"Using Crowd-Sourced Data to Explore Police-Related-Deaths in the United States (2000-2017): The Case of Fatal Encounters"

Abstract.

Objectives. We evaluated the Fatal Encounters (FE) database as an open-source surveillance system for tracking police-related deaths (PRDs).

Methods. We compared the completeness of FE data to several known government sources of police-related deaths and police homicide data. We also replicated incident selection from a recent innovative review of the National Violent Death Reporting System.

Results. FE collected data on *n=23,578* PRDs from 2000-2017. A pilot study and ongoing data integration suggest near comprehensive coverage. Advantages of the FE data include circumstance of death specificity, incident geo-locations, identification of involved police-agencies, and near immediate availability of data. Disadvantages include a high rate of missingness for decedent race/ethnicity, potentially higher rates of missing incidents in older data, and the exclusion of more comprehensive police use-of-force and nonlethal use-of-force data—a critique applicable to nearly all extant data sets.

Conclusions. FE is the most comprehensive collection of PRDs in the United States and remains as the most likely source for historical trend comparisons and police-department level analyses of the causes of PRDs.

Policy Implications. FE provides a comprehensive set of PRD incidents for researchers to draw upon and can be used as a gold standard for comparison with future government-mandated data collections, particularly the BJSs arrest-related-death program.

Introduction.

Citizen deaths that occur during interactions with police officers are increasingly viewed by members of the general public and scholars as a public health concern in the United States[1-2]. Although the term "police homicides" is often used in discussions about citizen deaths during police activities, we believe the term "police-related deaths" (PRDs) is more apt, as it captures a broad array of citizen deaths and permits definitional specificity and granularity within the broad parameters of what we have dubbed PRDs. PRDs include, among other things, police homicides (law enforcement officers killing citizens, justifiably or otherwise), citizens who die in automobile accidents during vehicle pursuits, citizens who suffer medical emergencies during interactions with police, and citizens committing suicide with police on-scene. Among these, police homicides, especially those caused by the discharge of a firearm, have received the most attention for the potential public health and community problems they pose[1].

In a recent commentary in the New England Journal of Medicine, Crosby and Lyons argue that police homicides (which they call "legal intervention deaths") "are not only devastating to the victims' families and the directly affected communities or neighborhoods; … they represent a significant public health burden and can incite further violence in which more people are killed"[2]. Based on their analysis, Crosby and Lyons call for a public health study of police homicides that systematically assesses the scope and nature of such deaths. A related commentary echoes Crosby and Lyons' argument, noting that citizens being killed by the police "affect[s] the well-being of the families and communities of the deceased"[1]. Research also suggests that, beyond their impact on victims, families, and communities, police homicides can have long-lasting

physical and mental health consequences for police officers, many of whom experience symptoms of "post-shooting stress disorder"[3-5].

An in-depth understanding of the public health impact of police homicides and other PRDs requires thorough knowledge of the scope and nature of such deaths. Unfortunately, however, we lack reliable and comprehensive data about these sorts of deaths and the circumstances surrounding them. No public surveillance system in the United States counts PRDs and the government data collection efforts intended to capture some aspect(s) of the PRD phenomenon —for example, a) the Federal Bureau of Investigation's Supplemental Homicide Reports, b) the Bureau of Justice Statistics' Arrest-Related Deaths Reports, and c) the Centers for Disease Control's National Violent Death Reporting System—are inconsistent and unreliable[6-8]. In recent years, however, some citizens have responded to the flaws in these official government-produced sources by developing data sets designed to produce more accurate and complete counts of citizens who die during interactions with police officers.

These unofficial data rely on internet crowd-sourcing and other data collection efforts conducted by the public to catalogue some aspect(s) of PRD's; several researchers have suggested that these efforts may capture more citizen deaths[9] and may therefore be the best current strategy for collecting data on PRD's[10]. Unfortunately, very little is known about the quality of the information contained in data sets produced by citizen researchers. The primary aim of this paper is to further our understanding of unofficial data collections by analyzing the relative advantages, limitations, and completeness of one of the most prominent sources of PRD data assembled by citizens to date: the Fatal Encounters Project (http://www.fatalencounters.org/).

We start by reviewing available government-based data as well as the new citizen-based effort of Fatal Encounters. We then assess the relative merits of Fatal Encounters as a data source for understanding the scope and nature of PRD's in the U.S. and we develop a nomenclature of PRD's that directly compares Fatal Encounters with other data sources. We end by describing two new data sets in development that utilize the FE data and suggest new areas of research that could result from these sources.

