individual returns to the community. Some programs, like the Safety Planning Intervention implemented in the Suicide Prevention Intervention for at-Risk Individuals in Transition (SPIRIT) study, attempt to reduce this risk among individuals being held in jail pre-trial by bringing community mental health counselors into jails to conduct a suicide risk reduction plan. Although the program is specifically geared at reducing risk of suicide within the year after individuals leave jail, aspects of the program may also serve to reduce suicide risk while incarcerated.

Beyond screening for suicide risk and implementing programs designed to reduce this risk, some research suggests that altering the physical environment in which individuals are held may be beneficial to mental health-related outcomes as well. Larger, open spaces have been linked to greater adherence to psychiatric medication and lower rates of self-injury among individuals assigned to these units (Ford et al., 2020). Suicide-resistant housing units may also be implemented when possible to mitigate these risks (Hayes, 2012). Housing individuals deemed suicidal in more open areas where they are easier to monitor may also prevent suicide completion.

Minimizing and consistently assessing segregation or isolation measures may also reduce risk. For example, reducing the maximum number of days allowed in segregation and, for those who do get sent to segregation, creating a treatment plan to help reduce the likelihood of psychological stress could be effective tactics to mitigate suicide risk.

In general, feasible and actionable guidelines for care should be developed. The National Sheriff's Association and National Commission on Correctional Healthcare (2018) recommended that facilities enhance jail-based mental health services to better serve and respond to individuals with mental health and substance use disorders by developing national jail guidelines for care. These guidelines would specifically cover the provision of mental health care services; development and dissemination of model contract language for jail-based health care service delivery; and provision of resources and technical assistance to support the sharing of information across systems to better understand the problem and prioritize those who need services while securing privacy. Privacy and confidentiality should be preserved wherever possible for individuals who are being assessed for medical or mental health issues.

Recommendation 4. Leverage and integrate technology in jail operations to reduce mortality risk.

Technological integration in jail functions and processes may help reduce mortality risk in jails. Emerging technologies that have been implemented in some jails have implications for suicide-related risks in particular. For example, one California jail has implemented software that identifies when individuals use certain language in their recorded phone calls that are indicative of suicide risk. Jail staff are able to follow up and bring in a mental health professional for further evaluation if necessary. Another strategy is to provide vital sign monitoring bracelets to individuals deemed at high risk of suicide with the goal of staff being able to intervene during critical moments (Associated Press, 2022). When coupled with a process to assess and intervene with the individual in crisis, these types of technologies could serve as valuable early warning systems and safeguards that may reduce deaths by suicide in jails.

Beyond suicide prevention technologies specifically, telehealth services are another new and innovative way to help meet health needs while reducing reliance on other resource-intensive options, such as transferring incarcerated individuals to care facilities. Telehealth can offer individuals treatments, connect individuals via live video to physicians or other health care providers, and provide remote monitoring of individual's health conditions (BJA, 2020). Telehealth services offer another avenue for care with a smaller burden on a jail facility. Using electronic records widely can provide staff with up-to-date and historical information regarding the health of incarcerated individuals and potential warning signs related to their health. Ultimately, integrating technology into jail processes, when possible, may create efficiencies in identifying and intervening with individuals with mental health- or health-related risks, while easing the burden on jail staff.

Recommendation 5. Conduct continual reviews and investigations of jail deaths to identify issues and make improvements.

As of 2006, more than 60% of jails did not have a formal mortality review process after a jail suicide (Hayes, 2010). If an incarcerated individual dies while in the custody of a correctional facility, the death should be thoroughly reviewed to ascertain whether changes in policies, practices, or procedures are warranted, and to identify any issues that may need to be further investigated. These mortality reviews should be separate from other formal death investigations, such as autopsies conducted by a medical examiner (Hayes, 2007). NCCHC recommends taking a three-pronged approach to death reviews. The first approach is an administrative review, where correctional and emergency responses surrounding the death are reviewed. The second is a clinical mortality review of the clinical care provided and circumstances leading up to the death. Finally, the third is a psychological autopsy for suicides, usually performed by a psychologist to reconstruct the decedent's life through staff and incarcerated individual interviews and review factors that may have led them to take their life (National Commission on Correctional Health Care, n.d.-c). The Federal BOP incorporates suicide death investigations into its suicide prevention program policy (Federal BOP, 2007). Furthermore, some researchers have examined the feasibility of implementing sentinel-event reviews of jail suicides that entails a "move away from a view of error as solely the product of individual negligence and instead encourage an institutionalized approach that identifies root

causes and underlying systems failures" (Pope & Tan de Bibiana, 2019). Incorporating death reviews into jails' standard operating procedures may increase the opportunity for identifying areas of improvement with the goal of reducing the likelihood of similar deaths in the future.

Recommendation 6. Conduct more research on the individual, agency-level, and situational factors that are most associated with jail deaths.

Existing research has identified certain demographic groups as more at risk than others of dying while in jail. This research, and the results of our secondary analyses, suggests that White individuals are at an elevated risk of dying by illness, suicide, and death by intoxication. Additionally, males have higher suicide rates than females, but females have higher intoxication mortality rates. Furthermore, individuals ages 55 or older are most at risk for illness-related deaths. More research should be conducted on individual-level factors, including mental illness and drug use, that may predict the likelihood of an individual dying while in jail and why. This understanding can lead to the development of ways to properly screen and identify those most at risk.

Agency-level factors, including jail size, jail capacity, program availability and use, and the policies and practices implemented by agencies should also be examined further. As noted in the secondary analyses, most jails did not experience any deaths during the period examined, and this was particularly true for suicide, homicide, accidental deaths, and deaths due to intoxication. Because deaths in jails are rare, it can be difficult to identify agency characteristics, policies, and programs that are significantly related to these deaths. Qualitative case studies or other innovative research methods may provide additional insight into agency-level features that are more or less associated with jails deaths, including by different manners of death.

Conclusion

Findings from the environmental scan and secondary analysis of existing data sets provide a relatively comprehensive overview of what is known about persons who die while in custody of jails. Assessing the evidence to determine to which policies and practices are associated with these deaths is complicated by the general lack of research and data available. Many promising practices or critical factors related to the various manners of death have not been rigorously investigated or, as in the case of homicide and accidental deaths, at all. This is further complicated by the relatively rare nature of deaths in jails. Most jails do not report a death each year. In 2019, 90% of jails reported zero suicides, 95% reported zero intoxication deaths, and 99% reported having zero homicides or accidents. Even when a facility reports a death in one year, it is not likely to have another in a subsequent year.

Another complication is that although a jail might have a relatively high suicide rate, it does not necessarily have a high intoxication or homicide rate. Each manner of death is likely to require a different approach or set of solutions. Illness-related deaths are driven by access to medical care whereas suicide deaths are likely linked to proper screening, supervision, and treatment. Within each jail, certain populations are more at risk for certain types of death. For example,

men are more at risk for suicide than women, but women are more at risk for intoxication. Therefore, the risk profile for any facility will be determined in part by the population that is being housed.

A few facility-level factors examined here are shown to be critical. Although large jails are more likely than smaller jails to report a death, the mortality rate is much greater for smaller jails. Other factors such as a low staff-to-incarcerated individual ratio and jails operating over capacity are associated with higher death rates, but these differences become less pronounced or significant when accounting for other factors.

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Understanding and Reducing Deaths in Custody: State Prisons

Interim Report

Prepared for

Benjamin Adams, Program Manager
National Institute of Justice
Office of Justice Programs
U.S. Department of Justice

June 2024

RTI Project Number 0218273.000

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RTI INTERNATIONAL

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Introduction

Prisons are longer-term facilities that typically hold individuals convicted of felony offenses, parole violators, or individuals with sentences of longer than 1 year. Prisons are operated by states, the Federal Bureau of Prisons (BOP), or a contracted private entity. At midyear 2019, there were 1,677 adult correctional facilities; 1,155 of these were operated by state authorities, 411 by private entities, and 111 by the Federal BOP (Maruschak & Buehler, 2021). At the end of 2021, there were approximately 1.2 million individuals confined in U.S. state or federal prisons, down 16% from 1.4 million in 2019 (Carson, 2022).

The Bureau of Justice Statistics (BJS) reported that 4,234 individuals died in state and federal prisons in 2019 (Carson, 2021). This is a 6% decrease from 4,515 individuals in 2018 but a 34% increase from 3,170 individuals in 2001. State prisons or private prisons under state contract accounted for 3,853 deaths in 2019. In 2019, the mortality rate in state prisons was 330 per 100,000 incarcerated individuals, up from 242 in 2001. Deaths[1] due to illness, such as heart disease and cancer, accounted for 79% of all state prison deaths.

Federal BOP

The focus of this report is primarily on deaths attributed to state prisons or privately operated facilities under state contract, which account for 91% of deaths that occurred in 2019. However, it is important to note that Federal BOP facilities account for several deaths each year. In 2019, the BOP reported 381 deaths. Illness accounted for 81% of these deaths, followed by suicide (3%). These statistics and more information on federal BOP deaths can be found in Carson, A. (2021). *Mortality in state and federal prisons, 2001-2019 – Statistical tables, December 2021* (NCJ 300953). Bureau of Justice Statistics. https://bjs.ojp.gov/content/pub/pdf/msfp0119st.pdf

State correctional agencies, the focus of this report, are responsible for the custody of incarcerated individuals. Prison administrators are responsible not only for developing and implementing strategies to prevent violence and self-harm among the incarcerated population but also for providing an overall environment and health care that address the physical and mental health concerns of this population.

Individuals may enter prison with pre-existing mental or physical health conditions, and these may be compounded by lack of access to or continuity in care. About 43% of individuals incarcerated in state prisons had a history of a mental health problem (Maruschak et al., 2021). The use of restrictive housing, also known as solitary confinement, has been shown to increase physical and mental health problems. Prison conditions of overcrowding, structural or physical deficiencies in the buildings themselves, and insufficient officer-to-confined-individual ratios can further lead to situations that increase the risk for physical injury,

[1] Deaths are classified by both manner and cause, with the cause being the underlying illness or injury that led to the death and the manner being the determination of how that illness or injury led to the death. Manner of death is classified as occurring naturally, by accident, by suicide, by homicide, or in an undetermined manner.

illness, and mortality. The quadrupling of the prison population over the past 3 decades, along with individuals serving longer sentences and an increase in older individuals sentenced to prison, has led to an aging population with specific health care needs that may not be easily treated or prioritized in a prison facility setting (Carson & Sabol, 2016).

This study is part of the National Institute of Justice (NIJ) Death in Custody Reporting Act (DCRA) Study, which is designed to generate significant advances in the knowledge and understanding of deaths in custody and to result in recommendations that support efforts to prevent, or at least reduce, such deaths. The DCRA Study is conducted pursuant to the requirements set forth in the 2014 reauthorization of the Death in Custody Reporting Act (DCRA 2013),[2] which requires the Attorney General to conduct a study and submit a report to Congress to "(A) determine means by which such information can be used to reduce the number of such deaths, and (B) examine the relationship, if any, between the number of such deaths and the actions of management of such jails, prisons, and other specified facilities relating to such deaths" (see 34 U.S.C. § 60105 (f)(1)(A) & (B)).

DCRA 2013 further requires states to document and report the death of any person being held in custody by law enforcement, jails, or prisons. DCRA defines "in custody" as any person who is detained; under arrest; in the process of being arrested; en route to being incarcerated; or incarcerated at a municipal or county jail, state prison, state-run boot camp prison, boot camp prison that is contracted out by the state, any state or local contract facility, or other local or state correction facility[3] (Bureau of Justice Assistance, 2022).

All DCRA Study activities are organized by the three main contexts in which deaths in custody occur: law enforcement custody, jails, and prisons. Each of these contexts presents distinct prevalence rates, common causes and manners of death, and situational factors. For example, law enforcement officers engage community residents primarily in an open environment, whereas jail and prison confinement facilities are highly regulated, closed environments. However, jail populations are more fluid, with individuals incarcerated an average of 33 days, whereas prisons generally incarcerate individuals who are sentenced to more than 1 year in state or federal jurisdiction. These different contexts demand different practices, policies, and solutions to reduce deaths.

This report describes the prevalence and characteristics of deaths that occur in state prisons and presents an overview of the policies and practices designed to reduce such deaths. The prevalence of deaths occurring during interactions with law enforcement outside of confinement and in jail settings and the policies and practices associated with reducing deaths occurring in these settings are explored in more detail in separate reports. To gain a better

[2] The Death in Custody Reporting Act, first passed in 2000 (P.L. 106-297), required the collection of individual data on deaths in the process of arrest, local jails, and state prisons. DCRA 2013 was reauthorized in December 2014.
[3] DCRA also requires the head of each federal law enforcement agency to submit information regarding the death of any person who is in custody. See Brooks & Goodison (2022) for reports of deaths associated with federal agencies.

picture of the context and policies related to deaths in state prisons, RTI International conducted a two-phase analysis and review of the existing data and literature. Using data from the BJS Mortality in Corrections series extending from 2001 through 2019, the most recent year available, RTI analyzed the prevalence, individual and facility characteristics, and circumstances associated with mortality in prisons. Concurrently, RTI conducted an environmental scan of the literature and current policies in place regarding deaths in prison.

Methodology

This report explores the prevalence and correlates of mortality in prisons and describes selected management practices and policies that may be associated with or that are designed to reduce these deaths. RTI conducted a secondary analysis of existing mortality data and an environmental scan of the literature.

Using data from the BJS Mortality in State and Federal Prisons series, extending from 2001 through 2019 (Carson, 2021), RTI analyzed the prevalence, individual and facility characteristics, and circumstances associated with prison deaths in custody. Then, using the three waves of the Census of State and Federal Adult Correctional Facilities (2005, 2012, 2019),[4] RTI linked deaths that occurred in each year were linked to the associated prison facilities. The primary research questions are as follows:

1. How many people die each year in U.S. prisons?
2. Who dies in prison?
3. What are the manners and causes of these deaths?
4. What prison facility characteristics and programs are associated with these deaths?

To address these questions, RTI performed descriptive, cross-sectional, and longitudinal statistical analyses. First, we show the number, mortality rate (per 100,000 incarcerated individuals), and percent change of deaths by selected characteristics. The number of deaths describes the size of the problem, relative differences between groups, and trends over time. The mortality rate accounts for the size of the population and captures differences between groups and change over time. Next, the report examines the association between prison facility characteristics and programs and the number and rate of in-custody deaths. Finally, the report presents the results of a multivariable analytical model to examine the relationships between the characteristics of confinement prisons and deaths, focusing on potential risk factors and practices. Answers to these questions can point to potential populations, places, and practices most at risk for a death in custody case. Furthermore, examining change over time might reveal changes in risk for certain types of deaths, individuals, or facilities.

[4] The 2019 Census of State and Federal Adult Correctional Facilities, a periodic data collection conducted by the BJS, is an enumeration of state correctional facilities and federal BOP facilities. The collection obtains data related to the operations of correctional facilities and the conditions of confinement. For more information, see Maruschak & Buehler (2021).

It is important to note that the COVID-19 pandemic had a significant impact on prisons and the criminal justice system overall (Jackson et al., 2021). For prisons, the size of the inmate population declined because of early releases and fewer admissions (Carson et al., 2022). For those who remained in prison, COVID-19 placed additional stress on a health care system that already faced many challenges delivering services. The specific impact of COVID-19 on prison deaths is outside of the scope of the data used in this report and is therefore not addressed in the statistical analyses.

Concurrently, RTI conducted an environmental scan of the scientific and gray literature and current policies regarding deaths in prison. The environmental scan findings and recommendations presented below are based on (1) a review of relevant reports and policies from federal, state, and local agencies; professional organizations; and academic journals to identify the prevalence and correlates of prison deaths and strategies designed to reduce such deaths and (2) website scans of selected prisons to identify enduring and emerging policies and practices related to prison deaths.

The literature review focused on several primary sources, including federal agencies responsible for collecting data related to deaths in custody, such as the BJS and the Bureau of Justice Assistance, state and federal corrections websites, professional organizations that represent or interact in the prison sector (e.g., American Correctional Association, National Commission on Correctional Health Care), federal and state legislation pertaining to reporting deaths in custody, and academic and scholarly reports. Relevant materials were identified through two approaches. First, we used keyword searches through electronic library databases to identify a wide array of related articles (e.g., "BJS in-custody deaths") published within the past 10 years (2013–2023); second, organizations' websites were searched directly (e.g., from BJS' website, searching "in-custody deaths").

