




Racial inequity in fatal US police shootings, 2015–2020

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ABSTRACT

Introduction Violent encounters with police represent a significant cause of morbidity and mortality in the USA, especially among Black, Indigenous, and People of Colour (BIPOC). This study characterises trends in fatal police shootings overall and by armed status and quantifies inequities in mortality burden and years of life lost (YLL) across racial/ethnic groups.

Methods Longitudinal study of *Washington Post* data on fatal police shootings in the USA using generalised linear-mixed models to capture trends with time and relative rates.

Results This study shows that the rate of fatal police shootings for Black, Indigenous, and People of Colour (BIPOC) is constant from 2015 to 2020. Further, BIPOC have significantly higher death rates compared with Whites in the overall victim pool (Native American RR=3.06, Black RR=2.62, Hispanic RR=1.29) and among unarmed victims (Black RR=3.18, Hispanic RR=1.45). Native American (RR=3.95), Black (overall RR=3.29, unarmed RR=3.49) and Hispanic (RR=1.55, unarmed RR=1.55), victims had similarly high rates of YLL relative to Whites.

Conclusion Fatal police shootings are a public health emergency that contribute to poor health for BIPOC. Urgent attention from health professionals is needed to help drive policy efforts that reduce this unjust burden and move us towards achieving health equity in the US.

INTRODUCTION

Interactions with police are an important cause of morbidity/mortality, particularly for Black, Indigenous, and People of Colour (BIPOC) in the USA. Since the fatal police shooting of Michael Brown, an unarmed Black man in Ferguson, MO, police violence has received increased societal scrutiny. Previous studies have demonstrated that BIPOC experience a disproportionate mortality burden due to police violence, both in terms of net fatalities¹ and years of life lost.² Nevertheless, little is known about how the rate of police killings of BIPOC has changed over time. To address this critical knowledge gap, we examined overall and racial/ethnic group trends in fatal police shootings from 2015 to 2020, with additional attention directed at the rate at which unarmed individuals are killed by the police. We also quantify the disproportionate burden of fatal police shootings on BIPOC death rates and years of life lost during the study period.

METHODS

Data

This study uses publicly available data on fatal police shootings provided by the *Washington Post*. The repository aims to collect information on every person killed by on-duty police officers in the USA.³ Their methodology includes monitoring local news reports, independent databases and additional reporting handled by the *Post*. Their data include victim race, age and sex, as well as details about any item in the victim's possession that was perceived as a weapon. Two independent coders categorised the weapons into the following groups: blunt, firearm, knife, sharp (non-knife), stun, other, and none (unarmed), and reviewed discrepancies to reach an agreement. Tools, toys and debris were categorised as unarmed because of the low likelihood of immediate lethal force. Examples of items possessed by victims that were not treated as weapons in our analysis were 'air conditioner', 'chair', 'wasp spray', 'pen', and 'shovel'.

Trend analysis

We calculate the death rate and years of life lost (YLL) for all fatal police shootings per quarter per million (pqpm) from 2015 to the first quarter of 2020, and for fatal police shootings with an unarmed victim per half-year per million (phpm), from 2015 to 2019, by race/ethnic group. YLL is a summary measure of premature deaths that gives greater weight to death at a younger age. Denominators for rates are racial/ethnic group US population size estimates from the American Community Survey (ACS) for 2015–2018 with linearly extrapolated estimates for 2019 and 2020, for which ACS data are unavailable.⁴ We compare longitudinal trends using negative binomial generalised linear-mixed models (GLMMs) with fixed and random effects for both race and time.⁵ Rate ratios (RR) and 95% CIs are provided for Asian, Black, Hispanic and Native American populations relative to the White population for all fatal police shootings. CIs that do not span 1 indicate statistical significance at the type I error rate of $\alpha=0.05$. Asian and Native Americans are excluded from the unarmed victim trend analysis because of low counts. We estimate YLL based on the life expectancy for US citizens in victim birth year as the difference between life expectancy and age at death, consistent with previous studies.² Data on US life expectancy by birth year were obtained from *statista* based on historical data from the UN Department of Economic and Social Affairs.⁶



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This study uses publicly available data and was therefore exempt from IRB approval.

