

Do Sheriff-Coroners Underreport Officer-Involved Homicides?

María J. Prados , Thomas Baker, Audrey N. Beck, D. Brian Burghart, Richard R. Johnson, David Klinger, Kyla Thomas, and Brian Karl Finch

ABSTRACT

Introduction: In the United States, each state sets its own standards for its death investigation system. These may require independent medical examiners and coroners or allow for the sheriff to assume the role of coroner. Motivated by the well-established fact that counts of officer-involved homicides in official data sets grossly undercount the number of these incidents, we examine the possibility that different death investigation systems may lead to different death classification outcomes. **Methods:** To examine the potential differences in officer-involved homicide underreporting by presence of sheriff-coroner and violent death type (gunshot, intentional use of force, pursuit, or other vehicle accident), we compare ratios of incidents from both the Federal Bureau of Investigation's Supplementary Homicide Reports and the restricted Multiple-Cause of Death files from the National Vital Statistics System to the Fatal Encounters data across coroner contexts in California between 2000 and 2018; we quantify differences descriptively and examine bivariate tests of means. **Results:** We find significantly greater underreporting of officer-involved deaths in sheriff-coroner counties in both official data sets for all incidents compared with non-sheriff-coroner counties, independently of the period considered. These underreporting differences in the National Vital Statistics System are robust to restricting to gunshot and intentional use of force deaths, the type of incident expected to be less prone to misclassification in that data set. **Conclusions:** Officer-involved death underreporting in sheriff-coroner counties necessitates further scrutiny. Disparities in officer-involved death reporting suggest political pressure may play a role in classifying deaths.

AUTHORS

María J. Prados, PhD, Center for Economic and Social Research, University of Southern California

Roles: Led the design, data analysis and writing.

Thomas Baker, MA, Department of Criminology and Criminal Justice, University of Missouri-St. Louis

Roles: Contacted institutions and assisted with data collection, interpretation, and writing.

Audrey N. Beck, PhD, Department of Sociology, San Diego State University

Roles: Cleaned the data and assisted with interpretation of results and writing.

D. Brian Burghart, MA, Center for Economic and Social Research, University of Southern California

Roles: Assisted with analyses and data interpretation.

Richard R. Johnson, PhD, Doland Consulting Group

Roles: Assisted with analysis design and institutional knowledge of the topic.

David Klinger, PhD, Department of Criminology and Criminal Justice, University of Missouri-St. Louis

Roles: Assisted with analysis design and writing.

Kyla Thomas, PhD, Center for Economic and Social Research, University of Southern California

Roles: Cleaned and gathered data.

Brian Karl Finch, PhD, Center for Economic and Social Research, University of Southern California

Roles: Conceived the study and assisted with interpretation of results and writing.

CORRESPONDENCE

María J. Prados, PhD, Center for Economic and Social Research, University of Southern California, 365 Downey Way, Los Angeles, CA 90089, USA; prados@usc.edu

ACKNOWLEDGMENTS

We would like to acknowledge the research support of Isis Venner.

AUTHOR CONTRIBUTIONS

This work builds upon previous work by the Officer-Involved-Homicide Consortium. The OIH Consortium is a working group that compiles and analyzes data about law enforcement officer-involved homicides of civilians. All consortium members are instrumental in data collection, data cleaning, variable creation, and analysis. This data group doubles as a collaborative writing group; each author makes significant contributions through direct writing and

editing, and data collection and curation. Therefore, we ask for an exemption to the coauthor count limit as this is consistent with our consortium's egalitarian collaborations and work history allowing for the type of analysis submitted here.

ETHICAL APPROVAL

N/A.

STATEMENT OF HUMAN AND ANIMAL RIGHTS

N/A.

STATEMENT OF INFORMED CONSENT

N/A.

DISCLOSURES & DECLARATION OF CONFLICTS OF INTEREST

The authors, reviewers, editors, and publication staff do not report any relevant conflicts of interest.

FINANCIAL DISCLOSURE

Research reported in this article was supported by NICHD of the National Institutes of Health under award number R01HD093382.