Overview of Deaths in Prison Custody – State of the Problem

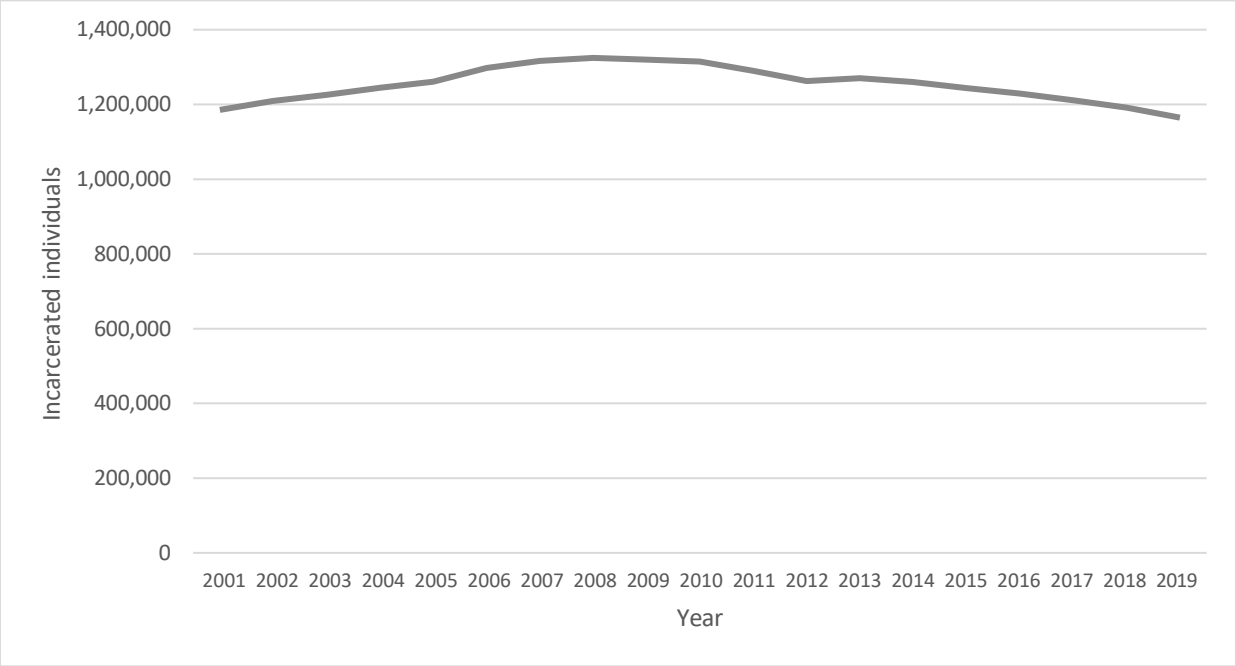
According to BJS, which conducts the annual Census of Adult Correctional Facilities, prisons are longer-term facilities that typically hold individuals convicted of felony offenses, parole violators, or individuals with sentences of longer than 1 year. In 2019, there were 1,155 state-operated prisons and another 411 privately run facilities (Maruschak & Buehler, 2021). Confinement facilities, those facilities where most individuals are not free to leave unaccompanied, made up 69% of all adult facilities and held about 95% of all incarcerated individuals in 2019.[5] Community-based facilities made up the remaining 31%.

The total number of individuals held in state prisons increased from 1.2 million in 2001 to a high of 1.3 million in 2008 before declining back to 1.2 million in 2019 (Carson, 2021; Figure 1).

[5] Community-based facilities are those that either report community corrections as their primary function or permit 50% or more of their prisoners to leave the facility unaccompanied. Confinement facilities are those in which fewer than 50% of prisoners are permitted to leave the facility unaccompanied and do not report community corrections as their primary function.

Additionally, over time, more individuals were serving longer sentences and more individuals 55 years old or older were sentenced to prison. These factors were associated with the aging of the prison population, such that individuals ages 55 or older began accounting for a larger percentage of the total population, posing challenges to identifying and addressing medical health needs.

Figure 1. *Estimated number of individuals incarcerated in state prisons: 2001–2019*

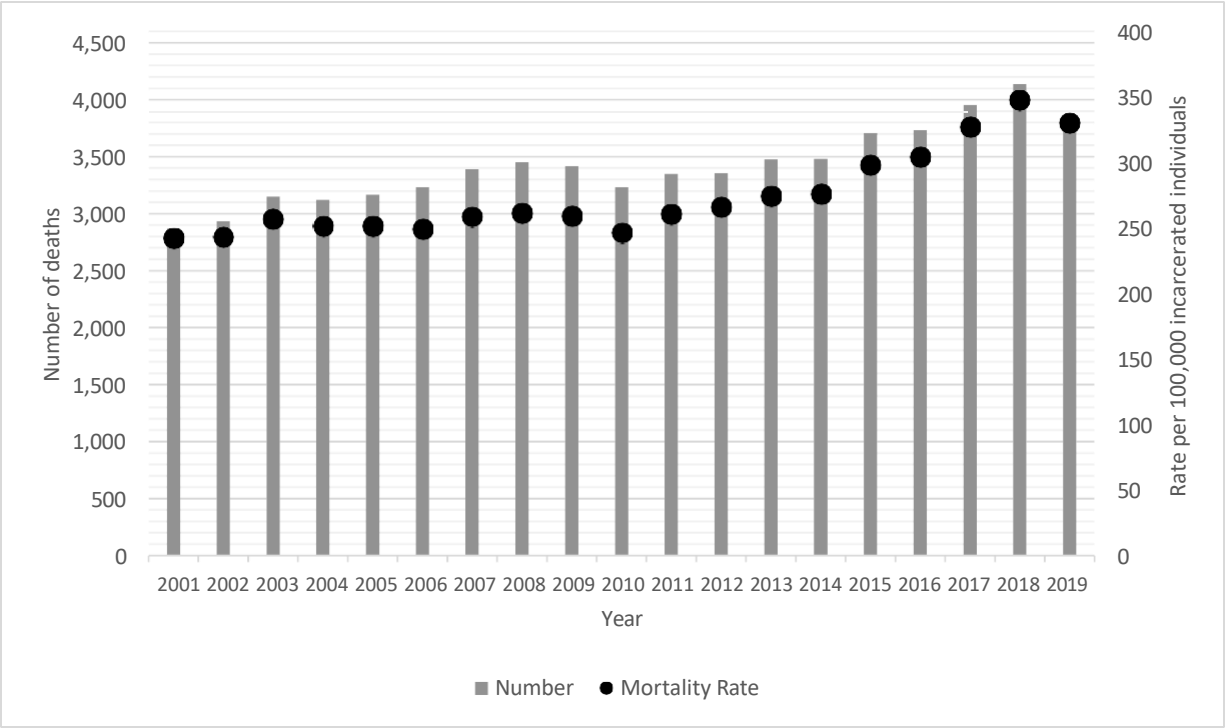


Source: Carson (2021).

The Prevalence of Prison Deaths

In 2019, 3,853 individuals died while in the custody of state prisons—a 7% decline from 2018 (4,137 deaths; Figure 2). Since 2001, the number of deaths increased from 2,869 to 3,452 in 2008, then dropped to 3,233 in 2010. From 2010, the number of deaths increased by 28% to a high of 4,137 in 2018. The change in the number of deaths in state prisons over time can be partially attributed to changes in the size of the prison population and expressed as the mortality rate (i.e., number of deaths per 100,000 confined individuals). Although similar in more recent years, the trends between prevalence death counts and rates did vary. In 2001, 242 individuals died in state prisons for every 100,000 individuals confined, a low across the entire period (2001–2019). This rate remained relatively stable through 2010. Beginning in 2010, the mortality rate increased every year, to a high of 347 per 100,000 in 2018, before declining to 330 in 2019. As noted previously, the impact of COVID-19 on prison deaths is outside the period included in this report and is not addressed.

Figure 2. *Number and mortality rate of state prison deaths: 2001–2019*

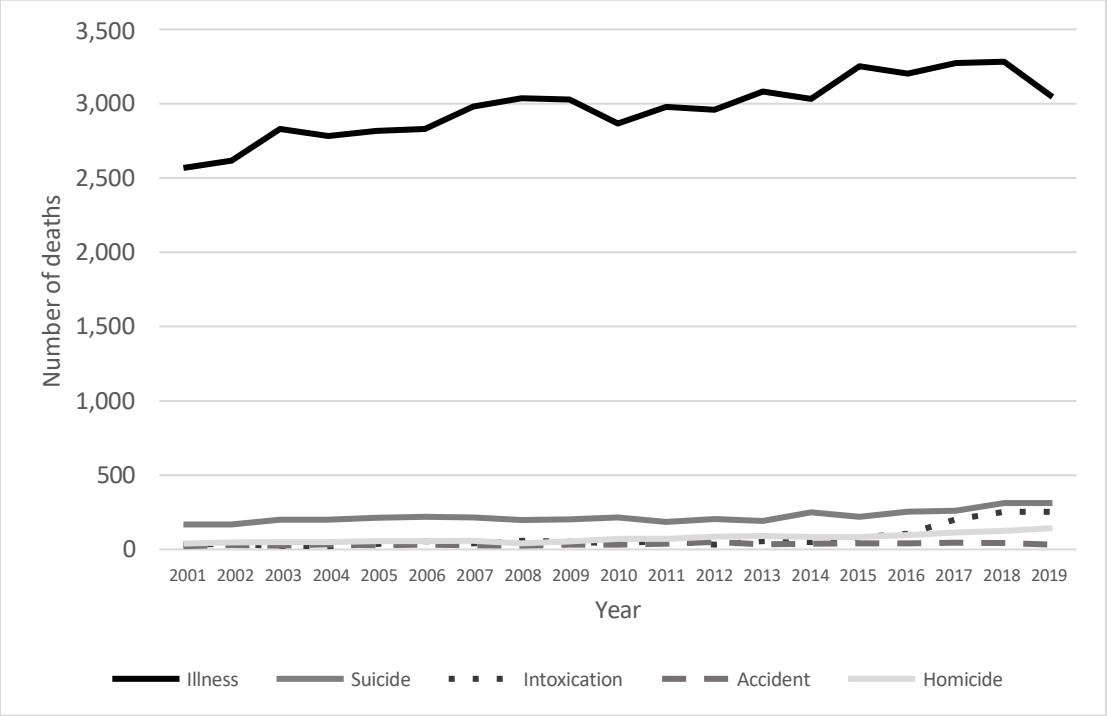


Source: BJS, Mortality in Correctional Institutions, 2001–2019.

BJS' Mortality in Correctional Institutions data classifies deaths by manner (homicide, suicide, natural causes, accident, or undetermined) further classifies natural manners of death by the underlying cause (e.g., heart disease, cancer, liver disease, other illnesses such as diabetes and influenza) and also separately tabulates deaths caused by drug or alcohol intoxication (which may be classified as accidental, because of natural causes or as other manners, depending on the circumstances found by a medical examiner or coroner). The predominant manner of prison deaths is natural deaths caused by illness, followed by suicides.

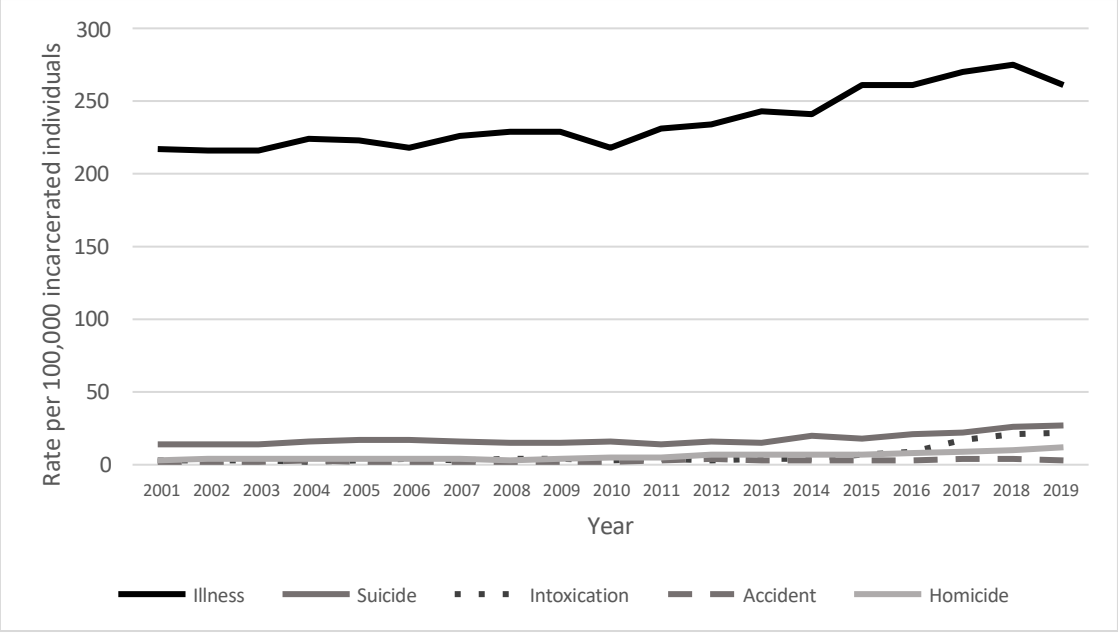
Illness accounted for the deaths of 2,567 individuals incarcerated in state prison in 2001, or about 89% of all deaths (Figure 3). Since then, the number has risen to 3,282 in 2018, accounting for 79% of all prison deaths, and dropped to 3,044 in 2019. The rate of illness deaths has followed a slightly different trajectory since 2001, remaining primarily flat through 2010 and then slowly rising to a high of 275 per 100,000 in 2018 (Figure 4).

Figure 3. *Number of deaths in state prisons, by manner of death: 2001–2019*



Source: BJS, Mortality in Correctional Institutions, 2001–2019.

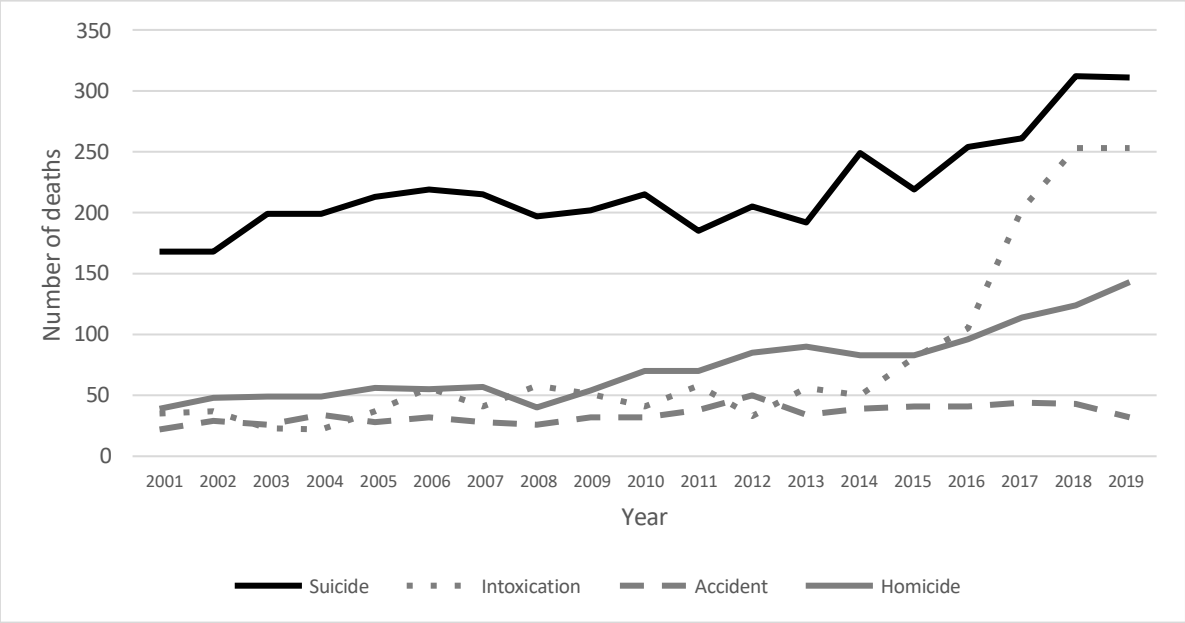
Figure 4. *Mortality rate per 100,000 individuals in state prisons, by manner of death: 2001–2019*



Source: BJS, Mortality in Correctional Institutions, 2001–2019.

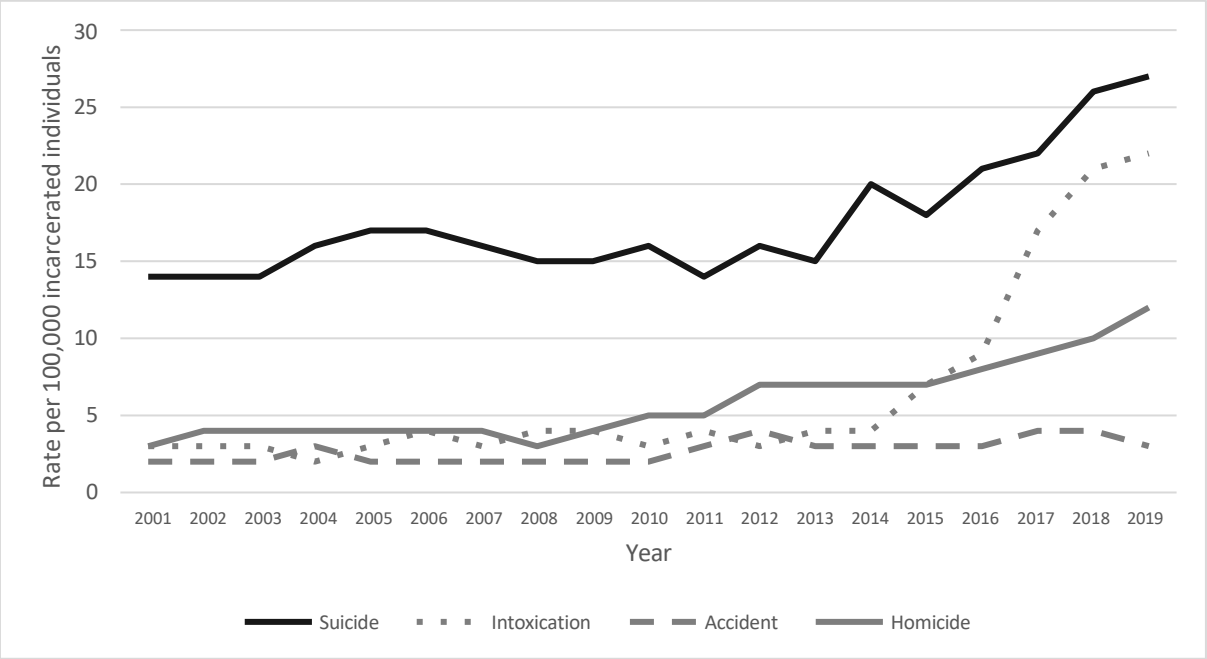
This decline in the percentage of all state prison deaths attributed to illness is due in part to increases in the number of suicides and intoxication-related deaths. The number of suicides remained relatively stable from 2001 through 2013 but then climbed 63%, from 192 in 2013 to a high of 312 in 2018 (Figure 5). The rate of suicide followed a similar pattern over time, remaining flat from 2001 through 2013 before rising to a high of 27 per 100,000 individuals incarcerated by the state in 2019 (Figure 6).