Extant Data Sources. Given the general ease with which demographers track deaths in the United States—the result of vigilant and thorough government record-keeping—it seems that tracking PRDs, and more specifically police homicides, should be relatively easy. Unfortunately, this is not the case. This situation has been lamented by criminologists for four decades as members of the academic community have repeatedly echoed the concerns of the 1967 Kerner Commission and noted the liabilities of official police homicide data sources, calling for the development of a sound police homicide data collection program[11,12]. Currently, government-funded criminal justice data collections are comprised of two sources: 1) the voluntary justifiable homicides (JH) portion of the Supplemental Homicide Reports collected under the Uniform Crime Reporting System of the FBI, and 2) the piecemeal Department of Justice's arrest-related-death (ARD) data that is part of the Deaths in Custody Reporting Program (DCRP). Researchers have long known that these data contain substantial omissions[12-15] and an internal review by the Bureau of Justice Statistics (BJS) notes that a majority of incidents may be missing from the arrest-related-death data[16], which have not been reported publicly since 2009. Currently, data from only 750 of approximately 17,985 (4.2%) law enforcement agencies voluntarily submit incidents to JH[6,7], and the BJS reports that between 31-41% of ARD in 2011 were not captured, with approximately 50%

uncaptured for years prior (2003-2009)[21]. While an overwhelming majority of police departments have zero police homicides each year, the shortcomings of both the JH and ARD programs result from both a lack of participation as well as the failure to identify many incidents of PRDs.

Federally Mandated and Other Data Collection Efforts. The DCRP has been recently mandated to cover all law enforcement agencies[19] and is moving ahead with plans to collect pilot data; however, the ARD program relies on data submission from a State Reporting Coordinator (SRC) from each state[20], not reports mandated from each police-department. Each SRC must collect his/her own data as law enforcement agencies are not required to systematically document or report incidents. These coordinators rely either exclusively (39%) or exclusively/partially (73%) on internet searches of news sources, while fewer than 20% use a law enforcement survey[21]. Going forward, we can expect this federally mandated program to continue to fail to capture a signification portion of PRDs—independent of the program being made mandatory for all states.

Given the clear liabilities of the DOJ data sources, some researchers have turned to other government data sources to measure police-related deaths, including: a) the National Vital Statistics Survey (NVSS), which is based on death certificates, and b) the National Violent Death Reporting System (NVDRS), which is based on death certificates characterized as having resulted from "legal intervention. While innovative studies using the NVDRS have found this a much more promising approach to quantifying the extent of homicides by police[25,26]. As of 2016, 40 states plus DC and Puerto Rico participated in the NVDRS with plans to incorporate all states in coming years. However, an important drawback of the NVDRS is that it is quite limited as a data source for measuring trends over time. Only 6 states participated in the NVDRS in 2003, and just 32

participated in 2015. Additionally, the NVDRS's reliance on an externally derived legal intervention classification may lead to omissions from coroners due to missing or withheld information by police departments.

In addition to the just mentioned non-DOJ government data sets, some scholars have turned to crowd-sourced, internet-based sets developed by citizens, such as Killed by Police, The Counted, The Washington Post, Mapping Police Violence, and Fatal Encounters. However, very little is known about their quality, completeness, or reliability as data sources for quantifying the scope and nature of police-related deaths. To better our understanding of the strengths and weaknesses of citizen-based data sets that catalogue PRDs, we examine one of the most prominent citizen-based data sources assembled to date: the Fatal Encounters Project.

Unofficial PRD Data: Fatal Encounters. Fatal Encounters Dot Org (FE) is a 501(c)3 nonprofit organization. The project describes itself as "A step toward creating an impartial, comprehensive, and searchable national database of people killed during interactions with law enforcement". FE compiles data on all PRDs that have occurred since 2000. For the entire nation, FE documents 23,568 incidents of PRDs between the years 2000 and 2017; the file is publicly available as an incident level file (i.e., one row per death). These deaths include police homicides, deaths that occur due to suicides in police presence, accidental deaths during foot-pursuit, and accidental and use-of-force deaths during vehicular pursuits. FE reports the detail of each incident of a PRD, allowing researchers ~~the ability~~ to explore highly varied circumstances.

Data for FE are collected using three methods: 1) Freedom of Information Act (FOIA) and other public records requests of law enforcement agencies, 2) crowdsourcing internet searches

by volunteers and paid researchers, and 3) cross-checking of data with newly developing online websites such as those by The Guardian and Washington Post. Duplicates are easily resolved by making deterministic matches on age of decedent, date of incident, city of incident, and name of decedent. Incidents are checked on a case-by-case basis through a comparison of the news stories contained in the URL field of each incident, by the FE curator, D. Brian Burghart.