ORCID iD

María J. Prados  <https://orcid.org/0000-0002-4986-0015>

KEYWORDS

Forensic pathology, Officer-involved homicides, Legal intervention, Justifiable homicides, Sheriff-coroner, Death investigation systems

INFORMATION

ACADEMIC FORENSIC PATHOLOGY: THE PUBLICATION OF THE NATIONAL ASSOCIATION OF MEDICAL EXAMINERS FOUNDATION

©2022 The Author(s) • (ISSN: 1925-3621) • <https://doi.org/10.1177/19253621221142473>

Submitted for consideration on 7 Jul 2022. Accepted for publication on 18 Oct 2022.

INTRODUCTION

In the United States, each state sets its own standards for what kinds of deaths require investigation and its own professional and continuing education requirements for individuals carrying out these investigations. In California, the death investigation system is a county-based mixture of medical examiner and coroner offices. The Constitution of California establishes the sheriff as an elected official. The sheriff is responsible for keeping the peace (e.g., making arrests, responding to calls), assisting the courts (e.g., superior court bailiffs), and operating the county jail. The coroner is responsible for inquiring into and determining the circumstance, manner, and cause of all violent, sudden, or unusual deaths. All 58 counties in California have a sheriff's department and 51 of those counties provide for the sheriff to assume the duties of the coroner, although this number has fluctuated slightly over the years. Other counties—where the sheriff doesn't assume both roles—have independently elected coroners and others have appointed coroners or medical examiners who perform the duties of the coroner (1). In this article, we examine the possibility that different death investigation systems may lead to different death classification outcomes.

In 2017, forensic pathologists Dr. Susan Parson and Dr. Bennet Omalu resigned from the San Joaquin County sheriff-coroner's office alleging that sheriff-coroner Steve Moore repeatedly intervened with conclusions drawn from death investigations involving law enforcement officers (2). A subsequent audit of deaths in the county in 2016 discovered at least four officer-involved homicides (i.e., civilian deaths caused by police officers) in which pathologists' conclusions were affected or overruled by the sheriff-coroner, mainly by certifying the manner of death as accident while the autopsy reports indicated homicide (3). Supervisors in San Joaquin County stripped the sheriff's office of their coroner responsibilities and handed the duties back to an independent medical examiner (4). Examples such as these make clear that the figure of sheriff-coroner may accentuate the conflict of interest in the presence of officer-involved homicides.

However, there is no previous empirical evidence about the existence of this potential bias (5).

Analyzing the problematics of officer-involved homicides is challenging in part because of the difficulty in accurately quantifying these types of incidents. It has been well established that "official" counts of officer-involved homicides grossly undercount the number of such deaths, regardless of source. For example, an analysis of the data program Arrest-Related Deaths (ARD) carried out by the Bureau of Justice Statistics found that only 49% of officer-involved homicides were captured in its data (6). Further, "justifiable homicides" voluntarily reported in the Federal Bureau of Investigation's (FBI) Uniform Crime Reports-Supplementary Homicides Report (SHR) data system are often estimated to annually underreport 50% or more of officer-involved homicides (7-9). Finally, the National Vital Statistics System (NVSS) collected by the Centers for Disease Control uses a combination of sources to identify an *International Classification of Disease, Tenth Revision (ICD-10)* code that specifies "deaths by legal intervention." These incident counts are found to be even lower than both the ARD and SHR counts (7). More recent estimates, comparing these official sources with an online database of officer-involved homicides called Fatal Encounters (FE) finds that official sources—depending upon the circumstances of each homicide—typically undercount annual homicides by anywhere between 50% and 250% (10).

The reason for undercounts in the two extant data systems (SHR and NVSS) is partially related, but distinct. These two systems are managed by different public agencies, and each system may be subject to unique pressures to classify homicides in a particular way that may not be present in the other. First, a large proportion of the undercounts in SHR are due to both non-response (e.g., state and county law enforcement agencies often do not submit data to the FBI) and omission of relevant incidents (10-12). On the other hand, measurement error—the result of a convoluted process of certification and classification—is partially responsible for gross undercounts in the NVSS (12). Although undercounts are common, there is widespread

anecdotal and survey evidence that forensic pathologists in general have been pressured to influence their findings—with coroners more likely to experience pressure than medical examiners—and have been subject to negative consequences for failing to bend to this pressure (13). In areas with an appointed coroner, relative to a medical examiner or elected coroner, there are fewer matches between the NVSS and an extant open source for data on law enforcement-related deaths (“The Guardian’s ‘The Counted’”), suggestive of an undercount in the NVSS (14). Among matched cases, they find no difference in misclassification by type of medical examiner/coroner. However, no studies to date have empirically examined whether any undercounts are specifically the result of sheriff-coroner influence.