Figure 5. *Number of state prisoner deaths, by manner of death excluding illness: 2001–2019*



Source: BJS, Mortality in Correctional Institutions, 2001–2019.

Figure 6. *Mortality rate per 100,000 individuals in state prisons, by manner of death excluding illness: 2001–2019*

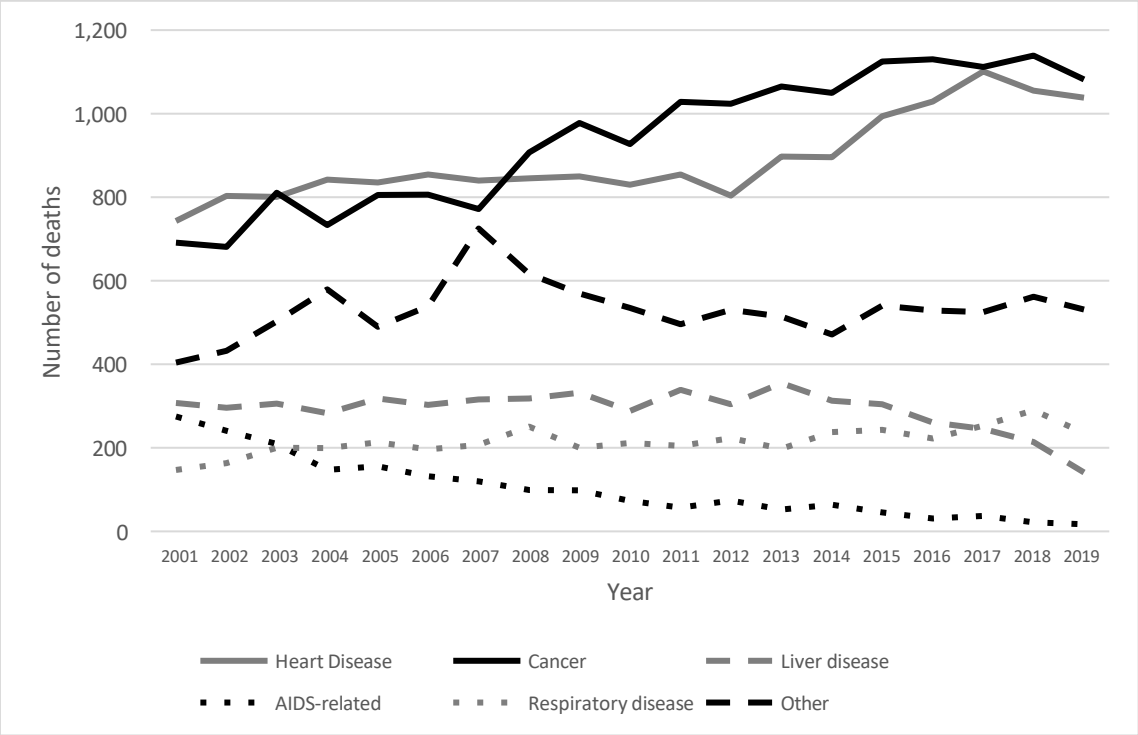


Source: BJS, Mortality in Correctional Institutions, 2001–2019.

The number and rate of deaths caused by drug or alcohol intoxication followed a pattern similar to that of suicide, with the greatest increase having occurred in the past 5–6 years (Figures 5 and 6). Thirty-five individuals were reported to have died by intoxication in state prisons in 2001. This number increased 623%, to a high of 253, in 2018 and 2019. Most of this increase occurred between 2014 and 2019, a 406% increase. Similarly, from 2001, the rate of intoxication deaths increased sevenfold, from 3 per 100,000 to 22 per 100,000 in 2019. Homicides in state prisons have also increased significantly over time, by 267%, but more gradually than suicide and intoxication deaths.

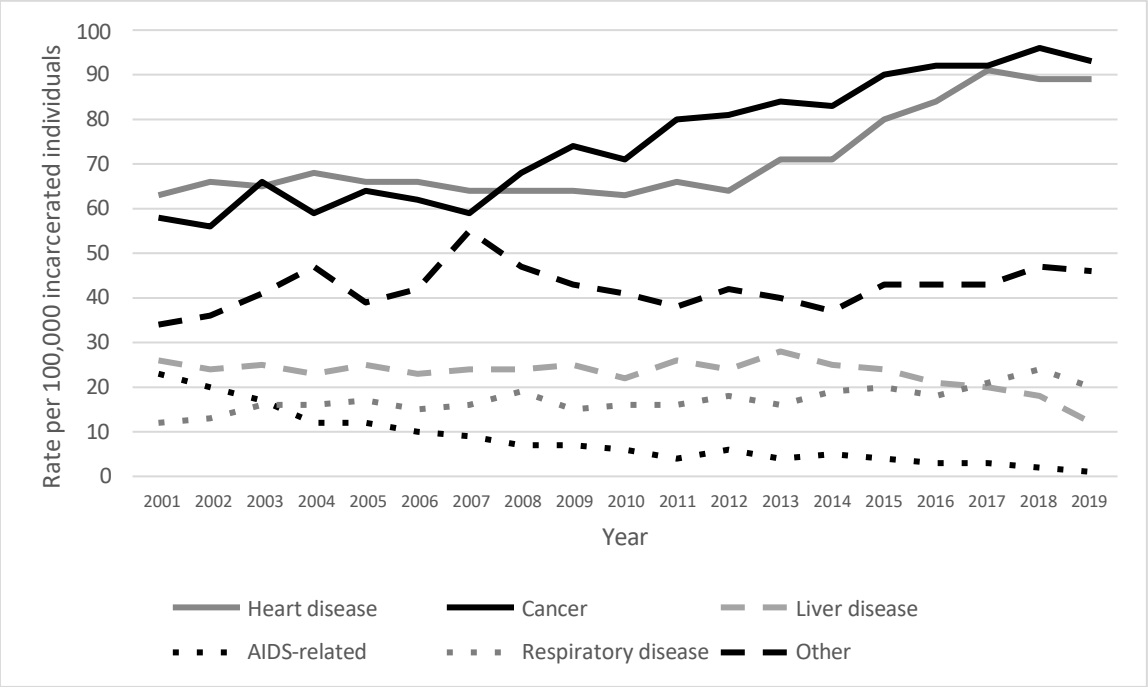
Among specific illnesses, cancer and heart disease are the leading causes of natural death (Figures 7 and 8). The number of individuals incarcerated by the state who die from cancer has shown a gradual increase over time, whereas the number of those who die from heart disease remained relatively flat between 2001–2012 before sharply rising to a high of 1,112 in 2017. Numbers for other diseases have remained somewhat flat, with the one exception being AIDS-related diseases. AIDS-related deaths among persons incarcerated by the state have fallen steadily since 2001, from a high of 275 deaths in 2001 to a low of 17 in 2019.

Figure 7. *Number of illness-related deaths among individuals incarcerated by the state, by cause of death: 2001–2019*



Source: BJS, Mortality in Correctional Institutions, 2001–2019.

Figure 8. *Mortality rate per 100,000 individuals in state prisons, by cause of death: 2001–2019*



Source: BJS, Mortality in Correctional Institutions, 2001–2019.

Summary of the Prevalence and Manners of Deaths in Prisons

- The number of individuals who died while in the custody of state prisons declined 7% from 2018 (4,137 deaths) to 2019 (3,853 deaths).
- In 2001, the mortality rate in state prisons was 242 for every 100,000 incarcerated individuals. Beginning in 2010, the mortality rate increased every year, to a high of 347 per 100,000 in 2018, before declining to 330 in 2019.
- The predominant manner of death in state prisons is natural death caused by illness, followed by suicide and intoxication.
    - Cancer and heart disease are the primary illness-related causes of death.
    - AIDS-related deaths have fallen steadily since 2001, from a high of 275 deaths in 2001 to a low of 17 in 2019.
- State prison deaths caused by suicide, drug or alcohol intoxication, and homicide have increased significantly over time, and most of the increase has occurred during the past 5–6 years.
    - The suicide mortality rate increased from 14 per 100,000 incarcerated individuals in 2001 to a high of 27 in 2018.
    - Deaths due to intoxication increased from a rate of 3 per 100,000 incarcerated individuals in 2001 to 22 in 2019.
    - Deaths caused by homicide increased from a rate of 3 per 100,000 incarcerated individuals in 2001 to 12 in 2019.

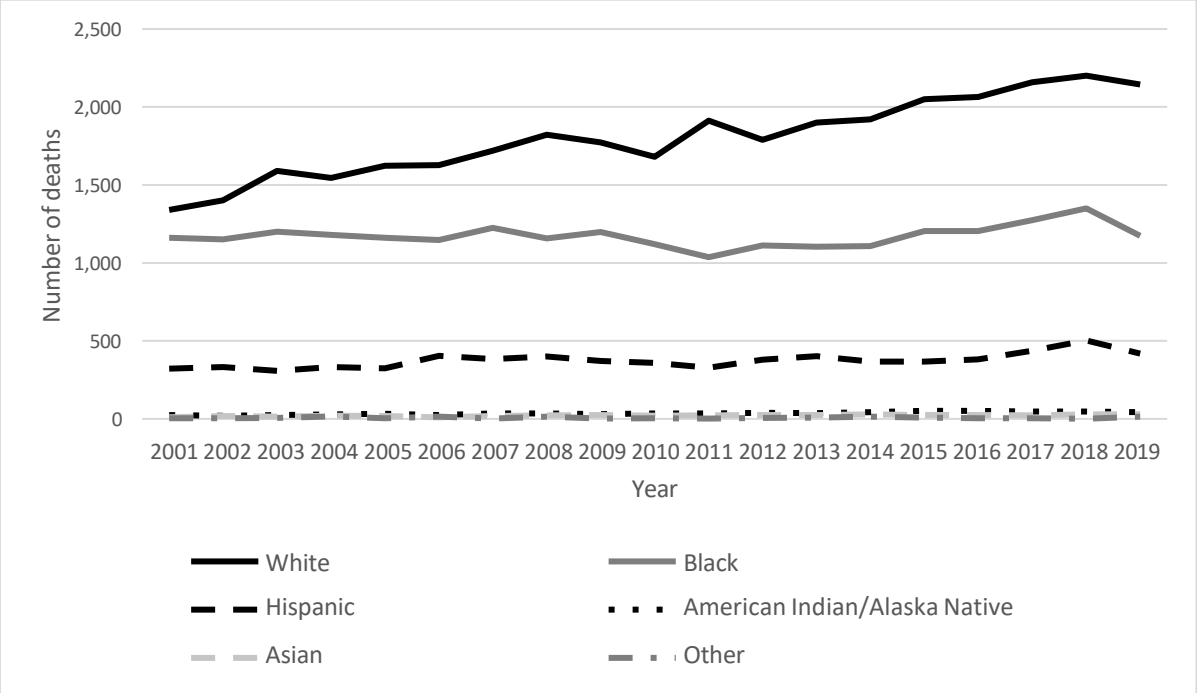
Who Dies in Prison?

Race and Ethnicity

White individuals accounted for the largest number of deaths in prison across the entire period examined, and this number increased by 60% from 2001 to 2019 (Figure 9).[6] The number of White individuals who died in prison in 2001 was 1,340, rising to a high of 2,201 in 2018 before falling to 2,144 in 2019. When the size of the prison population is accounted for, White individuals incarcerated in state prisons had a higher mortality rate than Black and Hispanic individuals each year from 2001 to 2019, and this disparity grew over time (Figure 10). For example, in 2001, White incarcerated individuals had a mortality rate of 333 per 100,000 incarcerated individuals compared with 226 for Black individuals, a 1:5 White-to-Black death ratio. In 2019, the mortality rate for White individuals was 581 deaths per 100,000; for Black individuals it was 309, a 1:9 White-to-Black death ratio. The mortality rate for other race and ethnic groups appeared to increase between 2001 and 2019, yet some groups experienced starker increases than others. In particular, the rate of Hispanic individuals dying in state prisons increased by nearly 12% during this period, while the rate of American Indian/Alaska Native individuals dying in state prisons increased by more than 125%, and the mortality rate for Asian individuals increased by more than 400% (from 34 per 100,000 population to 174 per 100,000 population). Importantly, the American Indian/Alaska Native population in state prison was dying at a rate second only to that of White individuals in 2015, with a mortality rate of 302 per 100,000 population, or 52 deaths during that year.

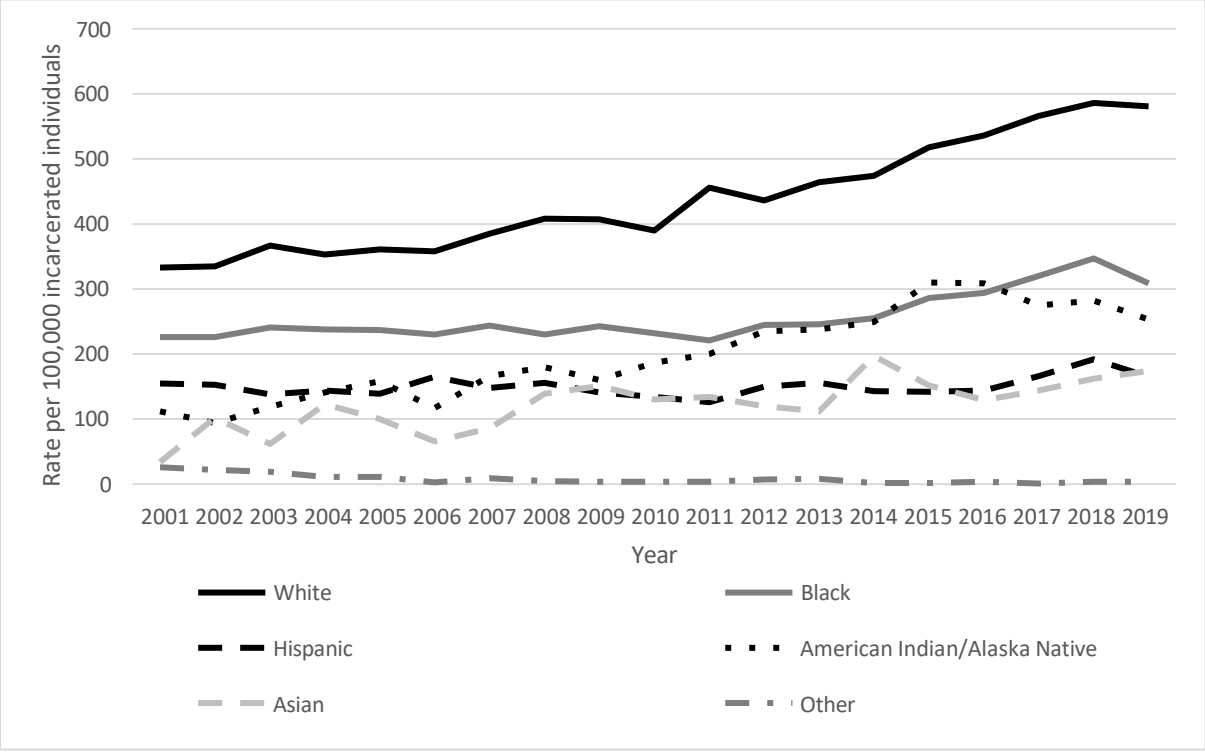
[6] Race/ethnicity are based on administrative reports and do not necessarily reflect how an incarcerated individual might self-identify. Eppler-Epstein et al. (2016) showed that 40 states reported race (e.g., "White," "Black," "other") in their arrest records, but only 15 states reported ethnicity. Furthermore, states that use just "Black" or "White" labels likely classify Latino persons as "White."

Figure 9. *Number of state prison deaths, by race/ethnicity: 2001–2019*



Source: BJS, Mortality in Correctional Institutions, 2001–2019.

