Police-Related Deaths and Neighborhood Economic and Racial/Ethnic Polarization, United States, 2015–2016

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Objectives. To estimate the association between rates of police-related deaths and neighborhood residential segregation (by income, race/ethnicity, or both combined) in the United States.

Methods. We identified police-related deaths that occurred in the United States (2015–2016) using a data set from the *Guardian* newspaper. We used census data to estimate expected police-related death counts for all US census tracts and to calculate the Index of Concentration at the Extremes as a segregation measure. We used multilevel negative binomial models for the analyses.

Results. Overall, police-related death rates were highest in neighborhoods with the greatest concentrations of low-income residents (vs high-income residents) and residents of color (vs non-Hispanic White residents). For non-Hispanic Blacks, however, the risk was greater in the quintile of neighborhoods with the highest concentration of non-Hispanic White residents than in certain neighborhoods with relatively higher concentrations of residents of color (the third and fourth quintiles).

Conclusions. Neighborhood context matters—beyond individual race/ethnicity—for understanding, preventing, and responding to the occurrence of police-related deaths.

Public Health Implications. Efforts to monitor, prevent, and respond to police-related deaths should consider neighborhood context, including levels of segregation by income and race/ethnicity. (*Am J Public Health.* 2019;109:458–464. doi:10.2105/AJPH.2018.304851)

See also Howard, p. 349.

More than 1100 persons died in the United States in 2015 from injuries inflicted by law enforcement, and police-related mortality rates are disproportionately high among men and boys of color.[1,2] Police-related deaths also have ripple effects that can harm the health of families and communities, which in turn may exacerbate population-level health inequities.[3–5] Better understanding of the ways in which police-related deaths are geographically distributed can inform epidemiological monitoring of health equity, and can help target public health interventions aimed at preventing police violence or responding to its effects on communities.

We aimed to develop a greater understanding of the relationship between neighborhood context and police-related deaths. We used a validated, news media–based data set to provide what is, to our knowledge, the first multilevel, national, census tract–level analysis of police-related death rates. We assessed the degree to which police-related deaths are geographically patterned by polarization, defined as the spatial concentration of privileged and deprived social groups.

Residential segregation in the 21st century is a joint function of race/ethnicity combined with socioeconomic position and is most pronounced at the neighborhood level.[6–8] Processes of segregation result in spatial polarization—the concentration of people belonging to the extreme poles of racial and economic privilege or deprivation into homogeneous neighborhoods.[9]

Our main a priori hypothesis was that greater concentrations of economic and racial/ethnic privilege within neighborhoods would protect against police-related deaths, whereas rates of these deaths would increase with greater concentrations of economic and racial/ethnic deprivation, above and beyond the risk associated with individuals' age, gender, and race/ethnicity. Additionally, in line with prior epidemiological research on the geographic patterning of injury and mortality,[10–13] we hypothesized that neighborhood measures of racialized economic polarization would exhibit stronger associations with police-related death rates compared with measures based solely on income or race/ethnicity. We also sought to determine whether the association between neighborhood polarization and rates of police-related death varied by race/ethnicity.

METHODS

For our cross-sectional study, we obtained data on the 2238 people killed by US police for the period 2015 to 2016 recorded in The Counted, a Web site maintained by the *Guardian* newspaper until the end of 2016 that

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TABLE 1—Deaths From Law Enforcement Reported in *The Guardian*'s The Counted That Were Included and Excluded From Analyses: United States, 2015–2016

Exclusion Criterion	No.
Total cases	2238
Cases excluded	
Domestic violence perpetrated by law enforcement	15
Death in custody[a]	41
Car accident[b]	42
"Friendly fire" (officer accidently killed by another officer)	3
Fatal injury inflicted in prison, jail, or hospital	18
Total excluded	119
Total cases included	2119

[a]We excluded deaths that occurred in law enforcement custody unless they were reportedly ruled a homicide or there was clear evidence of a mechanism of death implicating law enforcement.