RESULTS

There were 5367 fatal police shootings reported by the Washington Post from 2015 to May 2020. A total of 627 were excluded from the analysis because race was unknown ($n=580$) or marked as 'other' ($n=47$), leaving a total of 4740 deaths for analysis. Of those, age was not reported for 87 victims, leaving 4653 deaths included in the YLL analysis. Most victims were White (51%), followed by Black (26.7%), Hispanic (18.8%), Asian (2%) and Native American (1.6%). The median age of victims was 34 and varied across groups with younger Black victims (median age=30) and older White victims (median age=38) (table 1).

There was a small, but statistically significant decline in death rate for White victims with a rate ratio of 0.99 (95% CI 0.98 to 0.995), indicating an estimated 1% decline in deaths based on the GLMM. For all other race/ethnic groups there were no significant trends in death rates. No group showed a significant trend in YLL (figure 1). By group, mean deaths pppm were highest among Native Americans (1.74 pppm), followed by Blacks (1.49 pppm), Hispanics (0.74 pppm), Whites (0.57 pppm) and Asians (0.25 pppm) (table 1). Native Americans, Blacks and Hispanics had significantly higher rates than Whites with RRs of 3.06 (95% CI 2.42 to 3.86), 2.62 (95% CI 2.41 to 2.86) and 1.29 (95% CI 1.18 to 1.42) respectively, while Asians had a death rate significantly lower than Whites (RR=0.44, 95% CI 0.36 to 0.55) (table 1). Similar relative trends were noted for YLL (figure 1 and table 1).

A subset of 753 (15.9%) fatal police shootings had unarmed victims. There were no significant trends in deaths or YLL for any group. Relative trends by race/ethnicity in the death and YLL rates were consistent with the overall analysis, with Black and

Hispanic victims being killed at higher rates than White victims and contributing significantly more YLL (figure 1 and table 1). The age distribution among unarmed victims was younger than the overall victim pool (table 1).

DISCUSSION

By capturing the persistent and longitudinal trend of disproportionate mortality and YLL due to fatal police shootings among Black, Hispanic and Native American populations over the last 5 years, this study extends previous work that demonstrated this inequity based on narrower time windows.^{1 2} Further, this study is novel in its demonstration that mortality and YLL burden for BIPOC have not decreased, and that it exists even among unarmed victims.

This study is not without limitations. Our analysis relies upon news reports curated by the *Washington Post*, necessarily excluding incidents that did not attract media attention. However, previous studies have shown that media data on fatal police encounters are more complete than centralised federal databases.⁷ Second, our data did not capture gender minority status, which may obscure an intersectional moderator of police violence. Also, serious injury can occur without firearms as was the case with George Floyd, who died of asphyxiation, and Emerald Black, a visibly pregnant woman whose violent arrest reportedly lead her to miscarry in police custody.⁸ Lastly, we excluded missing data from our analyses which could potentially bias our results. However, given the strength of the association measures observed here, it is unlikely that the severe inequities in fatal police shootings among Black and Indigenous People of Colour can be completely explained by potential bias attributable to missing data.

We found an annual average of 31 960 YLL due to fatal police shootings in the USA, which is 83% of that due to