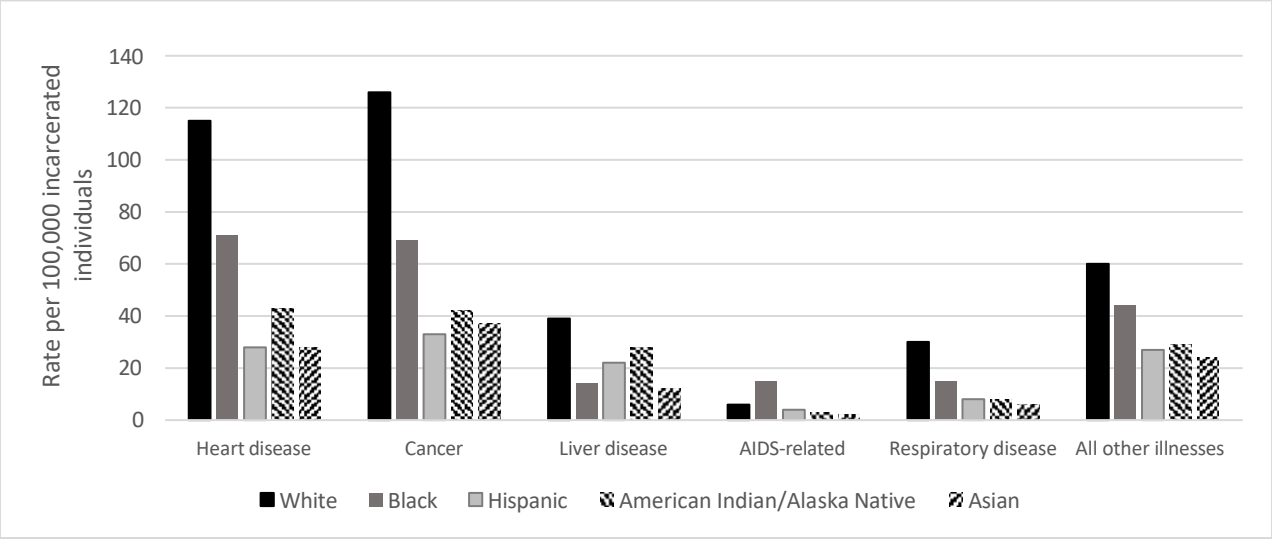
Figure 10. *Mortality rate per 100,000 individuals in state prisons, by race/ethnicity: 2001–2019*



Source: BJS, Mortality in Correctional Institutions, 2001–2019.

Illness-related deaths drove the overall disparities between White individuals and other races and ethnicities. Compared with all other race/ethnicity categories, White individuals confined in prison had higher mortality rates for all illness-related deaths, including heart disease, cancer, liver disease, and respiratory disease (Figure 11). The only exception was deaths caused by AIDS, for which Black individuals had a higher mortality rate.

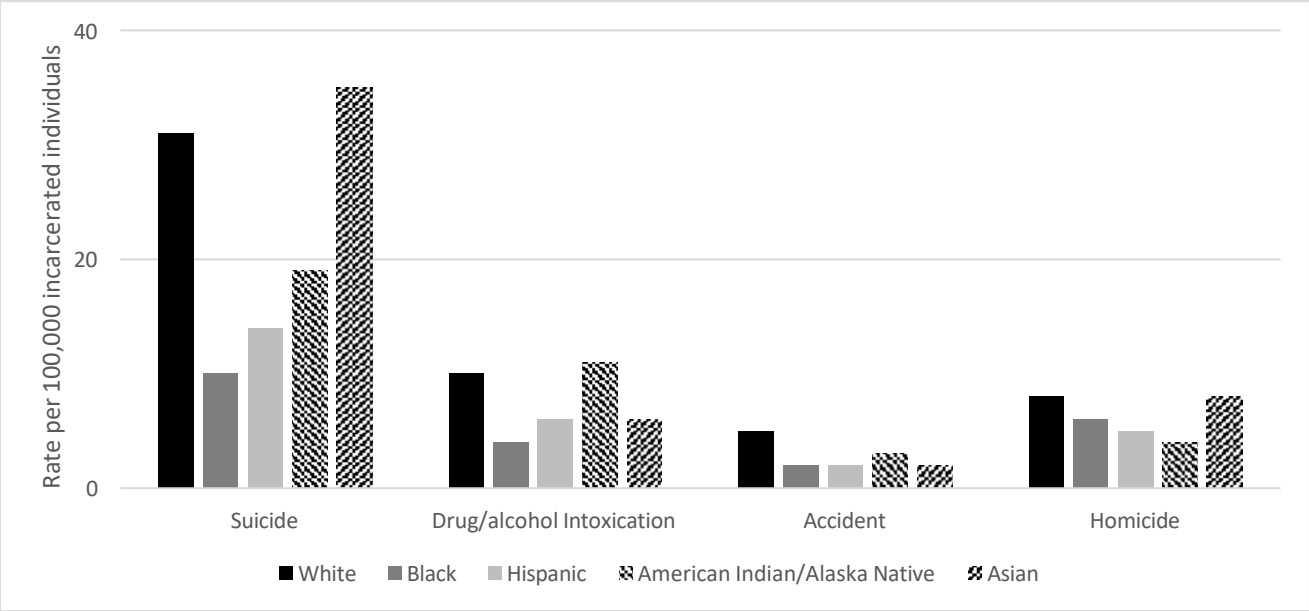
Figure 11. *Mortality rate per 100,000 individuals in state prisons, by illness and race/ethnicity: 2001–2019*



Source: BJS, Mortality in Correctional Institutions, 2001–2019.

Furthermore, White individuals in state prisons experienced higher rates for suicide, intoxication-related deaths, and homicide than Black and Hispanic individuals (Figure 12). White individuals had a suicide mortality rate of 31 per 100,000, compared with 10 per 100,000 for Black individuals and 14 for Hispanic individuals. Asian individuals exceeded all other race and ethnic groups with a suicide mortality rate of 35 per 100,000 population between 2001–2019. It is important to note that this high suicide mortality rate for Asian individuals is due in part by the relatively small number of Asian individuals in state prisons. During this period, there were 89 suicides for Asian individuals compared with 2,444 for White individuals. For drug and alcohol intoxication deaths, American Indian/Alaska Native individuals in state prisons had the highest mortality rate at 11 deaths per 100,000. White individuals had a mortality rate of 10 intoxication deaths per 100,000, compared with 4 for Black individuals and 8 for Hispanic individuals. Similarly, White individuals had a higher homicide rate than Black and Hispanic individuals, yet the same mortality rate as Asian individuals at 8 homicide deaths per 100,000 population.

Figure 12. *Mortality rate per 100,000 individuals in state prisons, by race/ethnicity and manner of death other than illness: 2001–2019*

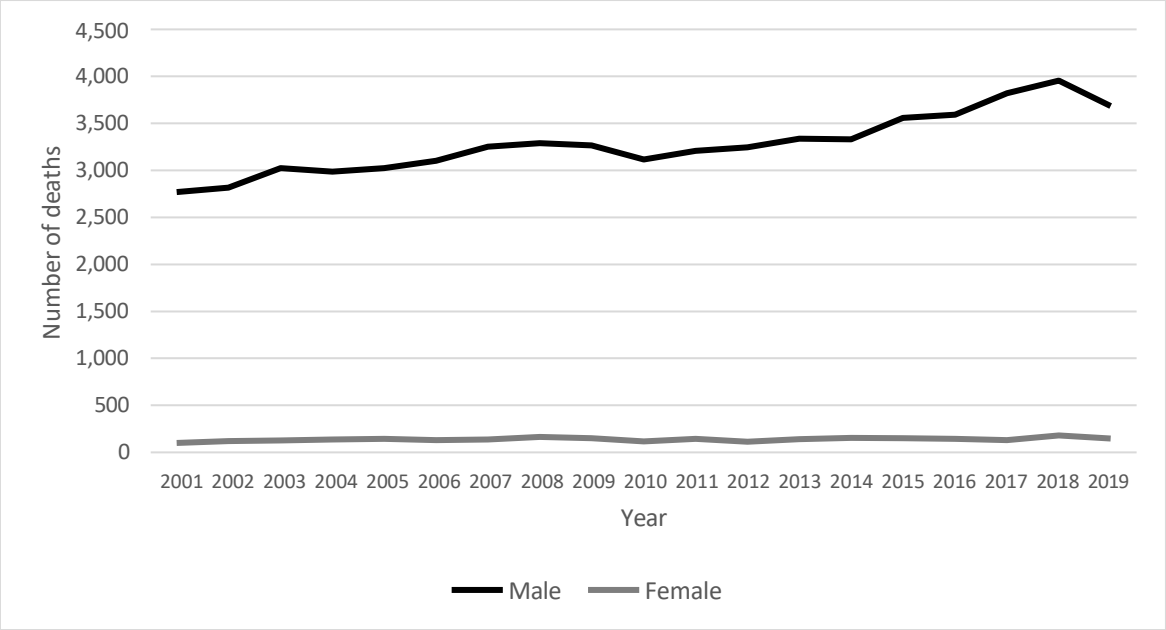


Source: BJS, Mortality in Correctional Institutions, 2001–2019.

Sex

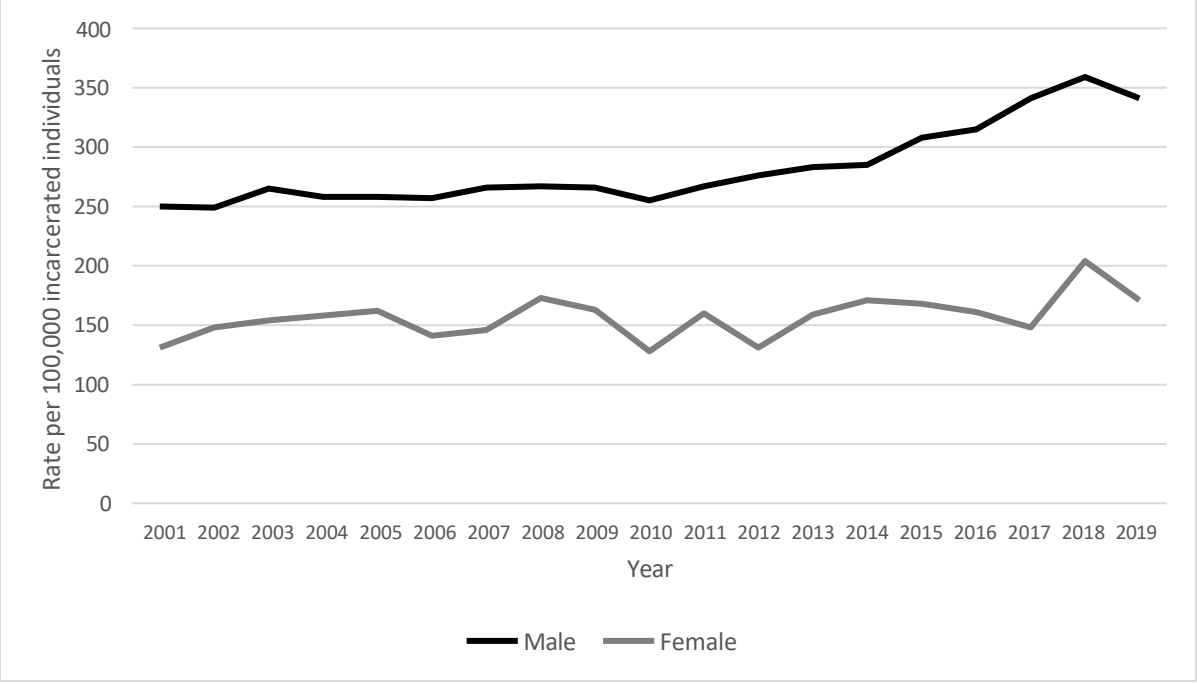
In 2019, men accounted for approximately 96% of all prison deaths, with 2,769 deaths compared with 119 for women (Figure 13). This large difference was consistent over the entire period 2001–2019. Although men make up a larger share of the jail population, an examination of the mortality rate shows that a significant difference between male and female individuals persists and that it increased over time (Figure 14).

Figure 13. *Number of incarcerated individual deaths, by sex: 2001–2019*



Source: BJS, Mortality in Correctional Institutions, 2001–2019.

Figure 14. *Mortality rate per 100,000 individuals in state prisons, by sex: 2001–2019*



Source: BJS, Mortality in Correctional Institutions, 2001–2019.

The higher male mortality rate is consistent for all manners of death (Figure 15). Men have higher rates for all illness-related deaths, including heart disease, cancer, and liver disease. Men also have significantly higher rates for suicide, intoxication-related deaths, and homicide while

in prison. For accidents and AIDS-related deaths, male and female individuals share similar rates.

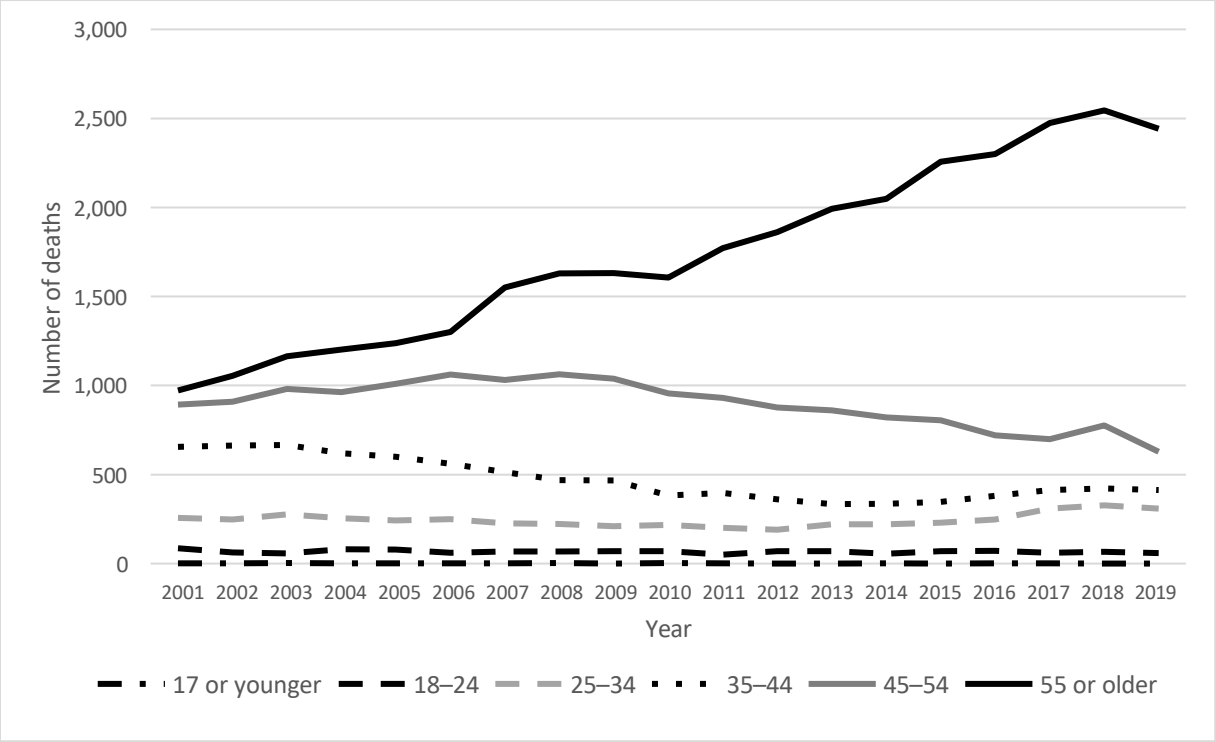
Figure 15. *Mortality rate per 100,000 individuals in state prisons, by sex and manner of death: 2001–2019*

Source: BJS, Mortality in Correctional Institutions, 2001–2019.

Age

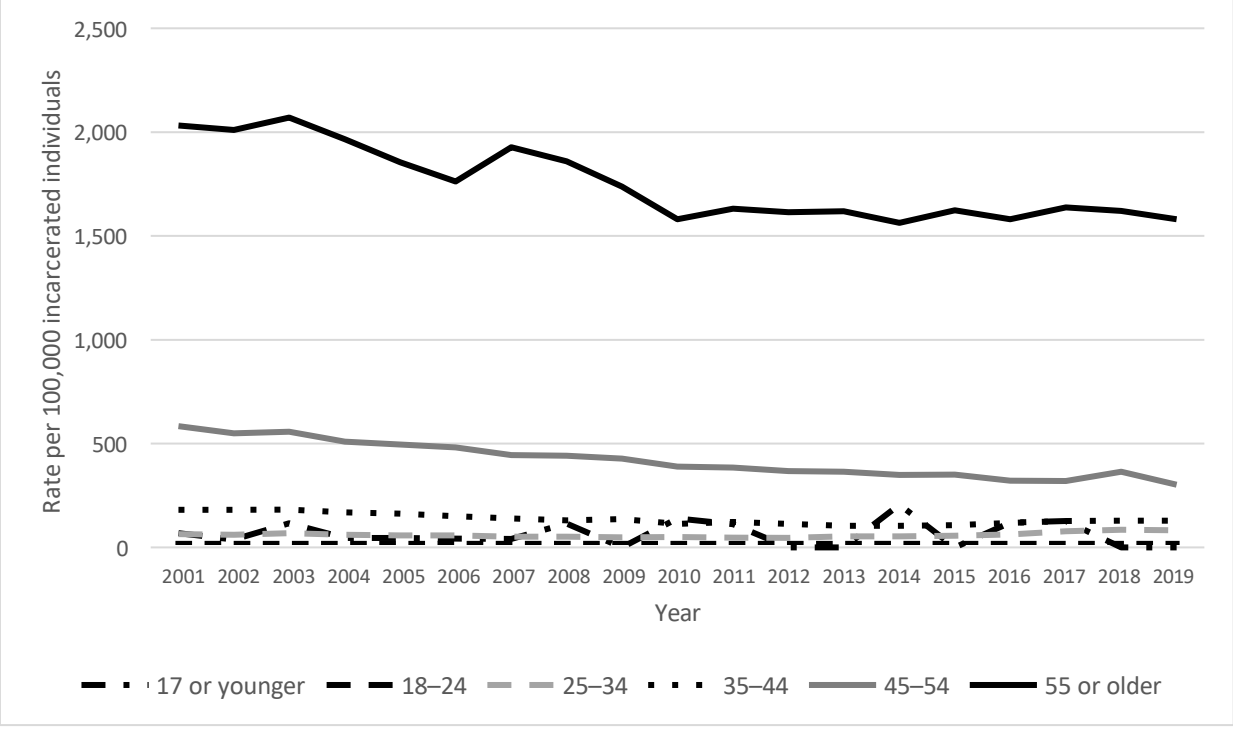
The age at time of death has shifted significantly over the years for individuals who died in state prisons. Beginning in 2001, the number of individuals ages 55 or older dying in prison increased; it increased sharply starting in 2011 (972 deaths) to a high of 2,545 in 2018 before declining slightly in 2019 (Figure 16). Meanwhile, in 2001, individuals ages 45–54 had about the same number of deaths as individuals 55 and older (972 deaths) but that number has declined over time to a low of 628 in 2019. These trends can be explained by the changes in incarcerated individuals' ages over time; the prison population is growing older. Mortality rates for individuals ages 55 or older were almost four times as high as for other age groups in 2001, and this large difference has been consistent or grown over time.