[b]We excluded deaths from motor vehicle collisions unless law enforcement officers were pursuing the decedent prior to the collision.

identified the deaths by compiling news media reports.[14] The Counted reported decedents' demographic characteristics, circumstances of death, and locations where the fatal injuries were inflicted. Our prior research estimated that The Counted captured 93% of police-related deaths in 2015 and found that its reported demographic data were highly concordant with those reported on death certificates.[2,15] In our current study, we included only the 2119 deaths resulting from injuries inflicted by law enforcement officers acting in the line of duty that occurred in noninstitutional settings (i.e., the encounter did not take place in jails, prisons, or hospitals). We excluded deaths that occurred while the decedent was in the custody of a law enforcement officer unless the death, as reported by The Counted, was ruled a homicide or there was clear evidence of a mechanism of death implicating law enforcement. We also excluded deaths from motor vehicle collisions unless officers were pursuing the decedent prior to the collision. Table 1 provides specific justifications for the 119 cases that we omitted. We geocoded incident locations using the Google Maps API (application programming interface)[16] and identified corresponding census geographies using the US Census Geocoder API.[17]

Our study encompassed the entire US population and included individuals nested within 3 progressively higher geographic levels: 111 625 census tracts (composing our operational definition of "neighborhood"), nested within 22 765 "cities" (which typically correspond to the jurisdiction of a local police department, and which we defined as legally incorporated cities, towns, townships, village, and boroughs; or the unincorporated areas of a county), nested within the 50 states plus the District of Columbia (Table A, available as a supplement to the online version of this article at http://www.ajph.org).

Census Tract Measures

We used census tract data from the American Community Survey's 5-year estimates to calculate 5 measures of residential economic and racial/ethnic polarization, using the Index of Concentration at the Extremes (ICE), and also obtained data on the proportion of persons below the federal poverty line for comparison. Census tracts, rather than cities, were our primary level of analysis because prior epidemiological literature has identified stronger social gradients for health outcomes at the census tract level,[12] criminal justice research has found police use of force to vary at subcity levels,[18] and census tracts are often coterminous with cities in areas of low population density.

ICE is a measure originally developed by the sociologist Douglas Massey in 2001; he based it on a theory that, when measuring neighborhood effects, extreme concentrations of either privileged or deprived residents and a dearth of those in between matter, not simply the proportion of deprived residents.[19] The measure has more recently been used for epidemiological monitoring of health inequities for various geographic levels.[10–13] Although an area's poverty rate quantifies a neighborhood's proportion of low-income residents, it does not also characterize the proportion of the nonpoor population that is wealthy. By contrast, ICE simultaneously measures the relative concentrations of privileged and deprived residents of an area with the formula:

$$(1) \qquad ICE_i = (A_i - P_i)/T_i$$

where A_i, P_i, and T_i correspond, respectively, to the number of households in the ith geographic area that are categorized as belonging to the most privileged extreme, the most deprived extreme, and the total population whose privilege level was measured. For example, for the ICE for income, A_i = number of high-income households in neighborhood I, P_i = number of low-income households in neighborhood I, and T_i = total number of households in neighborhood i. The ICE accordingly ranges from −1 (100% of the population belongs to the deprived group) to 1 (100% belongs to the privileged group).

Although Massey originally conceptualized privilege and deprivation in terms of income alone, social epidemiologists subsequently adapted ICE to also quantify neighborhood racial/ethnic privilege and deprivation, singly and combined with income segregation.[12,20,21] The use of the new ICE measures was motivated by a lack of residential segregation measures that simultaneously took into account both racial/ethnic and economic segregation and that also could be used meaningfully at the census tract level.[11–13,20,21] Attesting to the importance of addressing racialized economic segregation, robust evidence documents that predominantly non-Hispanic White neighborhoods typically have greater access to employment, education, housing, public safety, and political representation compared with neighborhoods with higher concentrations of PoC (people of color; i.e., people who identify as Hispanic or any race other than White alone), particularly neighborhoods with higher concentrations of non-Hispanic Black residents.[22] Additionally, ICE is better suited for characterizing racial segregation at the neighborhood level than other commonly used metrics such as the Index of Dissimilarity, because the latter is a measure of how evenly a racial group is spatially distributed within an area and is therefore less informative for very small geographic units.[13]

Drawing from prior public health analyses, we used 5 ICE metrics (Table B, available as a supplement to the online version of this article at http://www.ajph.org), with privileged versus deprived groups defined as

1. high- versus low-income households (i.e., top vs bottom quintile of US household incomes in 2015),
2. non-Hispanic White versus non-Hispanic Black persons,

3. non-Hispanic White persons versus PoC,
4. high-income non-Hispanic White versus low-income Black households, and
5. high-income non-Hispanic White versus low-income PoC households.