News report verification has been obtained for virtually all documented incidents in FE through Google searches and a combination of online local and national newspaper archives, including: Newslibrary.com, Newspapers.com, and Lexis-Nexis. Although it is impossible to know how many PRDs are undocumented in news stories, cross-validation with more recent data collections, and a pilot survey (see below) engender confidence that the data collection in FE is generally comprehensive. Newspapers and online news stories have both shown to be excellent sources of injury surveillance and reporting for a variety of issues in the United States[27-31]. Further, the use of crowdsourcing of online/print news stories has shown to be a valid method to comprehensively assess prevalence for social and behavioral research in public health[32]. Finally, crowd-sourcing is a relatively low cost and efficient way to collect information on well reported events such as PRDs.

Advantages of FE. Although, as noted above, there are several crowd-sourced data sources that collect information on police homicides, Fatal Encounters is known to be a much more extensive source of data on PRDs in general, and police homicides in particular[33,34]. FE collects data as far back as 2000 and contains a much more extensive set of variables than other data sources. First, Fatal Encounters collects an extensive array of police-related deaths with a diverse set of causes and circumstances (see Table 1). This gives researchers the flexibility to

explore diverse characterizations of deaths that work best with their research agendas. FE documents 23,568 incidents of PRDs from 2000-2017 for the entire nation.

While incidents that would almost always be defined as police homicides (see e.g., gunshots and bludgeoning) comprise a substantial proportion of these 23,568 police-related deaths—several PRDs include circumstances of death, like asphyxiation, that are unlikely to be reported in death certificates or official government sources. Further, although gunshots are the most prevalent circumstance of police-related deaths, Table 1 reveals that various other circumstances account for a non-trivial portion of PDRs and that vehicular pursuits are the second most prevalent. According to Table 1, suicides during an arrest are the third most prevalent police-related death in FE; while many of these are instances of individuals turning a gun on themselves during a pursuit, others reflect grayer areas such as decedents who intentionally burned their homes during standoffs or who drowned while evading arrest. Again, careful coding and transparency in FE will allow researchers to make their own determinations for their particular analyses.

(table 1 about here)

A second advantage of FE is that its collection of data back to 2000 allows for important trend analyses of police-related deaths; however, it is important to note that changes in internet data storage, spotty historical reporting, and aging of stories may bias long-term trend analysis. Third, and perhaps most importantly, FE identifies a death as police-related based on reports and follow-up reports made by journalists. Thus, it is not subject to the biases and social pressures that may inform whether a death is identified as the result of police involvement in an official

document like a death certificate. For example, deaths ruled accidental in autopsy reports, may in fact be police-related deaths (see e.g., http://homicide.latimes.com/post/david-silva/) and autopsy declarations by forensic pathologists can be heavily influenced by police information, particularly in instances in which this information is provided by a sheriff-coroner, a position seemingly rife with inherent conflicts of interest (https://www.kqed.org/news/11633330/autopsy-doctor-quits-alleges-sheriff-interfered-in-death-probes).

Fourth, every incident of a PRD in FE is linked to an address that has been geo-coded to various levels of geographic precision. To date, 97% of the 23,568 incidents of police-related deaths in FE have been geo-coded to an exact latitude/longitude. A pilot assessment of the quality of these geo-codes using 15 years of police-related deaths in New York City (n =384) found that addresses could be described by four tiers of specificity[33]: Tier 1) 90.3% of incidents could be identified by an exact street address or name/cross-street combination (predicted error of ±50m); Tier 2) 1.3% identified by *hundreds blocks* ("800 block of Main Street", e.g.; predicted error ±200m); Tier 3) 7.5% roads ("I-84", e.g.; predicted error ±1,000-100,000m); Tier 4) 0.7% places ("College of Staten Island", e.g.; predicted error 1000m); and Tier 5) 0% no address. Of course, since FE data are open-source, errors can be (and are) corrected as needed.

Fifth, nearly all PRDs in FE are accompanied by news stories which allows for a careful micro-analysis of each incident. These stories are the source of the primary characterization of the circumstance of death and can be converted into usable quantifiable variables so that researchers can make data selections without having to analyze each incident individually. Sixth, unlike the government sources of police homicide data, which can take several years for public

174 release, FE's ongoing data collection efforts, duplicate checks, and data cleaning, lead to incidents
175 being released within one week of the date of death, often within a day or two.

176 Seventh, variable availability in FE is much more extensive than other sources and includes
177 the following: decedent's full name, decedent's age, decedent's gender, decedent's
178 race/ethnicity, URL image of decedent, date of incident/death, location of death
179 (address/city/state or block-face address/city/state), zip code of death, GPS coordinates, agency
180 involved (police department name), circumstances of death (gunshot, vehicle, stun-gun,
181 bludgeoned with instrument, beaten, medical emergency, asphyxiated, domestic violence,
182 stabbed, drug overdose, bean bag rounds, other), details of the death (e.g., routine arrest,
183 suspicion of activity, weapon present, decedent shots fired), indicators of symptoms of mental
184 illness in the victim (e.g., suicidal threats, law enforcement called by family to assist with mentally
185 ill family member), judicial disposition (justified, excusable, criminal, pending investigation, and
186 others), links to news articles, and a unique identifier. Perhaps the most important variable in FE
187 that is missing from nearly every other source is the identification of the police agency(ies)
188 primarily responsible. This is essential for analyses that explore police-department level policies
189 and how they affect the prevalence of police-related deaths (see descriptive analysis below).