Figure 16. *Number of deaths of incarcerated individuals, by age: 2001–2019*



Source: BJS, Mortality in Correctional Institutions, 2001–2019.

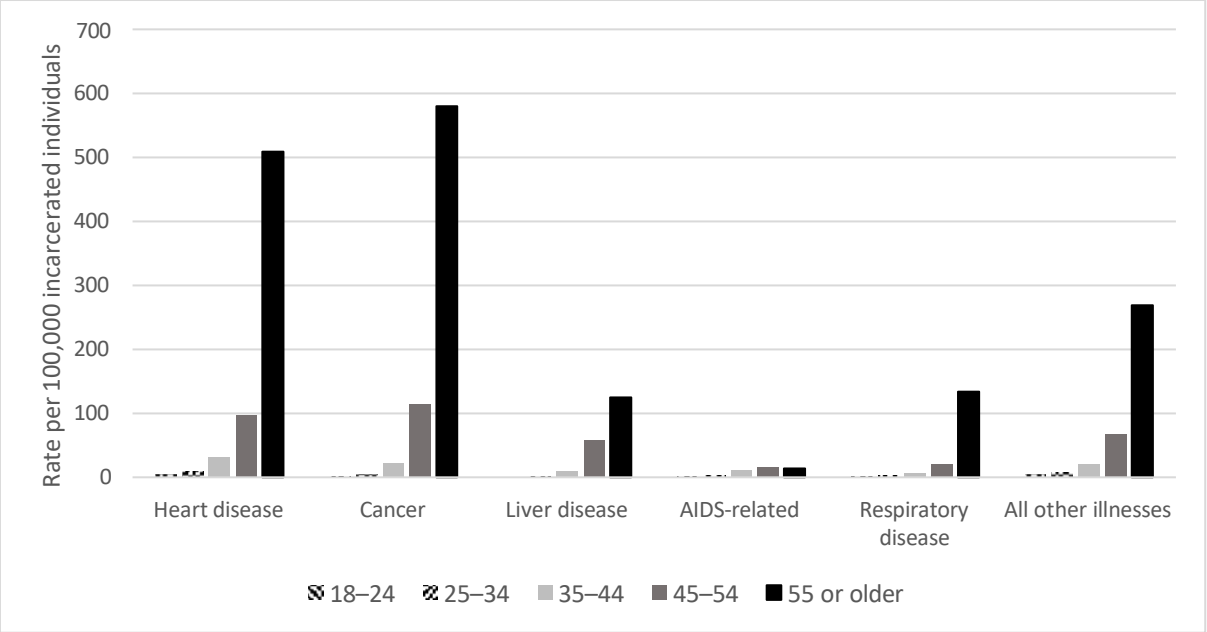
Figure 17. *Mortality rate per 100,000 people in state prisons, by age: 2001–2019*



Source: BJS, Mortality in Correctional Institutions, 2001–2019.

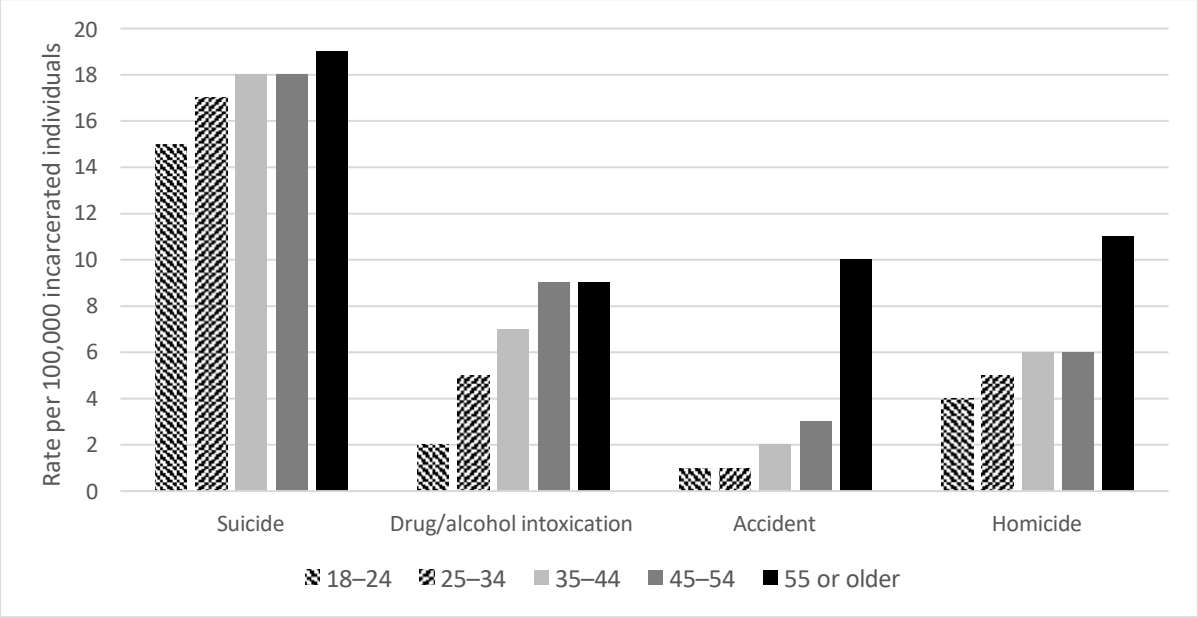
The primary manner of death for incarcerated individuals ages 55 or older was illness, primarily heart disease and cancer (Figure 18). Among cancer patients, the mortality rate for individuals 55 or older was 580 per 100,000, compared with 114 for individuals 45–54, the group with the second highest rate. The mortality rate for suicides, drug or alcohol intoxication deaths, accidents, and homicides also increased with age (Figure 19).

Figure 18. *Mortality rate per 100,000 people in state prisons, by age and illness: 2001–2019*



Source: BJS, Mortality in Correctional Institutions, 2001–2019.

Figure 19. *Mortality rate per 100,000 people, by age and manner of death other than illness: 2001–2019*



Source: BJS, Mortality in Correctional Institutions, 2001–2019.

Summary of the Characteristics of Individuals Who are Dying in State Prisons

- White individuals accounted for the largest number of deaths in state prisons and had a higher mortality rate than Black and Hispanic individuals, and this disparity grew over time. Although Asian and American Indian/Alaska Native individuals account for 1% of all prison deaths, their mortality rates equal or exceed other race/ethnic groups.
    - Illness-related deaths account for a large proportion of the overall disparities between deaths among White individuals and deaths among people of other races/ethnicities.
    - White individuals also had higher rates for suicides, intoxication-related deaths, and homicides than Black and Hispanic individuals in state prisons.
- Males accounted for approximately 96% of all prison deaths in 2019 with 2,769 deaths, compared with 119 for females. The mortality rate for males was significantly higher than for females, and that difference increased over time and was higher for all manners of death (e.g., illness, suicide, intoxication, and homicide).
- The number of older persons dying in prisons has increased over time.
    - Beginning in 2001, the number of persons ages 55 or older dying in prison increased; it rose sharply starting in 2011 (972 deaths) and reached a high of 2,545 in 2018.
    - Similarly, the mortality rate for older persons was much greater than for other age groups. Older persons have much higher rates of death due to illness, such as cancer and heart disease.

State Prison Facility Characteristics

Methods

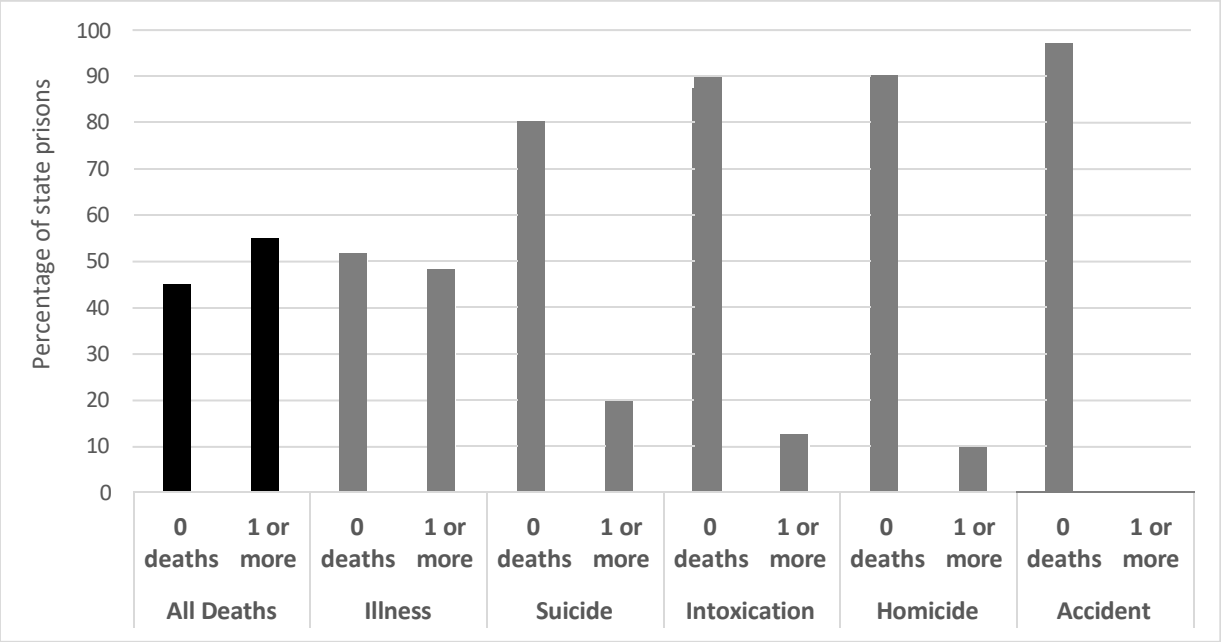
The type and characteristics of the prison facility may reveal factors associated with a higher or lower risk for in-custody prison deaths. RTI linked decedent information from the 2019 BJS Mortality in State and Federal Prisons to prison confinement facilities from the 2019 Census of State Adult Correctional Facilities in which the deaths occurred. RTI used these linked data to examine the distribution of deaths by several facility characteristics, including size, capacity, operator, purpose, function, program offerings, and population characteristics.

In 2019, 55% of all state prison facilities[7] reported one or more deaths. When specific manners of death are examined, we find that most prisons did not report a single suicide, intoxication, homicide, or accidental death in any year. In 2019, 82% of prisons had zero suicides, 87% had

[7] Percentages calculated from the total of 1,049 state confinement facilities, including 951 state-run facilities, 16 joint state and locally run facilities, and 82 private facilities. One facility reporting 0 population in the 2019 Census of Adult State and Federal Correctional Facilities was excluded from these calculations.

zero intoxication deaths, 91% had zero homicides, and 97% had zero fatal accidents (Figure 20; Table 1).

Figure 20. *Percentage of state prison facilities by number of deaths, by manner of death: 2019*



Source: BJS, Mortality in Correctional Institutions, 2019; Census of Adult State and Federal Correctional Facilities, 2019.

Several facility characteristics were associated with higher mortality rates, and these differed by manner of death. However, many of the associations discussed below are complicated and may be confounded by other factors, making interpretations somewhat difficult. For example, differences in mortality rates for prison facilities that are operated by the state and those that are operated by a private organization contracted by the state could be driven by other factors, such as differences in staffing ratios or the incarcerated population. Furthermore, it is important to note that the use of private prisons varies greatly across states as well as the policies that dictate which individuals go to private versus state prisons. There is some evidence that individuals incarcerated in private prisons tend to be less violent, have fewer medical and mental health needs, and are incarcerated for shorter periods than those housed in public prisons (e.g., Burkhardt, 2017). Although the differences between state and private operators are real and point to possible risk factors, these other explanatory factors need to be considered.

Facility Operations and Capacity Levels

State-operated prison facilities had significantly higher mortality rates than privately operated prisons (Table 1). Although there are many fewer privately operated prisons, these facilities have lower mortality rates for natural, homicide, suicide, and intoxication deaths. For example,

state-operated facilities had a suicide rate of 27.4 per 100,000 individuals, whereas in privately run facilities the rate was 13.5. Facilities authorized to house only men had much higher mortality rates for homicide, suicide, and intoxication than women-only facilities. The mortality rate for deaths caused by intoxication was 22.2 per 100,000 individuals confined in male-only facilities and 2.6 for those in female-only facilities.

Prison facility security level is related to several types of death. Super- and high-maximum prisons were more likely than medium- and low-security prisons to have homicides, suicides, and intoxication deaths. Over-capacity facilities tended to have higher mortality rates for accidents, intoxication deaths, and suicides than those operating under capacity. No differences by capacity were detected for natural deaths or homicides.

Facilities that were currently under a court order or consent decree tended to have higher mortality rates for unnatural deaths. This association is more reflective of the conditions that led to the use of the court order or consent decree process than of the impact of those processes themselves.

Table 1. *Mortality rate per 100,000 people in state prisons, by selected facility characteristics: 2019*

Characteristic	No. of Facilities	Natural	Accident	Intoxication	Homicide	Suicide
Private/Public						
State authority	952	258	2.9	20.6	12.8	27.4
Joint state and local authority	16	248.4	0	31.8	2.9	20.2
Private contractor	82	83.3	0	14.6	9	13.5
Sex Authorized to House						
Males only	873	225.5	2.4	22.2	13.5	27.6
Females only	102	159.8	3.9	2.6	0	10.3
Both males and females	74	723.6	3.7	13	5.6	20.4
Missing	1	0	0	0	0	0
Physical Security Level						
Super-maximum, maximum, administrative	326	335.1	4	32.9	22.2	44.2
Medium	397	207.9	2.2	13.7	7.6	16.9
Minimum/low	248	96	0.7	3.3	1.3	5.2
Other, none, unknown	79	228.6	1.1	22.6	4.3	18.3
Capacity Level						
Over capacity	206	248.9	4.6	32.3	13.5	31.6
At capacity	11	389.1	0	0	0	29.9
Under capacity	700	248.3	2.1	16.2	12	24.3
Capacity unknown	132	203.7	0.8	17.9	10.9	23.3
Missing	1	0	0	0	0	0
Under Court Order/Consent Decree						
Yes	227	220.3	3.5	34.6	17.6	29.3

Characteristic	No. of Facilities	Natural	Accident	Intoxication	Homicide	Suicide
No	799	258.1	2.4	15.8	10.6	25.4
Missing	24	34.1	0	21.3	4.3	12.8

Note: One facility was missing the total population, so rates per population could not be calculated for this facility.
Source: BJS, Mortality in Correctional Institutions, 2019; Census of Adult State and Federal Correctional Facilities, 2019.

Prison facilities may serve different functions but have one primary function, such as general confinement or medical treatment or hospitalization. This report examines the rate of deaths occurring in prison facilities by the primary function as reported by the facility. Several facility functions were associated with higher mortality rates (Table 2). For natural deaths/illness, prison facilities equipped to address age-related diseases such as cancer and heart disease had higher rates for these types of death. Facilities that offered geriatric care, medical treatment, or mental health as their primary function had higher mortality rates for natural death than did facilities where these were not the primary function. Similarly, intoxication deaths appeared more pronounced in facilities that provided geriatric care or mental health treatment, along with those primarily serving youthful populations. Higher suicide rates were found in facilities where the primary function was to provide medical treatment or to serve youthful offenders. These associations suggest that facilities develop or adopt programs aligned with the needs of the population they serve or individuals with certain needs are assigned to facilities with certain services.

Table 2. *Mortality rate per 100,000 people in state prisons, by selected facility characteristics: 2019*

Characteristic	No. of Facilities	Natural	Accident	Intoxication	Homicide	Suicide
Confinement Type						
Confinement	1,050	244.3	2.6	20.5	12.2	26.1
Major Primary Facility Functions						
General adult population	875	223.9	2.6	21.2	12.5	25.8
Alcohol/drug treatment	49	113.1	0	4.7	0	14.1
Reception/ diagnostic	41	378.4	4	10.1	12.1	34.4
Medical treatment	12	2172.2	0	15.5	31	62.1
Mental health	21	773.3	5.9	46.9	5.9	23.4
Boot camp	6	0	0	0	0	0
Primarily returned to custody	2	97.3	0	0	0	0
Primarily youthful offenders	6	121.5	0	121.5	0	40.5
Geriatric care	3	532.9	0	35.5	0	0

Characteristic	No. of Facilities	Natural	Accident	Intoxication	Homicide	Suicide
Other care	35	105.7	0	3	12.1	27.2

Source: BJS, Mortality in Correctional Institutions, 2019; Census of Adult State and Federal Correctional Facilities, 2019.