Because Black–White segregation is the predominant form of segregation in the United States, with consistent evidence of its adverse effects on health, we included ICE measures defining deprived persons solely as non-Hispanic Black residents and, for comparison, also calculated ICE measures that defined all PoC as deprived. We defined high-income households as those earning $125 000 or more a year (top 20th percentile) and low-income households as those earning less than $20 000 a year (bottom quintile).[23] Basing cutpoints on the national distribution for each ICE measure, we grouped the census tracts into quintiles. Similarly, we generated quintiles of census tract poverty based on the proportion of residents below the federal poverty line in the previous year.

Denominators and Expected Counts

Our analyses assumed that the population at risk for police-related deaths in a given census tract was comparable to the residential population of that neighborhood. Following that assumption, we used indirect standardization to calculate expected death counts based on stratum-specific rates (with strata defined by individual race/ethnicity, gender, and age), with denominator data from census tract–level census population estimates (Table C, available as a supplement to the online version of this article at http://www.ajph.org).

Our analytic models incorporated race/ethnicity at 2 levels simultaneously: the individual and the census tract. The expected death count for a census tract is the number of police-related deaths that would have occurred if racial/ethnic differences (and other demographic differences) in the risk of being killed by police were uniform across all neighborhoods. This is a compositional effect: the degree to which variability in neighborhood police-related death rates is reducible to differences in the individual-level risk of its residents. By contrast, the associations estimated for the ICE measures (specifically, the 4 measures based on census tract race/ethnicity) reflect the contextual effect of neighborhood racial/ethnic makeup: the added risk above and beyond the expected count of police-related deaths.

City-Level Control Variables

We included 1 control variable—city population size—with categories based on standard cutoffs used to measure urbanicity, ranging from less than 1000 to 1 million or more.[24]

Analyses

We conducted all analyses using Stata version 15.1 (StataCorp, College Station, TX). We first tabulated police-related death counts by individual and area-based characteristics, then calculated age-adjusted mortality rates stratified by demographic, city, and neighborhood characteristics. These rate calculations used census-based population size estimates as denominators.

We then estimated multilevel negative binomial models for the ratio of observed-to-expected deaths within census tracts. Each model included 1 census tract–level indicator variable (quintiles for 1 of the ICE measures or for percent poverty), controlled for city size, and incorporated random intercepts for cities and states. We first estimated the models for the total population, with expected counts reflecting the racial/ethnic, age, and gender composition of the census tracts. We then conducted stratified analyses by race/ethnicity for the non-Hispanic White, non-Hispanic Black, and Hispanic populations, the largest racial/ethnic groups in the United States and those for which we have previously validated The Counted data.[15] Expected counts in these models reflected the age and gender composition of the racial/ethnic population that was the subject of the subgroup analysis.

RESULTS

For the period 2015 to 2016, the total population age-adjusted rate for police-related deaths in the United States equaled 3.4 per million person-years (95% confidence interval [CI] = 3.2, 3.5; Table 2). Groups defined by individual-level sociodemographic characteristics whose rates exceeded that of the total population included persons aged 15 to 44 years (reaching 7.7 million person-years [95% CI = 7.1, 8.3) for those aged 25 to 34 years), men (6.4; 95% CI = 6.1, 6.7), non-Hispanic Blacks (6.4; 95% CI = 5.9, 7.0), and American Indians/Alaska Natives (6.8; 95% CI = 4.6, 9.1). In terms of city population, the death rate was highest for small cities with fewer than 10 000 residents (4.6; 95% CI = 4.1, 5.2). For census tract characteristics (not controlling for individual demographic characteristics), death rates were lowest in the most privileged census tracts and highest in the most deprived census tract quintiles for ICE(income) (6.2; 95% CI = 5.7, 6.7) and for poverty (5.9; 95% CI = 5.5, 6.3).

In multilevel negative binomial models for the total population, the rates of police-related deaths increased with higher quintiles of census tract deprivation for all 6 measures, independent of census tract demographic composition. Effect sizes were strongest for the ICE measures incorporating income—singly or combined with race/ethnicity—and for poverty; these 4 metrics yielded similar results (Table 3). For these economic census tract measures, a large increase occurred between the first quintile (Q1; most privileged) and second quintile (Q2): rates were approximately twofold higher in Q2 versus Q1 and rose monotonically thereafter. Effect sizes were smaller for the 2 ICE metrics based solely on census tract race/ethnicity, and only the Q5 (greatest non-Hispanic Black or PoC concentration) rates were higher than that of Q1 (greatest non-Hispanic White concentration) at $P < .05$.