190 Finally, FE are open-sourced-data; corrections and omissions can be submitted by the public
191 and although the ultimate determination for what appears in the file is determined by the FE
192 curator, transparency is the primary motivating force behind the data collection and reporting,
193 allowing individual researchers to make their own determinations. The incorporation of all
194 published sources of data, combined with crowd-sourcing, and careful investigative journalism

by the FE curator, has led to the most extensive, historical, and transparent collection of police-related deaths available in the United States.

Limitations of FE. An important limitation of FE is that there is no gold standard with which to compare the completeness of the incidents collected in FE. In fairness, this is true for every data source being used to quantify police-related deaths. A pilot study assessing the completeness of the FE data involved making FOIA requests of a random sample of 328 law enforcement agencies in a sample of 11 states (CT, FL, MA, ME, MT, NH, NV, NY, OR, RI, SD) was recently undertaken in order to assess the comprehensiveness of FE data for 2000-2015[33]. Responses were obtained from 246 (75%) of the sampled agencies and it was found that FE data are *fully complete for 9 of the states* sampled. Data were missing for only 1 incident in CT (92% complete) and 8 in FL (95%); these incident news-stories have been located and added to the data. This pilot study further noted that FE data contained a substantial number of incidents that were not reported by police departments through public records requests. Additionally, although FE is the only online project to collect data before 2012—the Killed by Police (KBP) database collects data for May 2013-2018—compared to KBP, FE was 99.1% complete while KBP was 91.4% complete compared to FE for the years of overlap examined (2013-2015)[33].

A second limitation of FE is that it is possible that the reporting of older incidents is less complete due to a reduced political impetus to report PRDs and the deletion of old internet news stories (although the FOIA pilot did not indicate that older incidents were more likely to be missing from FE). A third limitation, and this critique applies to virtually all sources of PRD data (c.f., Vice News non-fatal police shootings), is that incidents reported by FE are only fatal outcomes and do not reflect the full continuum of police-related violence, gunshots that miss

their target, and nonfatal gunshots and other uses of force that result in injury. Ultimately, researchers will need to document and collect this wide range of data to fully understand police use of force.

A fourth limitation with FE concerns missing data. While missingness is rare for most variables (e.g., name of decedent 2.7%, age 2.8%, gender 0.2%), nearly 40% of the cases (38.9%) are missing information about decedents'' race/ethnicity. This is largely because this variable is coded based on news reports and accompanying photos in reported or related news stories. Efforts are currently underway to vastly reduce missingness in this variable, including the use of Bayesian-informed surname geo-coding[35] and deterministic linkages to restricted death certificate data using county codes from the National Association for Public Health Statistics and Information Systems (NSPHSIS).

Completeness of FE Data. To assess the completeness of FE, we first compared various circumstances of PRDs in FE to the DOJ's arrest-related deaths (ARD) program (2000-2016) and the FBI's justifiable homicides (JH) data (2003-2009). Although we include/exclude particular circumstances of deaths in each iteration, we use groupings that are most comparable for each data set comparison. For instance, panel 1 (the upper left panel) of Figure 1 compares all incidents of PRDs and finds that FE has as few as 1.55 times the number of incidents as ARD in 2004 and as many as 1.92 times the number of incidents in 2008. Compared to JH, FE has as few as 2.43 times the number of incidents in 2001 and as many as 3.78 times the number of incidents in 2013. Excluding suicides in police presence (see panel 5), FE still has as few as 1.39 times the number of incidents (2004) and as many as 1.72 times the number of incidents as ARD (2013). In fact, FE contains more incidents than both JH and ARD, no matter which types of PRD are

239 counted, including: only intentional use of force (panel 2), intentional use of force plus vehicular
240 homicides (panel 3), intentional use of force plus vehicular homicides and foot pursuit deaths
241 (panel 4), and intentional use of force plus vehicular homicides, foot pursuit deaths, and medical
242 emergencies and overdoses (panel 5). Finally, using a fairly restrictive definition of police
243 homicides that includes only intentional use of force and vehicular pursuit homicides (panel 6)—
244 the number of police homicides as a percentage of the total number of population-based
245 homicides has been steadily rising from a low of 5% in 2000, to a peak of 11.1% in 2013 and 2014,
246 with a decline to 9.0% in 2015.