Table 1 Fatal police shootings by race/ethnicity, 2015–2020

All fatal police shootings							
Race/ethnicity	Deaths			Years of life lost			Age
	N [%]	Mean quarterly rate per million	Rate ratio [95% CI]	N [%]	Mean quarterly rate per million	Rate ratio [95% CI]	Median [IQR]
Asian	93 [2.0]	0.25	0.44 [0.36, 0.55]	3408 [2.0]	9.09	0.49 [0.38, 0.62]	35.0 [27.5–44.5]
Black	1265 [26.7]	1.49	2.62 [2.41, 2.86]	52 186 [30.1]	61.5	3.29 [2.59, 4.17]	30.0 [24.0–38.0]
Hispanic	889 [18.8]	0.74	1.29 [1.18, 1.42]	35 098 [20.3]	29.01	1.55 [1.22, 1.97]	33.0 [25.0–40.0]
Native American	77 [1.6]	1.74	3.06 [2.42, 3.86]	3266 [1.9]	73.75	3.95 [3.11, 5.02]	31.0 [25.0–36.0]
White	2416 [51.0]	0.57	1.00 [Reference]	79 158 [45.7]	18.72	1.00 [Reference]	38.0 [30.0–50.0]
All	4740	0.71	–	173 116	25.84	–	34.0 [27.0–45.0]
Fatal shootings with unarmed victim							
Race/ethnicity	Deaths			Years of life lost			Age
	N [%]	Mean biennial rate per million	Rate ratio [95% CI]	N [%]	Mean biennial rate per million	Rate ratio [95% CI]	Median [IQR]
Asian*	11 [1.5]	–	–	410 [1.4]	–	–	30.0 [25.2–43.0]
Black	218 [29.7]	0.52	3.18 [2.63, 3.85]	9107 [31.3]	22.00	3.49 [2.74, 4.45]	30.0 [23.0–37.0]
Hispanic	146 [19.9]	0.24	1.45 [1.17, 1.79]	5930 [20.4]	9.76	1.55 [1.21, 1.98]	32.0 [24.0–40.0]
Native American*	8 [1.1]	–	–	346 [1.2]	–	–	29.5 [25.0–37.5]
White	352 [47.9]	0.16	1.00 [Reference]	13 306 [45.7]	6.29	1.00 [Reference]	34.0 [26.0–44.0]
All	735	0.21	–	29 099	8.51	–	32.0 [25.0–41.0]

All rates are crude estimates and all rate ratios are estimated using negative binomial generalised linear-mixed models.

*Asian and Native American victims were excluded from the unarmed trend analysis due to low counts.