The purpose of this article is to examine the potential differences in officer-involved homicide underreporting by presence of sheriff-coroner and violent death type (gunshot, intentional use of force, pursuit, or other vehicle accident). In order to do this, we compare ratios of incidents from two official data sources to incidents from a database of officer-involved homicides across coroner contexts in California.

METHODS

Overview

We compare two official sources of data (SHR and NVSS) with a more comprehensive collection of officer-involved homicides (FE) to empirically test whether undercounts are exacerbated in California counties in which death record reporting is under the jurisdiction of a sheriff-coroner versus a medical examiner or coroner.

Sheriff-Coroners in California

To determine how death investigations have been managed in California during our observation period, we contacted medical examiner offices and sheriff-coroner offices in each of the state’s 58 counties via telephone or email. For each county, agency representatives provided the dates of changes from the medical

examiner to the sheriff-coroner model or vice versa since January 1, 2000. This information was compared to online descriptions of each office for consistency.

In 2000, the start of our analysis period, 46 counties in California allowed the sheriff to assume the coroner role. Between 2005 and 2015, this number gradually increased to 51 and remained stable for the rest of the years in the analysis period. In 2000, sheriff-coroners were more prevalent in smaller counties. This pattern became stronger during the analysis period and, by 2016, all 41 counties with smaller populations (<500000) had sheriff-coroners.

Data Sources

To empirically test our central question, we compare two official data systems (SHR and NVSS) with a data set of officer-involved homicides (FE).

The FE is arguably the most comprehensive data collection of officer-involved homicides in the United States. The FE collected data on 23578 officer-involved homicides from 2000 to 2017 with a methodology combining Freedom of Information Act requests, crowd source efforts, and internal validation checks (10,11). A validation study found FE captured 98.5% of preselected cases, more than other open-source data sets and the Centers for Disease Control and Prevention’s *National Violent Death Reporting System* (15). A pilot study and ongoing data integration suggest greater coverage than all extant data sets (11). The FE further distinguishes between types of officer-involved homicides (gunshots vs. asphyxiation, e.g.), which allows for a more refined comparison between different data sources.

The SHR is maintained by the FBI, and it provides detailed information about the victim, offender, and circumstances of the incident. We used the SHR data until 2016 from Inter-university Consortium for Political and Social Research (16). The SHR defines *justifiable homicides* as “the intentional killing of a person without evil design and under such circumstances of necessity or duty as to render the act proper.” Within this category, we consider the incidents classified as

Table 1: Descriptive Statistics of Officer-Involved Homicides Reported in the Three Data Sources: FE, SHR, and NVSS.^a

Data Source	Years	Proportion of county/years without incidents	Incidents per county and year		
			Mean	Std. Dev.	Max
FE	2000-2018	46%	3.57	8.33	77
SHR	2000-2016	62%	1.92	5.17	52
NVSS	2000-2018	67%	1.47	3.41	22

Abbreviations: FE, Fatal Encounters; NVSS, National Vital Statistics System; SHR, Supplementary Homicides Report.
^aData correspond to California's 58 counties for the analysis period.

Felon killed by police as officer-involved homicides. It is well known that these incidents are underreported because many agencies fail to report and because reporting agencies underreport the number of incidents (10). But it is unclear whether reporting of incidents to the SHR would be subject to pressures from sheriff-coroner's offices, as incidents are reported directly from law-enforcement agencies as part of a larger crime reporting project to the FBI's uniform crime reports system.