247 (figure 1 about here)

248 Next, we replicated a strict criterion definition and selection for police homicides (2005-2012)
249 that was detailed in a recent publication[9] that was found to be far superior to the NVSS and ARD
250 data sources. Using these precise definitions, we found that overall, FE documented 10% more
251 incidents of police homicide than the NVDRS (see Table 2).

252 (table 2 about here)

253 Efforts are underway to identify the cases from NVDRS that are missing in FE for Maryland and
254 North Carolina. However, as we note, FE collects data on all police-related deaths and for all
255 states, and in this respect, the number of incidents far exceeds all extant data sources.

256 **Comparison of PRDs to Crime Rates**. Scholars have long surmised that PRDs might well be related
257 to crime rates in police jurisdictions[6,7]. The identification of involved departments in FE is one of
258 the primary advantages of this data set as it allows for comparison of PRD death rates as well as
259 analysis of police-department characteristics and their relationship with PRDs. As a purely

descriptive exercise, we computed PRD rates using a) census population estimates for all intercensal years (2000-2017), b) counts of *all* PRDs from FE, and c) crime rates by PD jurisdiction from the FBI Uniform Crime Reports. We present results from the five largest police departments in the US: NYPD, Chicago PD, LAPD, Philadelphia PD, and the Houston PD. Panel 1 (upper left corner) of figure 2 shows that there is substantial variation in the PRD rate by police-department, and over time. Perhaps surprisingly, given the sheer number of high-profile PRDs in NY (e.g., Eric Garner and Sean Bell), the PRD rate for the NYPD is among the lowest for all years for each of the five largest police departments. This may be a reflection of the relatively lower crime and murder rate, so we adjust for crime rates in subsequent comparisons. Results indicate that the lower overall NYPD rate is partially explained by, but not singularly reducible to either violent crime (panel 2), the murder rate (panel 3), nor the aggravated assault rate (panel 4). LAPD shows the highest PRD rate relative to the violent crime and aggravated assault rate (Chicago violent crime data not currently available), and both LAPD and HPD show the highest rates relative to the murder rate. Perhaps the most remarkable trend, other than for NYPD, is the increasing rate of PRDs relative to the crime rate over time. In short, these descriptive comparisons show that PRDs are at least partially a function of crime rates, demonstrate substantial variability by department, and show trends of increasing PRD rates, despite an overall drop in crime rates over the past decades.

(figure 2 about here)

Next Steps: The National Police-Related Death Database (NPRDD) and the National Police-Related Death Contextual Database (NPRDCD).

We are also in the process of creating two unique data sets, based on the incident-level PRD file from FE. First, we are creating a National Police-Related Death Database (NPRDD) which will merge information from several data sources, including: PRD counts from Fatal Encounters, socio-demographic data from the Census/American Community Survey, data from the Law Enforcement Officers Killed and Assaulted (LEOKA), crime data from the FBI's Uniform Crime Reports, hospital emergency room data from the American Hospital Association's annual survey, gun counts and gun violence from various sources, and police-department demographics and policy from both the Census of Local Law Enforcement Agencies (CSLLEA) and the Law Enforcement Management and Administrative Statistics (LEMAS). The unit of analysis will be PD/years so that researchers will be able to test relevant hypotheses related to the policy-level determinants of police homicides. Second, we are creating the National Police-Related Death Contextual Database (NPRDCD) which will provide geo-locations for every PRD incident in the United States, combined with variables available that describe the circumstances of each incident. Researchers will be able to use this file to study spatially-related hypotheses and link the NPCHD data to individual-level that allow for a study of the effects of PRDs on community health and well-being, and police/community relations. These data sets will be widely disseminated for public use, and they will be placed in a data repository and a project website for easy researcher access.

Discussion and Conclusions. The deaths in custody reporting program (DCRP) will be the only government authorized collection of police homicide data for the United States going forward. However, as noted, an internal review of this data collection system discovered large holes in coverage that were not simply reducible to voluntary data submission[21]. One fairly easy system

to implement would involve local department and precinct documentation of all officer-involved shootings, fatal and otherwise, which would then be uploaded to a central location for aggregation and analysis. Of course, as we have noted, this process—while collecting missed shots, injuries, and fatalities—would also exclude a large portion of police-related deaths due to non-firearm related violence such as car chase fatalities, asphyxiation, and stun-gun deaths. As a result, the best option to date, may be the collection of all police-related-death data, as is done in Fatal Encounters. This allows for crowd-sourcing incidents, makes the data open-source and usable by anyone, and eliminates error-prone or intentionally false decision-making as to which incidents to document. Preliminary analysis of FE notes minor holes in the data set, but finds that FE may contain the most comprehensive set of police-related-deaths in the United States for nearly two decades. Trend analysis should be limited to more recent years, but the identification of involved agencies, allows for police-department-level of analyses of PRDs, which could ultimately lead to policy-relevant changes in how police conduct their daily business, and ultimately contribute to decreasing the abhorrently high levels of violence and homicide in the United States.