In the models stratified by race/ethnicity for non-Hispanic Black, non-Hispanic White, and Hispanic populations, the 3 economic ICE measures and poverty followed the same general pattern as the total population, with concentrated economic privilege predicting lower rates of police-related deaths and with rates increasing where concentrations of deprivation are greater. The main difference between these stratified models occurred for the 2 ICE metrics that measured solely concentrations of racial/ethnic groups. For non-Hispanic Whites, rates of police-related deaths increased in

census tracts with greater concentrations of Black and PoC residents and were approximately twice as high in Q5 compared with Q1 for both measures. This was not the case for non-Hispanic Black and Hispanic persons, for whom there was no clear linear trend. Non-Hispanic Black individuals were at greater risk in the quintile of census tracts with the highest concentration of White residents compared with Q4 for both ICE measures: ICE(White vs Black) and ICE(White vs PoC), and also for Q3 for the latter.

DISCUSSION

Our study provides novel evidence to suggest that understanding, preventing, and responding to police-related deaths requires attention to neighborhood context, not just individual characteristics, and to local economic characteristics, not solely race/ethnicity. In line with our hypothesis, we found that census tract concentrations of economic privilege were associated with lower rates of police-related deaths in the United States for the period 2015 to 2016, whereas greater concentrations of deprivation were associated with higher rates. However, the ICE measures for census tract racialized economic polarization did not exhibit any meaningful differences compared with the ICE measures for census tract income or census tract race/ethnicity alone. Police-related deaths rates were relatively lower among the most economically privileged quintile of census tracts and occurred at approximately half the rate of the second wealthiest quintile, regardless of whether economic privilege was defined solely by income, by income in combination with race/ethnicity, or by poverty. When we defined privilege and deprivation by census tract racial/ethnic concentration without regard to income, a different pattern emerged: only non-Hispanic Whites experienced the lowest risk of police-related deaths in census tracts with the highest concentrations of non-Hispanic White residents. By contrast, for non-Hispanic Blacks, risk of police-related deaths was higher in census tracts with greater concentrations of non-Hispanic Whites compared with some but not all strata of census tracts with higher concentrations of PoC.

TABLE 2—Distributions and Rates of Deaths From Law Enforcement Reported in *The Guardian*'s The Counted, by Characteristics of Individuals and Communities: United States, 2015–2016

Variable	Counts and Proportions		Age-Adjusted Mortality Rate[a] per Million Person-Years (95% CI)
	% of US Population	Deaths, No. (%)	
Total	100.0	2119 (100.0)	3.4 (3.2, 3.5)
Age, y			
Birth–4	6.2	0 (0.0)	0.0 (0.0, 0.0)
5–14	12.7	4 (0.2)	0.0 (0.0, 0.1)
15–24	13.6	367 (17.6)	4.2 (3.8, 4.7)
25–34	13.8	683 (32.4)	7.7 (7.1, 8.3)
35–44	12.6	499 (23.7)	6.2 (5.6, 6.7)
45–54	13.3	333 (15.8)	3.9 (3.5, 4.3)
55–64	12.8	170 (8.1)	2.1 (1.8, 2.4)
65–74	8.7	39 (1.9)	0.7 (0.5, 0.9)
75–84	4.8	13 (0.6)	0.5 (0.2, 0.8)
≥85	2.0	2 (0.1)	0.2 (0.0, 0.6)
Missing	. . .	9 (< 0.1)	. . .
Gender			
Male	49.9	2032 (95.9)	6.4 (6.1, 6.7)
Female	50.1	87 (4.1)	0.3 (0.2, 0.3)
Missing	. . .	0 (0.0)	. . .
Race/ethnicity			
Non-Hispanic White	62.6	1093 (52.5)	2.9 (2.7, 3.1)
Non-Hispanic Black	13.0	545 (26.2)	6.4 (5.9, 7.0)
Hispanic/Latino	17.7	365 (17.5)	3.1 (2.8, 3.4)
Non-Hispanic Asian/Pacific Islander	6.0	42 (2.0)	1.0 (0.7, 1.3)
Non-Hispanic American Indian/Alaska Native	0.8	36 (1.7)	6.8 (4.6, 9.1)
Missing	. . .	38 (1.8)	. . .
City population			
< 10 000	10.9	289 (13.6)	4.6 (4.1, 5.2)
10 000 to < 50 000	25.4	498 (23.5)	3.2 (3.0, 3.5)
50 000 to < 250 000	33.9	642 (30.3)	3.1 (2.8, 3.3)
250 000 to < 1 000 000	19.9	480 (22.7)	3.8 (3.5, 4.2)
≥1 000 000	10.0	210 (9.9)	3.1 (2.7, 3.6)
Missing city	. . .	0 (0.0)	. . .
Neighborhood characteristics			
Missing	. . .	7 (< 0.1)	. . .
% poverty			
Q1 (lowest poverty)	22.7	185 (8.8)	1.3 (1.1, 1.5)
Q2	19.6	323 (15.3)	2.7 (2.4, 3.0)
Q3	18.6	354 (16.8)	3.1 (2.8, 3.4)
Q4	18.7	494 (23.4)	4.2 (3.8, 4.6)
Q5 (highest poverty)	20.4	753 (35.7)	5.9 (5.5, 6.3)