We also use the restricted Multiple-Cause of Death files from NVSS (available until 2018), which provide detailed death certificate information. These data include the county of death and the *ICD-10* cause(s) of death codes. We classify as officer-involved homicides all deaths due to *legal intervention*—codes Y35.0-Y35.4, Y35.6, Y35.7, and Y89.0, as in the study by Barber et al (8). It is highly likely that classifying incidents as deaths *due to legal intervention* may be subject to influence by law enforcement officers, as information provided or omitted to the forensic pathologist would be a primary determinant of *legal intervention* status on a death certificate.

Table 1 describes the data corresponding to officer-involved homicides in the 58 counties in California. There are large differences in number of incidents reported across the databases. The average number of incidents per county and year is almost twice as high in FE (3.57) than in SHR (1.92) and NVSS (1.47). The FE reports no incidents in 46% of all county-year observations, while SHR and NVSS

report zero incidents in 62% and 67% of the county-year observations, respectively.

Measuring Discrepancies in Reported Cases Across Data Sets

Because of the large dispersion in the number of incidents across counties (**Table 1**), we measure the discrepancies in number of cases in SHR (n_{SHR}) and NVSS (n_{NVSS}) with respect to FE ($total_{FE}$) as ratios measuring the proportion of FE cases reported by SHR and NVSS. For instances with incidents reported in FE, we define these ratios:

$$SHR_{FE} = n_{SHR}/total_{FE}$$

$$NVSS_{FE} = n_{NVSS}/total_{FE}$$

Where $total_{FE}$ includes deaths due to gunshots, intentional use of force (asphyxiation and strangulation deaths), pursuits (homicides resulting from active police pursuits), vehicular accidents (deaths resulting from automobile accidents while officers are on patrol but not in active pursuit), and nonvehicular accidents.

When considering the potential association between misreporting and the presence of a sheriff-coroner, it can be important to account for the types of incidents. It is possible that certain types of deaths are more likely to be misclassified in the death certificates—thus affecting the NVSS counts—if coroners are unaware that the incident involved a law enforcement officer. These could be deaths due to pursuits and vehicular and nonvehicular accidents. Therefore, we

Table 2: Descriptive Statistics of Officer-Involved Homicides at the County Level, By Sheriff-Coroner Status, Data Source, and Type of Incident (FE).^a

		Statistics per county and year, by sheriff-coroner status						
		No sheriff-coroner			Sheriff-coroner			
		(County-year, N = 176)			(County-year, N = 926)			
		Mean	Std. Dev.	Max	Mean	Std. Dev.	Max	
		(1)	(2)	(3)	(4)	(5)	(6)	
Incidents by data source								
FE	All incidents ^b	10.9	16.99	77	2.18	3.99	27	
	Incidents by type ^c	Gunshots	8.07	13.49	59	1.46	2.9	22
		Intentional use of force	0.75	1.36	7	0.16	0.48	4
		Nonvehicular accident	0.28	0.62	3	0.08	0.37	6
		Pursuit	1.56	2.6	13	0.41	1.07	9
		Vehicular accident	0.23	0.63	4	0.07	0.47	11
SHR	All incidents	6.24	10.63	52	1.07	2.34	18	
NVSS	All incidents	4.17	5.36	22	0.96	2.6	22	

Abbreviations: FE, Fatal Encounters; NVSS, National Vital Statistics System; SHR, Supplementary Homicides Report.
^aThis table contains statistics corresponding to the number of instances of officer-involved homicides reported in the following data sets and years for California’s 58 counties: FE (2000-2018), SHR (2000-2016), and NVSS (2000-2018). Each county-year observation is classified as “sheriff-coroner” if the sheriff was also the coroner figure in that county and year, and as “no sheriff-coroner” if there was a medical examiner or independent coroner in that county and year.
^bIncludes a small number of nonvehicular accidents not noted separately by type.
^cFE classifies officer-involved homicides as follows: Gunshot is self-explanatory; intentional use of force includes asphyxiation and strangulation deaths; pursuit deaths are those homicides resulting from an active police pursuit; and vehicular accidents are those resulting from automobile accidents while officers are on patrol but not in active pursuit.

allow for the possibility that deaths due to both gunshots and intentional use of force are more likely to be accurately reported as “legal intervention” if a law enforcement officer is involved. We define analogous ratios (SHR_{FE_restr} , $NVSS_{FE_restr}$) restricted to gunshots or intentional use of force incidents in FE ($total_{FE_restr}$):

$$SHR_{FE_restr} = n_{SHR} / total_{FE_restr}$$

$$NVSS_{FE_restr} = n_{NVSS} / total_{FE_restr}$$

We test the hypothesis that the means of the unrestricted and restricted ratios for each data set with respect to FE across all county-years with incidents are independent of sheriff-coroner status. We did two-tailed and one-tailed tests for the unrestricted ratios and the restricted ratios (excluding deaths involving vehicles and accidents) using Stata 16 (two-tailed results available upon request). We also

test if changes in trends or the presence of outlier counties affect the results.