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Table 1: Circumstance of Death by Year in Fatal Encounters

Police-Related Deaths (PRD)	'00	'01	'02	'03	'04	'05	'06	'07	'08	'09	'10	'11	'12	'13	'14	'15	'16	'17	Total
Intentional Use of Force (IUF)																			
Asphyxiated/Restrained	19	16	22	9	10	12	19	8	5	9	13	7	12	12	3	8	16	15	215
Beaten/Bludgeoned	13	10	9	8	14	7	7	9	8	6	7	10	9	10	8	17	6	1	159
Burned/Smoke Inhalation		5	1		3	2		2				5	2	1	0	1	1	2	25
Chemical agent/Pepper spray	2			2	4	4	6	2	1	1	2		1		4	1		1	31
Gunshot	484	566	574	632	653	683	723	712	705	779	776	924	994	1058	1022	1057	1052	1090	14484
Stabbed	7	1		1	1	1	2		1	2	2	2		1	1			1	23
Tasered			11	14	41	74	79	69	67	54	66	60	51	43	39	60	40	35	803
Vehicular Pursuit (V)	193	204	234	240	182	216	252	257	248	251	228	206	245	465	495	272	206	358	4752
Foot Pursuit (FP)																			
Fell from a height	4	1	4	2		4	4	3	4	1	2	2	6	2	4	1	3	1	48
Drowned	7	4	10	8	6	9	7	6	11	2	12	10	3	4	10	8	3	3	123
Medical Emergency (ME)																			
Medical emergency	10	9	8	19	17	26	16	33	24	7	23	27	19	39	19	30	14	4	344
Drug overdose	4	4	4	5	7	10	19	13	5	10	5	15	10	12	15	18	5		161
Suicide (S)	70	97	101	89	96	101	119	131	125	126	147	130	133	132	84	113	229	238	2261
Other/Unknown																			
Other	1	1	2	22		1	3	2	1	1	0	2	2	2		2	4	1	47
Undetermined	3	4	6	6	7	3	7	8	6	6	5	14	2	4	8	8	4	1	102
Total	817	922	986	1057	1041	1153	1263	1255	1211	1255	1288	1414	1489	1785	1712	1596	1583	1751	23578