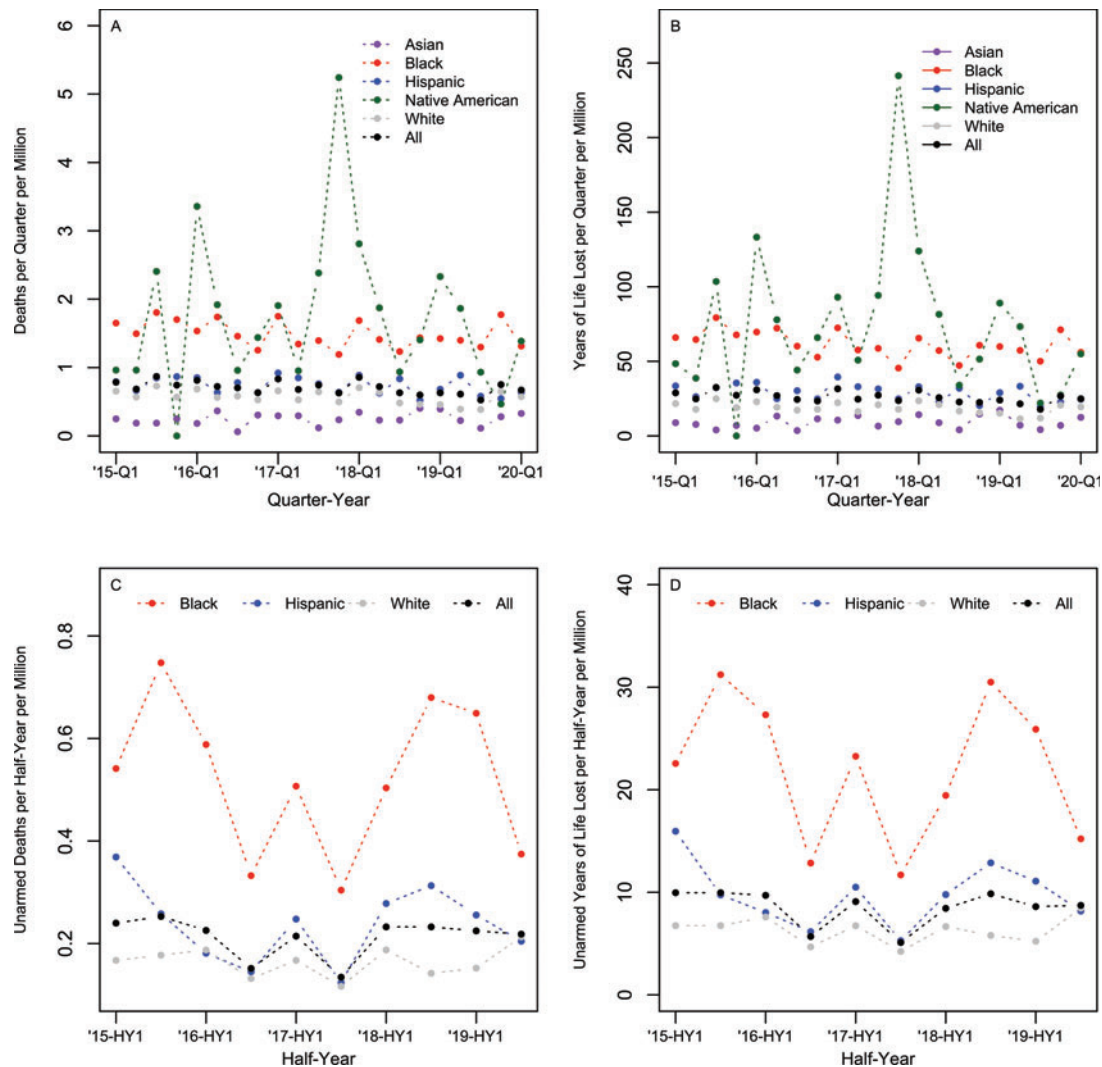


Figure 1 Trends in fatal police shootings by race/ethnicity, 2015–2020. (A) All victims, quarterly death rates per million by race/ethnicity. (B) All victims, quarterly years of life lost (YLL) rates per million by race/ethnicity. (C) Unarmed victims, biennial death rates per million by race/ethnicity. (D) Unarmed victims, biennial YLL rates per million by race/ethnicity.

cyclist road injuries, 78% of that due to unintentional firearm injuries, 63% of that due meningitis and 57% of that due to maternal death.^{2–9} Further, rates of YLL for Black and Native American populations are 3–4 times that of the White population, while rates of YLL for the Asian population are half that of the White population. Previous work posits structural racism as a driver of Black-White disparities in police violence.¹⁰ However, the disparities in fatal police encounters among Black and Native people compared with White people in our study, contrasted with the protective effect of Asian ethnicity, suggests racism alone does not explain our findings. Our findings suggest the influence of an insidious anti-Black and anti-Indigenous logic to police violence that warrants further exploration into the role of these factors in fatal police encounters.^{11–12} The literature on the ‘twin genocidal’ process of enslavement and land dispossession for Black and Indigenous communities may begin to illuminate the unique but related ways that white supremacy has shaped these groups experiences with policing in North America.¹³ The increased likelihood of police encounters in Black neighbourhoods compared with White neighbourhoods is another likely

influence.¹⁴ Poor jurisdictional dynamics between states and tribal authorities may also be at play.¹⁵

The persistence of Black-White disparities among unarmed Black victims, in particular, suggests police demilitarisation maybe an ameliorating intervention. The US Military offloads surplus weaponry to local police¹⁶ and use of force policies lack specificity and standardisation.¹⁷ Further, only 16 states require de-escalation training, which would equip officers to distinguish a threat from a civilian in crisis.¹⁸ Militarisation hastens the transition from disproportionate policing to disproportionate mortality.^{14–19} Health professionals should help frame police violence against BIPOC as a public health crisis and mobilise policymakers to confront this injustice pursuant to achieving health equity.

What is already known on this subject

- ▶ Previous cross-sectional studies have demonstrated a disproportionate burden of fatal police shootings based among Black and Hispanic victims in the USA.

What this study adds

► This study extends prior work by demonstrating a persistent longitudinal trend of disproportionate victimisation of Black, Hispanic and Indigenous persons in fatal shootings by police in the USA. Further, we demonstrate that this trend persists among Black and Hispanic victims even when unarmed.

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