RESULTS

Statistics by Sheriff-Coroner Status

Table 2 shows the average number of officer-involved homicides reported in counties with a sheriff-coroner and in non-sheriff-coroner counties by the three data sets and by type of incident (in FE). Counties with no sheriff-coroner have more incidents on average than counties with sheriff-coroner in all data sets. At the same time, the discrepancies in reported incidents across the databases are large, with the average number of incidents being higher in FE than in SHR and NVSS for both types of counties.

It is worth noting that LA County, which accounts for 37% of all officer-involved homicide cases in FE in



Figure 1: Average number of officer-involved homicides by sheriff-coroner status. The figures indicate the average number of officer-involved homicides per county per year in each of the three data sets: FE, NVSS, and SHR, for California's 58 counties. The left panel corresponds to the counties without sheriff-coroner and the right panel to the counties with sheriff-coroner in each year. FE indicates Fatal Encounters; NVSS, National Vital Statistics System; SHR, Supplementary Homicides Report.

California, does not have a sheriff-coroner and it is known to severely underreport officer-involved homicides (9).

Evolution over time

Figure 1 shows the county-level average number of officer-involved homicides by data set and sheriff-coroner status for each year in the analysis. In all cases, we see that FE reports a higher average number of incidents than NVSS and SHR. However, this difference seems to grow after 2005. In particular, there is a diverging trend for SHR and FE for sheriff-coroner counties after 2005. We explore if counties switching status around this time could explain this change in trend, and we test for differences in underreporting in all years and after the change in trend.

Counties that switched to sheriff-coroner

Three counties switched to a sheriff-coroner in 2005: San Bernardino, Santa Clara, and Marin. Three other counties switched to sheriff-coroner after that: Tehama (2007), Fresno (2014), and Humboldt (2015).

To examine whether the change in the trend observed around 2005 for sheriff-coroner counties (**Figure 1**)

may be due to outlier counties changing status around this time, we did an event study comparing the number of incidents reported in these counties in SHR and NVSS to FE for each year around the time of the switch. Both data sets are more likely to underreport the number of officer-involved homicides, when compared to FE, after the switch to sheriff-coroner for the earlier switching counties (San Bernardino and Santa Clara), but not so for the later counties ($SHR_{FE}[\text{San Bernardino}] = 0.94$ pre-switch vs. 0.54 post-switch, $SHR_{FE}[\text{Santa Clara}] = 0.85$ pre-switch vs. 0.27 post-switch, $NVSS_{FE}[\text{San Bernardino}] = 0.86$ pre-switch vs. 0.5 post-switch, $NVSS_{FE}[\text{Santa Clara}] = 0.45$ pre-switch vs. 0.33 post-switch). Therefore, we find no evidence that the change in underreporting trends after 2005 might be due to the newly switched counties being prone to underreporting officer-involved homicides prior to the switch. If anything, these counties seem to have become more likely to underreport after changing to a sheriff-coroner regime.

Tests of Means

The statistics for ratios SHR_{FE} , $SHR_{FE_restricted}$, $NVSS_{FE}$, and $NVSS_{FE_restricted}$ are shown

Table 3: Ratios of Officer-Involved Homicides in SHR and NVSS With Respect to FE, By Sheriff-Coroner Status.^a