Facility Population Characteristics

Certain characteristics of the population confined in state prisons were associated with various mortality rates. Larger facility populations had higher rates of death by intoxication and suicide but no consistent pattern for natural deaths, accidents, or homicides (Table 3).

Prisons with a larger percentage of White individuals tended to report fewer intoxication and homicide deaths but more natural deaths. As the percentage of the White prison population increased from 29% to 54% (lowest quarter to the highest quarter), the intoxication mortality rate declined from 28.5 per 100,000 to 7.3. Similarly, the homicide mortality rate declined from 17 per 100,000 to 4. Conversely, as the percentage of the Black population increased from 29% to 55% (lowest to highest quarter), the intoxication mortality rate increased from 11 per 100,000 to 28 and the homicide rate from 4 to 25.

A key facility characteristic is the ratio of the number of security staff employed to the number of individuals incarcerated. Having a large number of staff for each individual confined could increase surveillance, reducing suicide, drug or alcohol use, and assault. However, the security staff–to–confined individual ratio was not clearly associated with the mortality rate for intoxication, suicide, or homicide deaths.

The percentage of the prison population in restrictive housing was associated with higher mortality rates for homicide, suicide, and intoxication deaths. As with other associations, it is unclear whether the use of restrictive housing increases the risk for such deaths or occurs more often with populations most at risk for these deaths.[8]

Table 3. *Mortality rate per 100,000 people in state prisons, by selected facility characteristics: 2019*

Characteristic	No. of Facilities	Natural	Accident	Intoxication	Homicide	Suicide
Facility Size (population)						
Missing	1	0	0	0	0	0
Q1: <912 individuals	508	289.6	2.8	7.9	5.6	16.3
Q2: 912 to <1,302 individuals	199	219.2	2.3	21.6	16.6	23.9
Q3: 1,302 to <1,888 individuals	179	222.9	2.5	18.5	15.2	32.3

[8] The data do not demonstrate where deaths occur within a facility, including whether the death occurred in restrictive housing.

Characteristic	No. of Facilities	Natural	Accident	Intoxication	Homicide	Suicide
Q4: >1,888 individuals	163	248	2.7	27.2	11.4	28
Ratio of Security Staff to Confined Individuals						
Missing	66	126	0	14.9	2.1	12.8
Q1: <2.9	284	393.8	4.2	30.8	13.5	30
Q2: 2.9 to <3.7	203	213.6	0.9	15.3	10.1	30.6
Q3: 3.7 to <5.0	275	211.9	2.1	21.9	8.1	21.6
Q4: >5	222	190.4	3.5	14.6	19.1	26.5
% Non-Hispanic White						
Missing	24	77.6	0	33.3	5.5	16.6
Q1: <29%	237	154.6	2.9	28.5	17	25.9
Q2: 29% to <40%	239	289.4	3.5	22.3	14.3	31.4
Q3: 40% to <54%	254	273.1	1.9	19.6	11.7	28
Q4: 54%+	296	296.9	2	7.3	4.1	19
% Non-Hispanic Black						
Missing	24	77.6	0	33.3	5.5	16.6
Q1: <29%	357	189.6	2.3	10.7	4.3	17.3
Q2: 29% to <44%	249	278.4	2.2	23.4	11.4	25.6
Q3: 44% to <55%	204	312.7	3.9	22.1	12.6	35.6
Q4: 55%+	216	223.7	2.5	28.2	24.9	31.2
% Hispanic						
Missing	24	77.6	0	33.3	5.5	16.6
Q1: <2%	231	334.9	1.6	24.8	21.6	24.8
Q2: 2% to <7%	249	260.1	3.8	21.3	12.6	28.6
Q3: 7% to <16%	229	192.7	2.6	13.6	9.4	24.7
Q4: 16%+	317	231.5	2.4	21.3	9.9	26.3
% U.S. Citizen						
Missing	160	188	2.5	35.3	11.4	24.4
Q1: <91%	238	206.8	3	16.2	14.7	25.6
Q2: 91% to <95%	173	258.7	3	16.1	15.7	31
Q3: 95% to <98%	184	311.3	4.3	20.9	9.7	27.9
Q4: 98%+	295	276.5	0.4	14.3	8.7	22.1
Total Individuals in Restrictive Housing						
Missing	115	199.3	2.8	43.9	13.9	26.1
Q1: <2%	464	240.9	1.7	7.2	5.5	11.3
Q2: 2% to <4%	144	189.4	1.8	13	7.1	25.4
Q3: 4% to <10%	170	317.8	5	13.1	15.3	34.2
Q4: 10%+	157	254.6	2.2	36.4	22.4	42.7

Source: BJS, Mortality in Correctional Institutions, 2019; Census of Adult State and Federal Correctional Facilities, 2019.

Special and Educational Programs Offered to Individuals Confined in State Prisons

Many state prisons offer a wide variety of special programs to individuals confined to these facilities that focus on drug and alcohol use, anger management, psychological counseling, and building life skills (Table 4). Additionally, facilities may offer formal educational programs focusing on literacy, language, high school and college courses, special education, and vocational training (Table 5). These programs work to reduce behavioral issues, improve prosocial behaviors and functional skills, and prepare individuals for reentry. However, it is important to keep in mind that although many facilities offer a variety of programs to serve different needs, this does not mean every program is widely or always available, nor does it necessarily mean that individuals in prison will participate in the program.

Very few consistent patterns emerge between program offerings and mortality rates (Table 4). Facilities with alcohol and drug dependency awareness programs were associated with higher rates of intoxication deaths than facilities without these programs. Like facility functions, these programs may be aligned and allocated to the populations most in need.

Table 4. *Mortality rate per 100,000 people in state prisons, by selected facility characteristics: 2019*

Special Program	No. of Facilities	Natural	Accident	Intoxication	Homicide	Suicide
Drug Dependency Awareness						
No	214	256.7	3.5	14.1	13.2	24.6
Yes	807	248	2.4	22.1	12.2	27
Missing	29	37	0	20.2	3.4	10.1
Alcohol Dependency Awareness						
No	217	237.6	2.2	13.5	11.7	22
Yes	804	252.8	2.8	22.2	12.6	27.7
Missing	29	37	0	20.2	3.4	10.1
Psychological Counseling						
No	411	214.5	3.6	18.3	11.1	20.9
Yes	610	268.3	2.2	21.7	13.1	29.5
Missing	29	37	0	20.2	3.4	10.1
HIV/AIDS Counseling						
No	554	247.7	3.3	23.9	13.8	26.5
Yes	467	251.9	2	16.9	11	26.6
Missing	29	37	0	20.2	3.4	10.1
Sex Offender Counseling						
No	715	230.4	2.4	24.9	12.3	22.9
Yes	306	289.2	3.2	11.6	12.7	34
Missing	29	37	0	20.2	3.4	10.1

Special Program	No. of Facilities	Natural	Accident	Intoxication	Homicide	Suicide
Anger Management						
No	358	264.1	2.8	15.4	13.9	22.7
Yes	663	244.1	2.6	22.5	11.9	28
Missing	29	37	0	20.2	3.4	10.1
Employment						
No	337	259	2.3	20.9	11.8	20.6
Yes	684	245.5	2.8	20.3	12.7	29.3
Missing	29	37	0	20.2	3.4	10.1
Life Skills						
No	276	244.9	2.7	13.7	12.1	22
Yes	745	251.2	2.7	22.6	12.5	27.9
Missing	29	37	0	20.2	3.4	10.1
Parenting Skills						
No	463	275.2	2.3	18.4	14.8	28.2
Yes	558	231	2.9	22.1	10.6	25.3
Missing	29	37	0	20.2	3.4	10.1

Source: BJS, Mortality in Correctional Institutions, 2019; Census of Adult State and Federal Correctional Facilities, 2019.

Table 5. *Mortality rate per 100,000 people in state prisons, by selected facility characteristics: 2019*

Educational Program	No. of Facilities	Natural	Accident	Intoxication	Homicide	Suicide
Literacy Training						
No	181	487.8	5.6	8.5	19.7	18.3
Yes	839	233.3	2.5	21.3	11.9	27.1
Missing	30	53.8	0	20.2	3.4	10.1
Upper Basic Adult Education						
No	216	456	3.6	11.7	20.6	25.1
Yes	804	226.6	2.6	21.5	11.5	26.7
Missing	30	53.8	0	20.2	3.4	10.1
Secondary Education or GED						
No	145	565.2	7.6	10.6	27.3	21.3
Yes	875	229.7	2.4	21.1	11.5	26.9
Missing	30	53.8	0	20.2	3.4	10.1
Special Education						
No	520	246.7	2.7	22.2	15.6	24.5
Yes	500	251.2	2.6	19.3	10.1	28
Missing	30	53.8	0	20.2	3.4	10.1
English as a Second Language						

Educational Program	No. of Facilities	Natural	Accident	Intoxication	Homicide	Suicide
No	697	276.8	2.5	22.2	15.5	24.4
Yes	323	205.5	3	17.7	7.6	29.9
Missing	30	53.8	0	20.2	3.4	10.1
Vocational Training						
No	317	353.8	2.5	21.1	20.1	27
Yes	703	226.2	2.7	20.4	10.7	26.4
Missing	30	53.8	0	20.2	3.4	10.1
College Courses						
No	574	241.4	2.8	19.3	15.3	28.4
Yes	446	256.3	2.5	21.6	9.9	24.9
Missing	30	53.8	0	20.2	3.4	10.1
Study Release Programs						
No	912	253.5	2.7	21.8	13.2	26.8
Yes	108	224.7	2.5	12.9	8	25.2
Missing	30	53.8	0	20.2	3.4	10.1

Source: BJS, Mortality in Correctional Institutions, 2019; Census of Adult State and Federal Correctional Facilities, 2019.

Security Issues

Security issues, measured by several indicators related to the number of disciplinary reports filed,[9] assaults against staff, assaults against incarcerated individuals, and disturbances,[10] are generally associated with higher homicide and suicide mortality rates (Table 6). A greater number of physical assaults against staff and incarcerated individuals and more disturbances recorded within a facility are associated with a higher rate of intoxication deaths. The patterns are not consistent for natural and accidental deaths.

Table 6. *Mortality rate per 100,000 people in state prisons, by selected facility characteristics: 2019*

Security Incident	No. of Facilities	Natural	Accident	Intoxication	Homicide	Suicide
Disciplinary Reports Filed						
0 reports	22	127.6	0	56.7	0	0
1 or more reports	886	255.6	2.8	20.7	12.7	27
Missing	142	158.1	0.8	16.8	8.8	20
Physical or Sexual Assaults Against Staff						

[9] Disciplinary reports include those filed for major infractions, such as drug and alcohol violations, possession of stolen property, possession of contraband, and other major violations.

[10] Disturbances are incidents brought about by an incarcerated individual that result in the partial or complete loss of control of the facility.

Security Incident	No. of Facilities	Natural	Accident	Intoxication	Homicide	Suicide
0 assaults	499	187.8	2.1	15.7	7.5	16.1
1 or more assaults	412	302.2	3.4	26	17.9	36.3
Missing	139	180.4	0.7	12.8	3.4	14.9
Physical or Sexual Assaults Against Confined Individuals With Serious Injury						
0 assaults	281	286.4	3.3	12.5	6.5	23.4
1 or more assaults	586	247.5	3	24.7	15.2	28.7
Missing	183	192	0.5	11.3	5.6	18.4
Physical or Sexual Assaults Against Confined Individuals Without Serious Injury						
0 assaults	147	258.3	1.4	12.8	4.3	18.5
1 or more assaults	720	254.7	3.1	23.1	14.3	28.4
Missing	183	192	0.5	11.3	5.6	18.4
Total Physical or Sexual Assaults						
Q1: <20 total assaults	439	280.5	1.4	9.1	10.9	17.5
Q2: 20 to <40 total assaults	178	203.8	3.4	10.3	6.8	23.1
Q3: 40 to <80 total assaults	162	273.4	2.5	21.9	13.9	31.6
Q4: 80+ total assaults	146	241.6	3.9	42.5	18.4	35.4
Missing	125	184.7	0.9	12.8	7.7	19.6
Disturbances						
0 disturbances	854	264.4	2.5	19.9	11.4	26.5
1 or more disturbances	36	131.8	2.4	43.9	22	25.6
Missing	160	185	3.2	11.5	11.5	24.3

Source: BJS, Mortality in Correctional Institutions, 2019; Census of Adult State and Federal Correctional Facilities, 2019.

Multivariable Analysis for Census of State Correctional Facilities

Given the complicated associations between facility characteristics and programs and deaths in custody, RTI conducted a multivariable analysis to better assess and isolate the impact of these factors. Because this report uses count data (i.e., number of deaths per facility) and many agencies reported zero deaths for 2019, RTI used a negative binomial regression model[11] to explore associations between confinement facility characteristics and causes of death. The facility population was used as the model offset. No imputation was performed and, given

[11] RTI used negative binomial regression models to explore the associations of facility characteristics and natural deaths, suicides, drug or alcohol intoxication deaths, and homicides. RTI used a Poisson regression model to explore the association of facility characteristics and accident-related deaths, as this modeling approach was a more appropriate fit for the data.

missingness within the candidate characteristics, 767 facilities were ultimately included in the analysis.[12]

Table 7 shows that significant differences were found for some facility characteristics across most but not all causes of death. For intoxication deaths, many of the facility characteristics did not appear to have a statistically significant association. For other death types, including natural deaths and homicides, the lack of any educational programs was associated with an increased mortality rate. Facilities specializing in functions other than general confinement were associated with more natural deaths and fewer intoxication deaths than general confinement facilities. Female-only facilities were associated with lower rates of suicide, intoxication, and natural deaths than male-only facilities.

Table 7. *Associations of prison facility characteristics and programs on prison deaths: 2019*

	Natural Deaths		**Suicide**		**Intoxication**		**Homicide**		**Accident**	
Variable	**IRR**	**Sig.**	**IRR**	**Sig.**	**IRR**	**Sig.**	**IRR**	**Sig.**	**IRR**	**Sig.**
Intercept	0.06	***	0.00	***	0.00	***	0.00	***	0.00	**
Capacity (Ref: over)										
At capacity	2.31		2.46		0.00		0.00		0.00	
Under capacity	0.66	**	0.79		1.14		1.67		0.27	*
Capacity unknown	0.44	**	0.53		0.35		0.81		0.15	
Major Facility Function (Ref: general confinement)										
Non-general function	1.49	*	1.01		0.33	*	0.84		0.66	
Housing (Ref: male-only)										
Female-only	0.56	*	0.36	*	0.06	*	0.00		0.13	
Both males and females housed	3.64	***	1.10		0.78		1.96		2.78	
Physical security level (Ref: maximum +)										
Minimum/low	0.38	***	0.24	***	0.20	*	0.14	*	0.19	

[12] RTI formally assessed the impact of missingness on the final model by exploring changes to the model results as we progressively added blocks of conceptually similar covariates to the model while keeping the same size of population. This allowed us to see whether there were any major deviations or changes in parameter estimates or standard errors based on the covariates themselves instead of a changing sample. There were very few changes to estimates or standard errors that warranted much concern due to missingness. RTI also compared the facilities included in the analysis (n = 767) with those that were not included because of missing data (n = 282) on several key characteristics, including the primary function of the facility; facility size; physical security; and operator of the facility (e.g., state authority, local authority, private authority). Results from these comparisons revealed that facilities significantly differed on all of the tested characteristics, with the exception of the primary facility function.

	Natural Deaths		Suicide		Intoxication		Homicide		Accident	
Variable	**IRR**	**Sig.**	**IRR**	**Sig.**	**IRR**	**Sig.**	**IRR**	**Sig.**	**IRR**	**Sig.**
Medium	0.50	***	0.44	***	0.62		0.60		0.15	*
Other, none, unknown	0.49	*	0.43		2.66		1.72		0.39	
Demographics										
% Black	0.99	*	0.99		1.01		1.03	*	0.98	
% Hispanic	0.97	***	0.99		0.98		1.00		0.94	
% American Indian	0.98		0.98		0.98		1.01		0.95	
% Asian	0.75	***	0.92		1.00		0.87		1.15	
% Native Hawaiian	1.09	***	0.91		0.32		0.97		0.99	
Educational programs—none	3.16	***	1.04		0.81		3.54	**	1.43	
Special programs—none	0.56	*	0.91		0.81		2.19		2.55	
Inmate work—none	2.71		0.00		0.00		0.48		0.00	
Geriatric unit	0.17	***	0.95		0.89		0.75		7.46	
Veterans housing	1.61	*	1.59		1.47		0.62		0.41	
Total security staff	1.00	***	1.00	**	1.00		1.00	**	1.00	
% female security staff	1.00		1.00		1.02	*	1.00		1.05	**
% restrictive housing	1.00		1.01		1.03	**	1.02	**	0.97	
Total physical and sexual assaults	1.00		1.00	*	1.00		1.00		1.00	
Disciplinary reports	1.00	**	1.00		1.00		1.00		1.00	
Disturbances	1.01		0.96		0.95		0.99		0.90	

Note: *** p < 0.001 ** p < 0.01 * p < 0.05. IRR = incident rate ratio; Sig. = significance. Models examining deaths by natural causes, suicide, homicide, and drug or alcohol intoxication used negative binomial specification; models examining deaths due to accident used a Poisson specification.
Source: BJS, Mortality in Correctional Institutions, 2019; Census of Adult State and Federal Correctional Facilities, 2019.