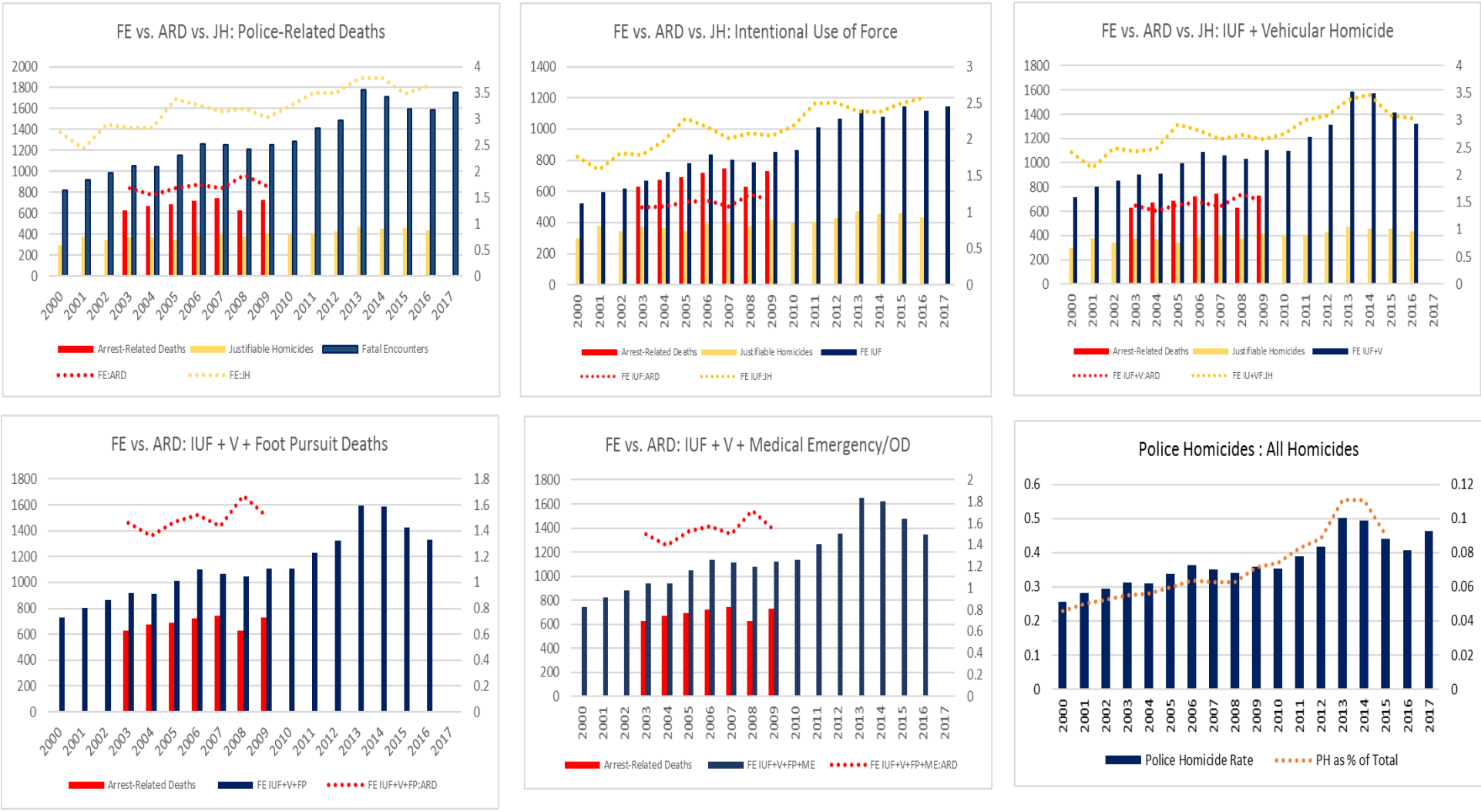
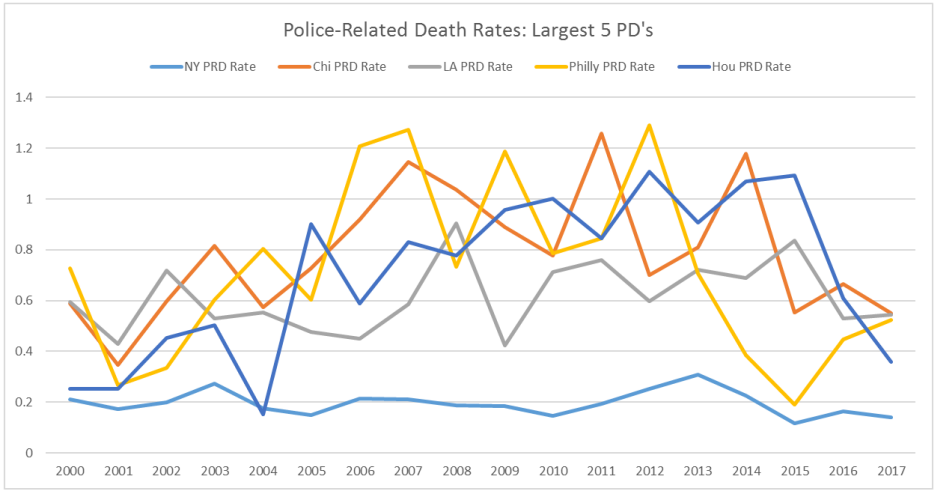
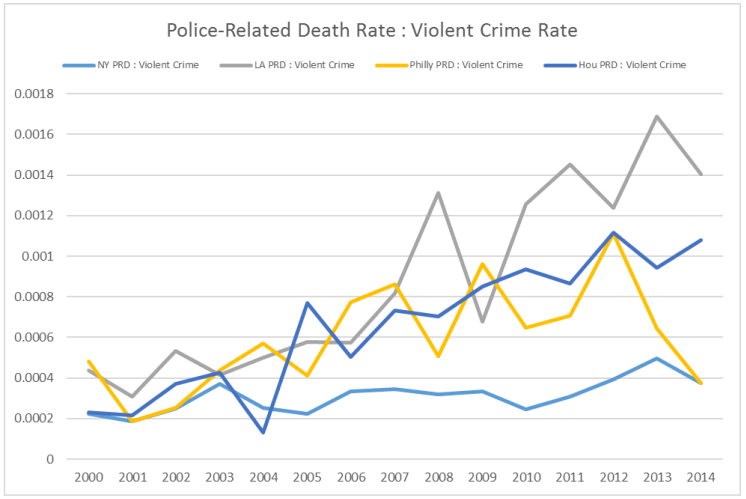