Ratios			No Sheriff-coroner			Sheriff-coroner		
			(County-year, N = 176)			(County-year, N = 926)		
			Mean	Std. Dev.	Max	Mean	Std. Dev.	Max
			(1)	(2)	(3)	(4)	(5)	(6)
<i>SHR_FE</i>	All incidents	All years	0.52	0.38	2	0.44 ^c	0.44	2.25
		After 2005	0.51	0.39	2	0.38 ^b	0.39	2
<i>SHR_FE_restricted</i>	Gunshots + use of force	All years	0.7	0.41	2	0.65	0.48	3
		After 2005	0.64	0.41	2	0.55 ^d	0.44	2
<i>NVSS_FE</i>	All incidents	All years	0.45	0.36	1.5	0.38 ^c	0.42	2
		After 2005	0.47	0.36	1.5	0.38 ^c	0.42	1.67
<i>NVSS_FE_restricted</i>	Gunshots + use of force	All years	0.6	0.43	2	0.53 ^c	0.48	2
		After 2005	0.59	0.42	1.6	0.51 ^c	0.48	2

Abbreviations: FE, Fatal Encounters; NVSS, National Vital Statistics System; SHR, Supplementary Homicides Report.

^aStatistics corresponding to the ratios of instances of officer-involved homicides reported in SHR with respect to FE (years: 2000-2016) and in NVSS with respect to FE (years: 2000-2018). California's 58 counties: Each county-year observation is classified as "sheriff-coroner" if the sheriff was also the coroner figure in that county and year, and as "no sheriff-coroner" if there was a medical examiner or independent coroner in that county and year. Column (4) includes the results from bivariate one-tailed test of underreporting, for the alternative hypothesis that the mean in non-sheriff-coroner counties is larger than in sheriff-coroner counties. Ha: (1)-(4) > 0 at significance levels.

^b $p < 0.01$.

^c $p < 0.05$.

^d $p < 0.10$.

in **Table 3**. The regular ratios and restricted ratios are smaller than one on average for both types of counties.

Table 3, column 4 presents the mean ratios for sheriff-coroner counties and it indicates the results from the tests evaluating whether the mean ratio is smaller in the sheriff-coroner subsample than in non-sheriff-coroner counties. The results for the unrestricted ratios indicate more underreporting in SHR and NVSS (lower proportion of cases compared to FE) in counties with a sheriff-coroner than no sheriff-coroner for all years (5% confidence).

As discussed in *Evolution over time* section, although $SHR_FE < 1$ for all years and county systems, the difference between FE and SHR widens for sheriff-coroner counties after 2005, when more counties switched to sheriff-coroner. A test of means for the unrestricted ratios indicates that the difference in underreporting in counties with a sheriff-coroner with respect to no sheriff-coroner in SHR is significant at

5% confidence for all years and 1% after 2005. In examining the potential role of outliers, we find no evidence that the forensic investigation regime switch of a large county (San Bernardino) is responsible for temporal changes in the extent of the discrepancy over time (not reported).

The test of means for the restricted ratios for NVSS (comparing NVSS counts only to deaths due to gunshots and intentional use of force in FE) also indicates there is significantly more underreporting with respect to FE in counties with a sheriff-coroner than in counties where the medical examiner or coroner is independent from the sheriff, regardless of the period considered (5% confidence). This result rules out the hypothesis that NVSS underreporting could be only explained by deaths that are more likely to be misclassified in death certificates. Although their work was not specific to sheriff-coroners, this echoes Feldman and colleagues' finding of fewer matched cases between the NVSS and a different open-source

database of officer-involved homicides in areas with an appointed coroner (14).

DISCUSSION

Despite reporting indicating that political pressure may play a role in medical examiners' official determination of officer-involved homicides, to date there is no evidence on whether counties with a sheriff-coroner may be more prone to undercounts or misclassification of such deaths (10). Although all medical examiners and coroners may face political pressure from the public and special interest groups, sheriff-coroners may feel particular pressure from law enforcement in ways that would downwardly bias counts of officer-involved homicides. Descriptively, we find a greater discrepancy between FE and both SHR and NVSS in sheriff-coroner counties than non-sheriff-coroner counties. Although other work has found a consistent discrepancy and undercount in official sources relative to more comprehensive ones, this is the first work, to our knowledge, that demonstrates this discrepancy is more pronounced in sheriff-coroner counties (4,6,7).