Longitudinal Analysis

To assess the effect of time and facility characteristics on prison mortality rates, RTI used the last three periods of the Census of State and Federal Adult Correctional Facilities linked to decedent data. These included the years 2005, 2012, and 2019. Because a shortened survey was administered in 2012, the number of items that could be included in a longitudinal analysis was limited. Common items across all three timepoints included facility security level, operation authority, and housing gender. Therefore, the analysis population was limited to nonfederal

confinement facilities.[13] RTI used a negative binomial regression model to examine the relationship between the number of deaths, by each manner of death, and prison characteristics. End-of-year (December 31) prison populations, as reported within each survey, were used as the offset. The offset provides a measure of size to contextualize and determine the incident rate of death.

Table 8 shows that, across all causes of death, significant associations were found for each variable. Across all causes of death, consistent differences were found between male-only and female-only facilities, with the latter generally having lower mortality rates. For all deaths, mixed-gender facilities had an incident rate 10.3 times higher than male-only facilities.[14] As it relates to facility security, those under maximum security and higher had higher mortality rates than those in minimum- or low-security facilities. Except for homicide and intoxication, facilities operated by private contractors had a significantly lower mortality rate than state-operated prisons. With respect to time, 2019 yielded higher incident mortality rates across all causes of death than 2005, with drug and alcohol intoxication having the largest difference.

Table 8. *Prison facility characteristics associated with in-custody incarcerated individual deaths: 2005, 2012, 2019*

	Total		**Natural**		**Suicide**		**Intoxication**		**Homicide**	
Variable	**IRR**	**Sig.**	**IRR**	**Sig.**	**IRR**	**Sig.**	**IRR**	**Sig.**	**IRR**	**Sig.**
Intercept	0.00	***	0.00	***	0.00	***	0.00	***	0.00	***
Who operates (Ref: state authority)										
Local authority or joint state and local authority	0.29	***	0.26	***	0.87		1.05		0.54	
Private contractor	0.41	***	0.37	***	0.52	*	0.91		1.41	
Housing (Ref: male-only)										
Female-only	0.76	*	0.81		0.56	*	0.27	**	0.12	**
Both males and females	10.27	***	11.31	***	1.75	**	0.97		0.99	
Physical security level (Ref: maximum +)										
Minimum/low	0.45	***	0.51	***	0.14	***	0.16	***	0.15	***
Medium	0.65	***	0.70	***	0.44	***	0.48	***	0.36	***
Other, none, unknown	0.74		0.80		0.50	*	0.99		0.19	**
Year 2012	0.85	*	0.85		0.80		0.69		1.07	
Year 2019	1.39	***	1.27	**	1.67	***	6.67	***	2.87	***

Note: *** $p < 0.001$ ** $p < 0.01$ * $p < 0.05$. IRR = incident rate ratio; Sig. = significance.
Source: BJS, Mortality in Correctional Institutions, 2019; Census of Adult State and Federal Correctional Facilities, 2019.

[13] Confinement facilities are prisons where at least 50% of the incarcerated population is confined to the facility at all times.

[14] Of the 74 facilities authorized to house both males and females in 2019, most were state-operated (n=66), followed by privately operated (n=6) and jointly operated by the state and local jurisdiction (n=2)

Summary of the Facility Characteristics Associated with Deaths in State Prisons

- In 2019, 54% of all prison facilities reported one or more deaths.
- Most prisons did not report a single suicide, intoxication, homicide, or accidental death in any year.
    - In 2019, 82% of prisons had zero suicides, 87% had zero intoxication deaths, 91% had zero homicides, and 97% had zero fatal accidents.
- Several facility characteristics were associated with higher mortality rates, and these differed by manner of death.
    - Facility functions were associated with mortality rates. For example, prison facilities equipped to address age-related diseases, such as cancer and heart disease, had higher rates for these types of death. Similarly, intoxication deaths appeared more pronounced in facilities that provided alcohol or drug treatment, whereas higher suicide rates were found in facilities with mental health and medical treatment. These associations suggest that facilities develop or adopt programs aligned with the needs of their populations or individuals with certain needs are assigned to facilities with certain services.
    - Few consistent patterns emerge between mortality rates and educational and work programs offered to incarcerated persons. For example, alcohol and drug dependency awareness programs were associated with higher rates of intoxication deaths. Additionally, the lack of education programs was associated with higher homicide and natural deaths. Like facility functions, these programs may be aligned and allocated to the populations most in need.
    - Security issues—as measured by several indicators related to disciplinary reports, assaults against staff, assaults against inmates, and disturbances—are generally associated with higher rates of homicide and suicide mortality.
- Interpretation of these associations is complicated because they may be confounded by other factors. For example, differences in mortality rates by prison facilities that are operated by the state and those that are run by a private organization could be driven by factors such as differences in the criminal history of the prison population served or differences in staffing ratios. Although the differences between state and private operators are real and point to possible risk factors, other explanatory factors need to be considered.

Review of the Literature on Policies and Practices Designed to Reduce Mortality in Prisons

The descriptive, cross-sectional, and longitudinal analyses described previously, which rely on BJS Mortality in State and Federal Prisons and the Census of State and Federal Adult Correctional Facilities (2005, 2012, 2019), provide a general overview of the types of deaths that occur in prison facilities in the United States and the individual and institutional contexts surrounding such deaths. Although there are a significant number of deaths in prisons each

year, the rarity of death within most individual facilities—particularly for suicide, intoxication-related deaths, and homicide—makes analyses to isolate key programs, practices, and policies associated with fewer deaths difficult. Furthermore, differences in characteristics across facilities limit these analyses such that noted associations do not necessarily indicate causality.

This section describes literature on the policies and practices designed to reduce deaths in prison facilities. Because of the relative rarity of deaths in prisons, limited data and research, and the differing contexts of prison environments, most studies focus on specific manners of death or focused policies and practices; it is impossible to provide recommendations that are applicable to all facilities. Instead, the literature summarized below provides an overview of the policies and practices that have been studied, implemented, or recommended through research or by subject matter experts to prevent deaths that occur in prison facilities. Literature focused on mortality after release from prison or any policies and procedures that would be implemented outside of the prison environment is beyond the scope of this review.

Although many policies and procedures are designed to mediate risk for specific manners of death that occur in prison environments, others support the overall health and safety of individuals who are incarcerated. These more general policies may therefore reduce overall risk for mortality. For example, screening individuals upon admission to a prison facility can identify risks for mortality, such as substance abuse disorder, mental health challenges, infectious diseases, or chronic medical conditions as well as strategies to guide the housing, classification, and management of each individual. Many incarcerated individuals enter facilities in poor health and disproportionately suffer from mental, substance abuse, or medical disorders. Women who are incarcerated are likely to be particularly unhealthy and medically underserved (Cloud et al., 2014). Screening has the potential to mitigate mortality risks for accidental or intentional overdoses, suicide, homicides, and natural deaths caused by infectious diseases or chronic conditions.

General screening can also inform individual classification and management policies and practices, which are particularly critical given the high rate of incarceration in the United States, which has led to periodic overcrowding in prison facilities. Rapid expansion of the prison population and overcrowding can adversely affect general living conditions; safety of incarcerated individuals and correctional staff; and access to educational, occupational, therapeutic, or other programming (Haney, 2003; Wilper et al., 2009). There were 93 sentenced individuals per 100,000 U.S. residents in 1972. By 2021, this number had risen to 350 per 100,000. At the end of 2021, more than 1.2 million people were incarcerated in state or federal prison facilities. Incarceration rates in 2021 represent a 1% decrease since 2020—largely due to releases associated with the COVID-19 pandemic—and a 25% decline from the high of approximately 1.6 million people who were incarcerated in state and federal prisons in the United States each year during the period from 2007 through 2011 (Carson, 2022).

Identifying and Treating Physical Health Conditions

Illness accounted for 80% of the deaths that occurred in U.S. prisons from 2001 through 2019 (Carson, 2021). Forty percent of all incarcerated individuals in the United States reported currently having a chronic disease (Maruschak et al., 2016). Many such diseases are diagnosed for the first time in a screening conducted at intake (Wilper et al., 2009). Incarcerated individuals who are age 55 or older are the fastest growing age group of the U.S. prison population and are expected to make up one-third of all incarcerated individuals by 2030. As the prison population continues to grow older, the risks for mortality related to illness and disease also increase (Porter et al., 2016; Skarupski et al., 2018). Older incarcerated individuals are more likely than their younger counterparts to suffer from diabetes, cardiovascular conditions, liver disease, increased anxiety, and depression (Munday et al., 2019; Skarupski et al., 2018).

Managing Chronic Health Conditions

Studies show that most incarcerated individuals are receiving medical care for chronic conditions and are generally satisfied with that care. An analysis of BJS' Survey of Inmates in State and Federal Correctional Facilities found that among incarcerated individuals with persistent medical problems, most had received a medical examination since incarceration (86% of federal and 80% of state), and more than 70% continued prescription medication after prison admission (Wilper et al., 2009). BJS found that more than half of individuals who were incarcerated (56%) were very or somewhat satisfied with the health services they had received since entering prison, and about 66% of prisoners with chronic conditions reported taking prescription medication while incarcerated (Maruschak et al., 2016). However, 44% were not at all satisfied with the health care services they received.

Policies that address care for degenerative or chronic health conditions may also reduce mortality risk. Manz et al. (2023) found in their review that cancer screening rates among incarcerated individuals is low. High blood pressure and diabetes are among the most common chronic conditions reported among individuals incarcerated in prisons (Maruschak et al., 2016; Wilper et al., 2009), and cardiovascular disease is the most common cause of death among incarcerated individuals (Noonan & Ginder, 2013). Thomas and colleagues (2016) conducted a study to explore how prisons could best address cardiovascular disease risk factors in prisons and found that access to treatment was limited because treatment occurred most often for acute conditions, as opposed to management of chronic cardiovascular conditions, such as high blood pressure. Furthermore, the multiple roles and responsibilities of clinical and custodial staff also were a barrier to accessing care for cardiovascular disease. The study recommended that prisons implement policies to schedule free medical care for individuals with cardiovascular disease and provide for procedures that allow these confined individuals to fulfill the recommendations of medical care providers to mediate the risks associated with cardiovascular disease.

Limiting Transmission of Infectious Disease

Because of the nature of confinement and the proximity of incarcerated individuals to each other, prison environments may be particularly conducive to the transmission of infectious diseases. For example, the rates of COVID-19 were higher in prison settings than in the general population, as were the rates of death caused by COVID-19 (Marquez et al., 2021, 2022; Saloner et al., 2020). COVID-19 cases in federal prisons were five times as high as in the general population, and the rate of mortality was 2.5 times higher (Toblin & Hagan, 2021).[15] Other infectious diseases have a higher prevalence in prisons as well. The prevalence of hepatitis C in the U.S. population is only 2%, whereas it can be as high as 70% in incarcerated settings (Wurcel et al., 2021). Hepatitis C is associated with a 61% increase in mortality after a hospitalization for the disease.

Prison-based screening can be highly effective for reducing the transmission and progression of infectious diseases such as COVID-19, HIV, tuberculosis, and hepatitis C, thereby reducing risk of disease for both incarcerated individuals and prison staff. At the first sign of infectious disease, rapid testing must be used, and daily testing needs to be done once an outbreak is determined. Individuals with confirmed cases of the disease should be put into medical isolation, not solitary confinement. Correctional facilities must also be ready to adjust interpersonal activities to reduce the risk of transmission, such as replacing in-person visits with tele-visits. Decarceration is another tactic that may be considered to prevent disease spread and the related risk of mortality. For example, some facilities considered and implemented early release policies during the COVID-19 pandemic, prioritizing release consideration for those who were elderly, already nearing release, and convicted of nonviolent crimes (Novisky et al., 2021).

Promoting Overall Physical Health

Qualitative studies of pilot nutrition programs in prisons have found that they result in improved nutrition practices for incarcerated individuals who participated in pilot programs relative to controls, suggesting that participants may benefit from nutrition workshops (Curd et al., 2013). Studies of the nutritional value of food available in prison environments found that the food was generally high in sodium, saturated fat, added sugars, refined grains, and calories and that commissary items and recipes were low in fruits, vegetables, and whole grains (Collins & Thompson, 2012; Rosenboom, et al., 2018) or did not meet recommended food and nutrient target levels (Collins & Thompson, 2012). Additionally, one study has shown that individuals incarcerated in some prisons are exposed to per- and polyfluoroalkyl substances (PFAS) in the drinking water, which can contribute to poor health outcomes for individuals who are incarcerated in these facilities (Poirier et al., 2024). Understanding and preventing these types of exposures can further promote overall physical health among this population.

[15] Findings from all studies referenced in this paragraph are based on comparisons that adjusted the calculated infection and mortality rates for age and sex, used age- and gender-standardized infection and mortality rates, or both.

Identifying and Treating Mental Health Conditions

Suicide is the second leading cause of death among individuals incarcerated in state facilities, accounting for approximately 8% of all prison deaths. Understanding the environmental circumstances and individual risk factors that correlate with death by suicide may suggest policies to reduce the risk of suicide.

Mental and cognitive health disorders are relatively prevalent among incarcerated individuals. An estimated 20% of the incarcerated population is diagnosed with or showing symptoms of a significant psychological disorder or developmental disability (Sinha, 2010), including 4% who are developmentally disabled, 7% who have diagnosed psychotic disorders, and 12% who experience symptoms of other psychological disorders (Haney, 2001).

Stoliker (2018) found that the following individual-level factors increased the odds that a person attempted death by suicide while incarcerated: having engaged in high drug and alcohol use before prison, suffered from serious mental illness, been irritable, had difficulty feeling close to family and friends, had feelings of hopelessness and dissociation, experienced auditory hallucinations, and had poor physical health. Incarcerated individuals who commit suicide may be more likely to have had a history of substance use disorder or a diagnosis of schizophrenia (Dixon et al., 2020; Folk et al., 2018). Folk and colleagues further found that confined individuals who died by suicide were more likely to have had a recent decline in physical health. Compared with individuals who attempted suicide while incarcerated, individuals in prison who died by suicide were less likely to be receiving mental health treatment and more likely to be noncompliant with prescribed psychotropic medication. BJS found that among individuals who are incarcerated in state and federal prisons and have a history of mental illness, 63% do not receive mental health treatment (Bronson & Berzofsky, 2017). Furthermore, of individuals who were taking medication for mental health conditions upon admission to prison, half did not continue to receive that medication while incarcerated (Reingle Gonzalez & Connell, 2014).

Several studies have explored gender differences in the factors that precipitate attempted suicide or suicide deaths of incarcerated individuals. Mennicke and colleagues (2021) analyzed data from the National Violent Death Reporting System for suicide deaths among incarcerated females and found that about 20% of these individuals had used alcohol shortly before their death and 12% tested positive for opiates. Furthermore, incarcerated women who died by suicide were more likely than their male counterparts to have had mental health and substance use problems while incarcerated, have experienced violence in the month before their death, and have had a history of abuse and neglect. Dye and Aday (2013) examined suicide ideation among women serving life sentences and found that incarcerated women with higher depression scores and lower prison adjustment scores had significantly greater odds of current suicide ideation. Using data from the BJS 2004 Survey of Inmates in State and Federal Correctional Facilities, Stoliker et al. (2021) examined gender differences in suicide ideation among incarcerated individuals, and found that a depressive disorder diagnosis, sexual abuse

before incarceration, diagnosis of a bipolar or related disorder, alcohol dependence, and the number of physical illnesses were associated with suicide ideation, particularly among men.

However, research indicates that assessing suicide risk in correctional mental health settings should not rely only on a patient's self-report of suicidal ideation. One study found that among confined individuals receiving mental health treatment, about a third reported they were unwilling to tell staff if they were having suicidal thoughts (Way et al., 2013). Most individuals who committed suicide while incarcerated were not receiving mental health treatment at the time of their suicides (Way et al., 2005), suggesting that more efforts should be focused on screening individuals for suicide risk factors at prison intake and at points that may be stressful, such as transfer to a disciplinary housing unit. Suicides may be more likely to occur among individuals who are housed in single-person or segregation cells (Boren et al., 2018; Dixon et al., 2020). Folk et al. (2018) identified factors related to the prison environment that increased the risk for an attempted death by suicide, including experiencing victimization while imprisoned and being put in segregation for disciplinary action. Other environmental factors reduced the risk of attempted death by suicide, including receiving visits and engaging in physical exercise. Extreme heat, such as that experienced during heat waves, has also been linked to suicide ideation and attempts among incarcerated individuals (Cloud et al., 2023; Skarha et al., 2023).

Prison administrators may also consider several architectural and environmental safeguards to mitigate suicide risk. For example, "anti-suicide" products such as safety smocks and blankets, "suicide-resistant" cells with tamper-proof light fixtures, fiberglass-molded bunks with rounded edges and no tie-off points, frequent checks on confined individuals (i.e., regular intermittent observation), and closed-circuit television monitoring of cells are all measures to protect incarcerated individuals against suicide. Additionally, making efforts to diversify correctional staff may be beneficial, as one study found that having a mixed-gender correctional officer workforce reduced the occurrence of suicide in prisons (Carter & Whittle, 2023).

