Validation and Case Fatality Rate Examination Using Police Agency-Reported Officer Involved Shooting Data

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Research Objective

- The majority of research on officer involved shootings (OIS) exclusively focuses on fatal shootings but many OIS do not result in fatality.
- This project will validate OIS data reported by eight police agencies and examine the case fatality rates for those agencies.

Background

- OIS surveillance exists in two primary forms: non-governmental databases and police agency reporting.
- Non-governmental databases are crowd-sourced (Fatal Encounters and Mapping Police Violence) or journalistic (Washington Post's Fatal Force Project).
  - Databases only track fatalities from police encounters and use public data, agency data, news reports, and social media [1,2].
  - Above databases have been previously validated to capture >97% of fatal officer involved shootings [1,3].
- Some U.S. police agencies report fatal and non-fatal OIS data.
  - These data have not been rigorously validated in count, either fatal or non-fatal, nor in victim, officer, or incident details.
  - Reporting is voluntary and no national governmental surveillance system exists to monitor the when, where, why, on whom, or the outcome of lethal use of force.

Methods

- Identified agencies with OIS data that met inclusion criteria of incident number, date, location, officer race, officer gender, victim race, victim gender, and outcome.
- Harmonized data into aggregate form from Charlotte-Mecklenburg Police Department (PD), Dallas PD, Denver PD, Jacksonville Sheriff's Office (JSO), Los Angeles County Sheriff's Department (LASD), Louisville PD, Orlando PD, and Seattle PD.
- Incidents prior to 2015 excluded as were 2021 to present. March-December 2020 retained with acknowledgement of possible impact of COVID-19 pandemic.
- Excluded friendly fire incidents and fatalities from self-inflicted wounds. Excluded incidents without location, subject, or outcome identified.
- Incidents with more than one victim within a single row were expanded to multiple rows with individual victim/outcome combinations.
- Data rows with only officer characteristics separated from rows reporting victim characteristics.
- Researched and added outcomes to several Los Angeles incidents where unspecified.
- Uniformly coded outcomes from agencies into Fatal or Non-Fatal and outcomes from all agencies except Louisville and Seattle into Deceased, Injured, and Not Injured.
- Converted locations with block or intersection to addresses. Latitude/longitude or address geocoded and correlated to census tracts, based on 2010 U.S. Census data.
- Validation conducted by comparing agency-reported fatal outcomes to data from crowd-sourced and journalistic databases.
  - Fatal Encounters and Mapping Police Violence filtered by agency and non gun-related and suicide data excluded.
  - Washington Post only includes shootings but does not specify agency. Non-agency records within city excluded by cross-referencing crowd-sourced databases.
- Aggregate and individual year case fatality rates (CFR) calculated for each agency using agency-reported data. Expressed as the proportion and percentage of victim outcomes that resulted in fatalities and is per victim, not per incident.

Results/Tables (Preliminary)

Table 1. Validation of Agency-Reported Fatal Outcome Data

	Charlotte	Dallas	Denver	Jacksonville	Los Angeles	Louisville	Orlando	Seattle
Years	2015-2019	2015-2019	2016-2019	2016-2020	2015-2020	2015-2019	2015-2019	2015-2018
Agency-Reported Fatalities	*16*	*19*	*18*	*30*	*75*	*18*	*10*	*9*
Mapping Police Violence Database	16	18	18	28	75	16	10	9
Fatal Encounters Database	16	19	20	28	78	16	10	9
Washington Post Fatal Force Project	16	15	18	27	73	17	10	9

- Validation showed the count of fatal incidents reported by Charlotte-Mecklenburg, Orlando, and Seattle matched number of all fatal incidents recorded within Mapping Police Violence, Fatal Encounters and Washington Post's Fatal Force Project databases.
- Other agency data also consistent with non-governmental sources, with largest discrepancy for Dallas, which reported 19 fatalities whereas the Fatal Force Project reported only 15 fatalities.

Table 2. Case Fatality Rate by Police Agency and Year

		2015	2016	2017	2018	2019	2020	Aggregate
Charlotte	Case Count	2/5	5/11	3/5	2/5	4/5	0/1	16/32
	Rate	*40%*	*45%*	*60%*	*40%*	*80%*	*0%*	*50%*
Dallas	Case Count	5/11	4/13	3/7	4/4	3/11	1/5	20/51
	Rate	*45%*	*31%*	*43%*	*100%*	*27%*	*20%*	*39%*
Denver	Case Count	4/10	6/13	1/6	5/8	6/10	n/a	22/47
	Rate	*40%*	*46%*	*17%*	*63%*	*60%*	*n/a*	*47%*
Jacksonville	Case Count	3/5	3/12	8/10	4/6	6/11	9/19	33/63
	Rate	*60%*	*25%*	*80%*	*67%*	*55%*	*47%*	*52%*
Los Angeles	Case Count	14/33	16/34	8/23	7/25	12/31	18/40	75/186
	Rate	*42%*	*47%*	*35%*	*28%*	*39%*	*45%*	*40%*
Louisville	Case Count	3/6	1/2	4/9	6/9	4/17	4/8	22/51
	Rate	*50%*	*50%*	*44%*	*67%*	*24%*	*50%*	*43%*
Orlando	Case Count	2/5	3/8	1/4	4/7	0/2	2/4	12/30
	Rate	*40%*	*38%*	*25%*	*57%*	*0%*	*50%*	*40%*
Seatlle	Case Count	2/4	2/4	3/7	2/2	2/6	n/a	11/23
	Rate	*50%*	*50%*	*43%*	*100%*	*33%*	*n/a*	*48%*

- Jacksonville Sheriff's Office had the highest aggregate CFR at 52%, with 33 of 63 incidents from 2015 to 2020 resulting in fatalities. Charlotte-Mecklenburg had the next highest aggregate CFR at 50%.
- Dallas had the lowest aggregate CFR at 39% followed by Los Angeles and Orlando at 40%. Of note, LASD had 186 total incidents whereas Dallas had only 51 total and Orlando had only 30 total.

Discussion/Limitations

- Validation of fatal outcomes serves as uncertain proxy for validity of non-fatal agency-reported data.
- Unable to validate non-fatal agency data, as crowd-sourced and journalistic databases for non-fatal incidents do not exist and federal regulations do not mandate OIS reporting.
- For firearm injuries, known factors predict if injury will be fatal: type and caliber of gun, the number of impacts and location in relation to vital organs, and distance to the nearest trauma center [4].
- Using only agency data, it is not possible to account for these factors with the exception of distance to trauma center.

Next Steps

- Continue data harmonization and cross-referencing of incidents within victim, officer, and location subsets to ensure uniformity.
- Append Centers for Disease Control and Prevention's Social Vulnerability Index data to incident location data at census tract level.
- Develop statistically appropriate schema to code incidents with multiple officers.
- Identify trauma centers and map distance from incident.
- Compare victim, officer, and location characteristics across fatal and non-fatal encounters and test for significance using appropriate statistical methods, such as Welch t-test for continuous data and Pearson's Chi Square tests for categorical data.

References

1. Hemenway D, Azrael D, Conner A, Miller M. Variation in Rates of Fatal Police Shootings across US States: the Role of Firearm Availability. *J Urban Health*. 2019;96(1):63-73. doi:10.1007/s11524-018-0313-z
2. https://news.vice.com/en_us/article/xwvv3a/shot-by-cops
3. Conner, Andrew, et al. "Validating the national violent death reporting system as a source of data on fatal shootings of civilians by law enforcement officers." *American journal of public health* 109.4 (2019): 578-584.
4. Justin Nix "The problems with OIS data that only capture fatalities"