CONCLUSIONS

The results from this study are suggestive of differences in reporting accuracy by sheriff-coroner status. These results highlight the need to further scrutinize reporting and statistical tracking of officer-involved homicides. A limitation of this study is that due to the small number of counties that changed their death investigation system during the analysis period, it is not feasible to perform other types of analysis that would rule out alternative selective pressures that might drive these relationships when counties decide to switch regimes.

Officer-involved homicides greatly impact the health and well-being of communities, particularly communities of color. Death investigation systems that potentially affect accountability and obscure facts surrounding officer-involved homicides will make it

harder to measure the problem and design well-informed policies, exacerbating health inequalities.

REFERENCES

- 1) California State Association of Counties. *Sheriff-Coroner*. <https://www.counties.org/county-office/sheriff-coroner> [accessed November 4, 2022].
- 2) Hawkins D. Pathologist of 'Concussion' fame accuses Calif. sheriff of mutilating corpses, meddling with investigations. *Washington Post* [Internet]. <https://www.washingtonpost.com/news/morning-mix/wp/2017/12/07/pathologist-of-concussion-fame-accuses-calif-sheriff-of-mutilating-corpse-meddling-with-investigations/> [accessed November 4, 2022].
- 3) Small J. *San Joaquin County should Install Independent Medical Examiner, Audit Finds*. KQED [Internet]. <https://www.kqed.org/news/11663351/san-joaquin-county-should-install-independent-medical-examiner-audit-finds> [accessed November 4, 2022].
- 4) *San Joaquin Sheriff Stripped Of Coroner Role After Audit*. CBS News Sacramento [Internet]. <https://www.cbsnews.com/sacramento/news/san-joaquin-sheriff-coroner/> [accessed November 4, 2022].
- 5) O'Halloran RL. California: home of the sheriff-coroner. *Acad Forensic Pathol*. 2014;4(1):74-79.
- 6) Planty M, Burch AM, Banks D, et al. *Arrest-Related-Deaths-Program: Data Quality Profile*. Bureau of Justice Statistics NCJ 248544; 2015.
- 7) Loftin C, Wiersema B, McDowall D, Dobrin A. Underreporting of justifiable homicides committed by police officers in the United States, 1976-1988. *Am J Public Health*. 2003;93(7):1117-1121.
- 8) Barber C, Azrael D, Cohen A, et al. Homicides by police: comparing counts from the national violent death reporting system, vital statistics, and supplementary homicide reports. *Am J Public Health*. 2016; 106(5):922-927.
- 9) Currie M, Paris BS, Pasquetto I, Pierre J. The conundrum of police officer-involved homicides: counter-data in Los Angeles County. *Big Data Soc*. 2016;3(2):1-14.
- 10) Finch BK, Thomas K, Beck AN, et al. Assessing data completeness, quality, and representativeness of Justifiable homicides in the FBI's supplementary homicide reports: a research note. *J Quant Criminol*. 2021;38(1):1-27.
- 11) Finch BK, Beck A, Burghart DB, et al. Using crowd-sourced data to explore police-related-deaths in the United States (2000-2017): The Case of Fatal Encounters. *J Open Health Data*. 2019;6(1):1-8.
- 12) Loftin C, McDowall D, Xie M. Underreporting of Homicides by Police in the United States, 1976-2013. *Homicide Studies*. 2017; 21(2):159-174.
- 13) Melinek J, Thomas LC, Oliver WR, et al. National association of medical examiners position paper: medical examiner, coroner, and forensic pathologist independence. *Acad Forensic Pathol*. 2013;3(1): 93-98.
- 14) Feldman JM, Gruskin S, Coull BA, Krieger N. Quantifying underreporting of law-enforcement-related deaths in United States vital statistics and news-media-based data sources: a capture-recapture analysis. *PLoS Med*. 2017;14(10):e1002399.
- 15) Conner A, Azrael D, Lyons VH, et al. Validating the national violent death reporting system as a source of data on fatal shootings of civilians by law enforcement officers. *Am J Public Health*. 2019; 109(4):578-584.
- 16) Jacob K. *Uniform Crime Reporting (UCR) Program Data: Supplementary Homicide Reports, 1976-2016*. Inter-university Consortium for Political and Social Research [distributor]; 2018. 06-19. doi:10.3886/E100699V5