In 2019, a Consensus Workgroup of 12 organizations developed recommendations for the executive and legislative branch to consider to comprehensively address the issues at the intersection of behavioral health and criminal justice (Consensus Workgroup, n.d.). Those recommendations included providing correctional officers with training on de-escalation and other strategies to promote safety in response to an incarcerated individual who is in a mental health crisis. The National Institute of Corrections has developed training for Crisis Intervention Teams (CITs) in prisons to support collaborative responses between correctional staff, mental health service providers, and advocates to implement strategies to reduce crisis situations, improve safety, and promote better outcomes for individuals with mental illness. Canada and colleagues (2021) implemented a quasi-experimental, mixed-methods study of correctional officers and found that CIT officers who engaged in the training had significantly lower stigmatizing attitudes, more mental health knowledge, and better perceptions of options after CIT training than other correctional officers. Additional research is needed, however, on

whether these attitudes and knowledge lead to behavioral change among officers trained in CIT.

The Consensus Workgroup recommends that prison systems facilitate and support universal adoption of evidence-based screening, assessment, and treatment in jails and prisons, including access to both psychosocial and psychopharmacological treatments, as indicated. The Correctional Mental Health Screen (CMHS) is commonly cited in the literature that examines mental health screening for individuals in jails and prisons. Goldberg and Higgins (2006) found that the CMHS was effective in identifying individuals in need of mental health treatment. Martin and colleagues (2013) reviewed validation and replication studies of 33 screening tools for mental health needs of incarcerated individuals and also concluded that the CMHS instruments (which have separate versions for women and men) are promising but that additional research is needed to explore various contextual factors associated with the tool's implementation. Specific to self-directed violence risk, Cramer et al. (2022) developed the Self-Injury Risk Assessment Protocol for Corrections (SIRAP-C), which has shown promising results in identifying individuals at risk of self-injury and should be further studied.

Some prisons are also leveraging other incarcerated individuals in their approach to suicide prevention. Peer support or peer safety companions are inmates who are typically trained to provide support to their fellow inmates through mentoring, companionship, or observation during mental health crises. In a review of the prevalence of such programs, Tartaro and Klenk (2023) found that 15 states and the BOP include some component of peer support within their suicide prevention policies. More research is needed to understand the impact of these various programs on suicide.

Lyndsay Hayes, a nationally recognized expert in the field of suicide prevention in correctional settings who has been a consultant to the U.S. Department of Justice Civil Rights Division, recommends that prisons implement comprehensive suicide prevention policies, which include components to support the following:

- Training for all relevant staff to assess for suicide risk;
- Procedures that facilitate communication between outside medical and treatment facilities and the prison;
- Classification, monitoring, and access to visitors and programs that are commensurate with overall individual and facility safety, yet support reduced risk of suicides; and
- Appropriate communication, documentation, and mortality review for all suicides.

Hayes (2013) surveyed prison policies designed to reduce suicides and found that only 85% of respondents had a written suicide prevention policy, and 20% reported comprehensive policies that encompassed all of these components of a suicide prevention program. Similarly, Tartaro and Alas (2024) analyzed state correctional and BOP suicide prevention and response policies and compared those to best practices in the field. They found that correctional facility policies only include about half of the recommended suicide prevention elements.

Identifying and Treating Substance Use Disorder

In 2019, drug or alcohol intoxication was the third leading cause of death among state prisoners, after deaths by illness and suicide. Drug and alcohol intoxication accounted for only 2.3% of all state prison deaths from 2001 through 2018, but deaths by drug or alcohol intoxication increased 623% in state prisons over that same period, and in 2019, intoxication accounted for 6.6% of deaths (Carson, 2021).

Screening for substance use is also critical to identifying and addressing risks for mortality in prison; substance use is closely linked to risk of suicide. For example, one study of drug overdoses found that 80% of 130 individuals who were under the supervision of the Ohio Department of Rehabilitation and Correction and who presented to The Ohio State University Wexner Medical Center with drug overdose 2011 and 2014 had intentionally overdosed and that the drugs most commonly used in overdoses were anticonvulsants, cardiovascular drugs, and antidepressants (Fuh et al., 2016).

Studies have found that receiving opioid pharmacotherapies while incarcerated significantly reduces mortality (Degenhardt et al., 2014; Larney et al., 2014), and methadone treatment has been shown to reduce drug use during incarceration (Dolan et al., 2003). Macmadu et al. (2020) used simulations to predict the impact of medication for opioid use disorder (MOUD) in U.S. prisons and jails. They determined that 1,840 lives would have been saved nationally if all individuals with clinically indicated need had received MOUD.

Although medication-assisted treatment is a well-researched and evidence-backed way to treat OUD, one study found that only 3.6% of incarcerated individuals with OUD received buprenorphine, a medication used in such treatment (Thakrar et al., 2021). Scott et al. (2021) surveyed representatives from 21 prison systems representing 583 prison facilities in states most severely affected by the opioid crisis and found that of the 21 prison systems surveyed, 61% did not provide any form of MOUD. Although most did provide MOUD to pregnant women, less than one-third provided it to anyone with OUD. Respondents further identified common barriers to accessing MOUD treatment, which included structural barriers such as states lacking funds to pay medical and clinical staff to provide the medication or to pay for the medication itself, or regulations that made it difficult to provide medication. Bandara et al. (2021) also identified structural barriers to medication-assisted treatment program implementation, including prescribing limits and licensing requirements. Additionally, there was some stigma around the program among staff, although they found that this stigma seemed to wear off over time as staff became more exposed to the program.

Reducing Violence and Homicides

Although homicides account for a relatively small proportion of all deaths that occur in prisons, the rate of homicide in state and federal prison facilities is more than two times greater than in the U.S. population overall when adjustments are made for the age, sex, and race/ethnicity of the prison population (Carson, 2021).

Homicides in prisons largely result from violence and assaults. About 19% of incarcerated individuals report that they have been assaulted by other confined individuals, and 21% report an assault by a correctional officer (Wolff & Shi, 2009).

When compared with other confined individuals, homicide perpetrators were not significantly more likely to have been convicted of a violent crime, but they were nearly twice as likely to have been previously convicted of murder and were serving significantly longer sentences. Perpetrators were six times as likely as others to engage in all types of rule violations, including being 11 times as likely to engage in assault-related rule violations and 19 times more likely to be involved in serious rule violations (Reidy et al., 2020).

Assaults and homicides may be reduced by classification and management of incarcerated individuals. For example, the Alabama Department of Corrections' internal classification system assigns new and current individuals to cells and housing blocks by considering individual needs and risks for conflicts or interpersonal violence, rather than making assignments that are strictly based on bed availability.

Furthermore, an incident management system can support policies and practices for correctional staff to better prevent, track, and respond to violent incidents. Such a system can not only identify patterns in the places and times that assaults and homicides are mostly likely to occur in the prison and the characteristics of the individuals involved but also support review of violent incidents after they occur. Incident review can identify lapses in physical security protections (e.g., nonfunctioning locks, blind spots in video surveillance) and also inform policies that can promote safety during transport, transition, or other situations where security and incarcerated individuals' behavior may be less controlled. Pennsylvania has developed and implemented a system to track and analyze intelligence about potential violence in the prison, a classification system used to minimize the potential for violent interactions, and correctional officer training to de-escalate potentially violent interactions between confined individuals; the commonwealth also regularly releases statistics on violent incidents.

Deploying Contraband Detection Strategies

Preventing, intercepting, and confiscating contraband in the prison environment can reduce or eliminate harmful substances, such as drugs, and objects, such as weapons, that may increase mortality to suicide, overdoses, or homicides. Prisons may employ various contraband detection technologies that scan for contraband that is carried into the prison environment by a person or in a vehicle or is already present in the prison setting.

The increase in new, synthetic drugs has fueled the rise of such drugs smuggled into correctional facilities (Shafi et al., 2020). Drugs make their way into prison facilities through mail, visitors, and correctional staff (Federal BOP, 2003; Peterson et al., 2023; Russo et al., 2021). Contraband detection strategies that focus on drugs at the point of entry into the facility have the greatest potential to mitigate drug contraband (NIJ, 2023), but eradicating banned illicit substances from the prison environment requires a comprehensive approach that also

includes facility-based drug treatment programs. Various technologies may be more or less effective at detecting certain types of substances, so multiple detection approaches are needed, including both regular and random monitoring and searches by correctional officers. Interdicting substances smuggled through the mail can be accomplished by digitizing mail through an off-site mail vendor.

While there is limited published research regarding the means by which a homicide within a prison is carried out, contraband does include sharp objects and weapons, and one study found that half of homicide victims in a midwestern prison facility died from stabbing (Reidy et al., 2020). Contraband may be detected through technologies that target the introduction of weapons into facilities from the outside through handheld scanners, X-ray machines, or drive-through technologies (Dix et al., 2021). However, unlike drug and cell phone contraband, which are usually introduced to correctional facilities via an outside source, weapons tend to be manufactured internally, thus requiring different detection strategies. Physical searches of both individuals and prison environments are the most effective way to detect weapons but are necessarily time intensive and have been complicated during this time of limited staffing because of COVID-19 protocols.

Drones have emerged as a new and persistent approach to introducing contraband into prison facilities (Dix et al., 2022). Prisons may employ visual scans by correction staff and sensor-based detection approaches. As federal communications and radio frequency detection laws may be complex, prisons should consult the interagency advisory published by the Federal Aviation Administration, the Federal Communications Commission, the U.S. Department of Justice, and the U.S. Department of Homeland Security when developing drone management plans.[16]

Recommendations

States and federal prison systems have already implemented several policies and practices designed to keep correctional staff and incarcerated individuals safe in prison and to explicitly reduce mortality in prisons. Research is limited on the impact of a specific strategy or group of strategies to reduce the mortality risk of incarcerated individuals. However, the descriptive analyses of the number and characteristics of deaths that occur among those who are incarcerated, exploratory research on the impact of specific strategies, and recommendations from national advisory boards support several recommendations to further understand and prevent deaths that occur in prison settings.

Prison environments in the United States vary considerably across states and facilities, as well as within facilities themselves. Furthermore, the policies, practices, and resources associated with any prison environment will differ based on the security and custody level of the facility; its physical layout; and differences within the facility and over time related to staffing, the population of individuals incarcerated there, and the circumstances that may affect daily

[16] https://www.justice.gov/olp/file/1084061/dl?inline

interactions among corrections officers and incarcerated individuals (National Academies of Sciences, Engineering, and Medicine, 2014).

Recommendation 1. Implement and assess multiple contraband detection technologies and procedures.

No one contraband detection approach will mediate the risk for all types of contraband, including those that may increase mortality risk, such as illicit substances or weapons. Each correctional facility is unique, and differences among facilities require different technologies, policies, and practices to increase security and safety. Key considerations for the successful use of contraband detection solutions include looking at operational achievability, restrictive policies and legislative constraints, and health and safety protections (Dix et al., 2021). Although numerous forms of technology can assist with contraband detection, such technology will never replace the need for rigorous and random searches of incarcerated individuals' living, working, and recreational areas.

Recommendation 2. Implement and conduct risk assessment to improve the classification and service referral processes for incarcerated individuals, including reducing reliance on solitary confinement.

Risk assessments—both at intake and throughout an individual's period of confinement—are important to ensure that the individual is housed in the least restrictive setting possible and can also be monitored for any likely physical or mental health needs. Additionally, screening for behavioral, mental, and substance use disorders is critical for proper referrals to responsive program and support services. The National Commission on Correctional Health Care (NCCHC) recommends that prisons implement comprehensive violence risk assessments—including histories of child and domestic abuse, sexual abuse, and personal victimization—at prison admission and at other key points during the individual's period of incarceration. Individuals with violent histories should be referred to appropriate health care providers and treatment regimens.

The Consensus Workgroup recommends reforms to limit the use of restrictive housing and thereby the mortality risks that it may exacerbate for incarcerated individuals. Enhanced programming and access to mental health or substance use treatment may help to address behavioral disorders and thereby prevent the need for restrictive housing. For example, the Federal BOP is exploring strategies to remove mentally ill offenders from restrictive housing through expansion of the Secure Mental Health Step-Down Program and to place a mental health professional in each of the agency's secure housing units.

Recommendation 3. Implement mental health and suicide prevention strategies, with an emphasis on risk assessment.

Prisons should implement comprehensive suicide prevention strategies, including the use of risk assessment instruments validated in the correctional environment. The suicide mortality

rate increased 63% from 2013 to 2019, with males, White individuals, and older individuals most at risk. There is a need to assess the extent of implementation, identify barriers, and develop strategies to incentivize and support implementation. The Consensus Workgroup recommends that prison systems facilitate and support universal adoption of evidence-based screening, assessment, and treatment in jails and prisons, including access to both psychosocial and psychopharmacological treatments, as indicated.

Recommendation 4. Enhance correctional officer staffing, training, and protocols for responding to health care needs.

Several risks associated with mortality can be exacerbated by inadequate staffing levels or staffing assignments to specific housing or interactive sections of the facility, lack of training on how to identify and respond to physical and mental health care needs, and lack of overall training to support the health needs of incarcerated people. Specific recommendations put forth by the NCCHC entail officer training and protocols to increase security and prevent violence among confined individuals, including developing protocols and guidelines for violence prevention, intervention, and follow-up for correctional officers and health professionals treating incarcerated individuals. Officer training should also focus on de-escalation and crisis intervention techniques.

Recommendation 5. Support comprehensive health care access as recommended by national professional organizations.

Adequate and timely data should be collected and reported to identify the impact of this policy change. Guidelines for alcohol and drug detoxification have been established and promulgated by the American Psychiatric Association, the American Society of Addiction Medicine, and the National Consensus Development Panel. Additionally, standards for the management of detoxifying incarcerated individuals in jails and prisons have been created by the NCCHC and the Federal BOP. The American Correctional Association and National Governors Association (2021) also created a roadmap for state prison systems that serves as a policy development tool for government and state officials looking to improve their OUD treatments for people involved in the justice system.

Recommendation 6. Implement a comprehensive mortality review process.

A mortality review process can provide important contextual information to inform prison policies designed to reduce deaths. Such reviews should, at a minimum, explore the circumstances surrounding the death to elucidate structural, procedural, environmental, or individual characteristics that may have contributed to the death and use these findings to inform policy and practice.

Recommendation 7. Expand the use and role of oversight commissions to identify areas for improvement and to monitor progress toward objectives.

Oversight commissions should be implemented to develop, implement, and assess adherence to recommendations by individual state departments of correction and the Federal BOP. The prevailing correctional culture tends to encourage security and medical staff to focus only on their individual areas, which inhibits innovative approaches to reduce mortality. An oversight commission can look more broadly at the interconnected needs and challenges within the prison environment that can increase mortality. Strategies are also needed to promote greater cooperation and collaboration in processes such as death reviews. For example, the governor of Arizona created an independent oversight commission to assess risk related to incarcerated individuals' health through prison inspections, review of prison documents, interviews with staff and incarcerated individuals, and ongoing monitoring of policies and practices designed to reduce health risks (Arizona Office of the Governor, 2023). The commission is designed to promote transparency and accountability and is expected to produce a report of its findings later in 2023.

Recommendation 8. Collect better data and conduct rigorous studies of the predictors of mortality in prisons.

Comprehensive, national-level data on mortality in prisons are lacking. There is a need for reliable, real-time data to improve our understanding of deaths in prisons and to support changes to policy and practice that reduce mortality risk. One study found that only 16 states provide regular and current information on suicides that occur in state prisons; other states provide limited information on suicides, and 13 states provide no data at all (LeMasters et al., 2023). Some national-level sources do exist, such as the UCLA School of Law's Behind Bars Data Project, which compiles information from state websites and recurring data collections with incarcerated individuals conducted by the BJS. However, resources are needed to support more rigorous research and evaluation that draws from these and other data sources and examines the correlates of mortality and the impacts of policies and procedures.

Conclusion

Findings from the environmental scan and secondary analysis of existing datasets provide a relatively comprehensive broad overview of what is known about individuals who die while in custody of state prisons. The study sought to identify key factors linked to fewer deaths in custody to inform policies and practices to reduce such deaths. The assessment of the state of the evidence as to which policies and practices are associated with these deaths is complicated by the general lack of research and data available. Many promising practices or critical factors related to the various manners of death have not been investigated with rigor.

Another complication is that each manner of death is likely to require a different approach or set of solutions. Illness-related deaths are driven by lack of access to medical care, whereas

suicide deaths are likely linked to the absence of proper screening, supervision, and treatment. Within prison, certain populations are more at risk for certain types of death. For example, White individuals are more at risk for death than Black or Hispanic individuals. Most important, the aging of the prison population has resulted in the need for significant attention to illnesses and medical care. Therefore, the risk profile for any facility will be determined in part by the population that is being served.

A few facility-level factors examined here are shown to be critical for mortality risk among incarcerated individuals. For example, looking at a series of bivariate associations between facility characteristics and death rates revealed that more secure facilities and those that house only males tended to have higher mortality rates in 2019 relative to lower security facilities and those housing only females. Multivariable analyses isolating the unique association between facility characteristics and mortality also revealed that some characteristics, including security and capacity level and sex housed by the facility, were associated with higher mortality rates for some types of death. For natural deaths, those facilities that were under-capacity relative to over-capacity, had a geriatric unit, and lacked any specialized programs were associated with higher mortality rates. For intoxication-related deaths, facilities that were non–general confinement facilities, housed females only, and were low-security facilities were associated with lower mortality rates. More restrictive housing available in a facility was associated with higher rates of intoxication and homicide-related deaths. The relationship between program offering and mortality rates was not consistent across different types of death. While facilities lacking in educational programs were associated with higher rates of natural and homicide deaths, facilities lacking specialized programs were associated with fewer natural deaths but had no relationship with other death types. In general, more research is needed for all types of policy and practices we discussed to build the evidence on what works to reduce deaths while in the custody of our state prisons.

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