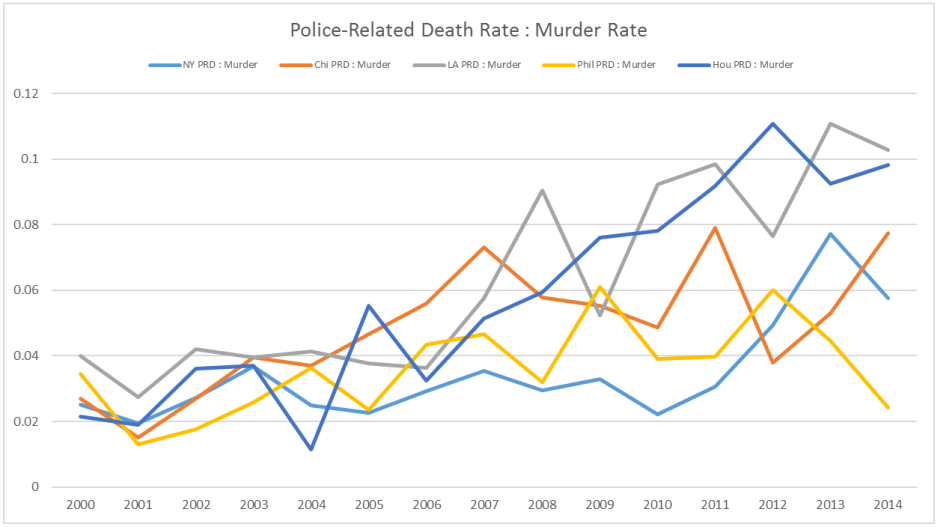
Figure 1: Fatal Encounters Officer-Related Deaths compared to DOJ Arrest-Related Deaths and FBI Justifiable Homicides.

Table 2: Replication of Selection Criterion and Comparison with Barber et al., 2016.

State	NVDRS No. (Rate)	NVDRS Abstractor No. (Ratio)	NVSS No. (Ratio)	SHR No. (Ratio)	FE No. (Ratio)
Alaska	24 (0.43)	26 (1.08)	10 (0.42)	0 (0.00)	25 (1.04)
Colorado	119 (0.30)	100 (0.84)	77 (0.65)	60 (0.50)	133 (1.12)
Georgia	228 (0.30)	184 (0.81)	108 (0.47)	92 (0.40)	279 (1.22)
Kentucky	66 (0.19)	45 (0.68)	37 (0.56)	19 (0.29)	76 (1.15)
Maryland	177 (0.39)	178 (1.01)	128 (0.72)	164 (0.93)	163 (0.92)
Massachusetts	46 (0.09)	46 (1.00)	36 (0.78)	6 (0.13)	52 (1.13)
New Jersey	95 (0.14)	95 (1.00)	31 (0.33)	82 (0.86)	121 (1.27)
New Mexico	82 (0.51)	78 (0.95)	66 (0.80)	41 (0.50)	87 (1.06)
North Carolina	166 (0.22)	161 (0.97)	33 (0.20)	43 (0.26)	133 (0.80)
Oklahoma	103 (0.35)	103 (1.00)	37 (0.36)	78 (0.76)	122 (1.18)
Oregon	91 (0.30)	95 (1.04)	94 (1.03)	29 (0.32)	99 (1.09)
Rhode Island	13 (0.15)	13 (1.00)		2 (0.15)	13 (1.00)
South Carolina	77 (0.21)	35 (0.45)	45 (0.58)	20 (0.26)	107 (1.39)
Utah	67 (0.31)	66 (0.99)	50 (0.75)	21 (0.31)	71 (1.06)
Virginia	119 (0.19)	118 (0.99)	104 (0.87)	39 (0.33)	133 (1.12)
Wisconsin	79 (0.17)	78 (0.99)	50 (0.63)	46 (0.58)	88 (1.11)
Total	1552 (0.24)	1421 (0.92)	906 (0.58)	742 (0.48)	1702 (1.10)







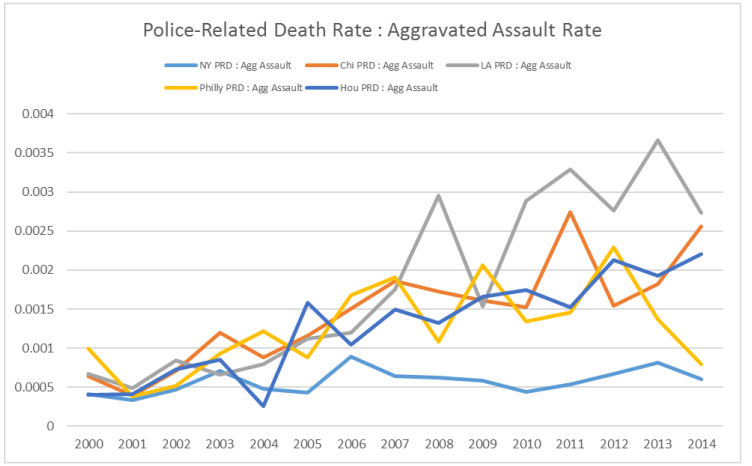


Figure 2: Police-Related Death Rates (5 largest departments), Overall and by Police-Department Jurisdiction Crime Rate.