Continued

TABLE 2—*Continued*

Variable	Counts and Proportions: % of US Population	Counts and Proportions: Deaths, No. (%)	Age-Adjusted Mortality Rate[a] per Million Person-Years (95% CI)
ICE (high vs low income)			
Q1 (most privileged)	18.5	208 (9.9)	1.4 (1.2, 1.6)
Q2	17.8	354 (16.8)	2.7 (2.4, 3.0)
Q3	18.2	363 (17.2)	3.2 (2.9, 3.6)
Q4	20.8	482 (22.9)	4.4 (4.0, 4.7)
Q5 (least privileged)	24.7	702 (33.3)	6.2 (5.7, 6.7)
ICE (White vs Black)			
Q1 (most privileged)	23.8	192 (9.1)	2.3 (1.9, 2.6)
Q2	22.8	286 (13.6)	2.7 (2.4, 3.0)
Q3	21.1	385 (18.3)	3.0 (2.7, 3.3)
Q4	18.5	522 (24.7)	3.5 (3.2, 3.9)
Q5 (least privileged)	14.0	725 (34.4)	4.7 (4.3, 5.0)
ICE (White vs PoC)			
Q1 (most privileged)	24.9	189 (9.0)	2.3 (1.9, 2.6)
Q2	22.1	295 (14.0)	2.7 (2.4, 3.1)
Q3	20.6	367 (17.4)	2.9 (2.6, 3.2)
Q4	18.4	498 (23.6)	3.5 (3.2, 3.8)
Q5 (least privileged)	14.1	761 (36.1)	4.7 (4.3, 5.0)
ICE (high-income White vs low-income Black)			
Q1 (most privileged)	20.6	181 (8.6)	1.3 (1.1, 1.5)
Q2	19.8	322 (15.3)	2.8 (2.5, 3.1)
Q3	17.1	363 (17.2)	3.5 (3.1, 3.8)
Q4	19.1	572 (27.1)	4.6 (4.2, 5.0)
Q5 (least privileged)	23.4	671 (31.8)	5.1 (4.7, 5.5)
ICE (high-income White vs low-income PoC)			
Q1 (most privileged)	20.6	174 (8.3)	1.3 (1.1, 1.5)
Q2	19.8	306 (14.5)	2.7 (2.4, 3.0)
Q3	17.1	330 (15.7)	3.2 (2.9, 3.6)
Q4	19.1	528 (25.0)	4.2 (3.8, 4.6)
Q5 (least privileged)	23.4	771 (36.6)	5.5 (5.1, 5.9)

Note. CI = confidence interval; ICE = Index of Concentration at the Extremes; PoC = people of color; Q = quintile.

[a]Age-specific rates are not age adjusted. All other rates are adjusted to the 2000 standard population. Numerators include complete cases only.

Study Strengths and Limitations

Our study is strengthened by its use of a data set on police-related deaths that—unlike official sources that document fewer than half of these fatalities—is recognized to capture nearly 95% of such incidents.[15] Additionally, our analyses incorporated cities as geographic units that most closely correspond to local police jurisdictions. One limitation of our study is a lack of data on the demographic composition of dynamic census tract populations (i.e., the persons who spend time in a given census tract and are therefore at risk for police-related death, but are not reflected in the census data from which we derived rates). However, research suggests that persons who spend time in a neighborhood are demographically similar to its residents.[25] Another limitation is the absence of control variables pertaining to city-level law enforcement and political characteristics (e.g., police use of force policies and their implementation); such data are collected for only a subset of law enforcement agencies and are not uniformly available across the entire United States.[26] Additionally, we were not able to stratify analyses by gender because of the small number of women decedents (n = 87). Finally, we did not have census tract–level data on interpersonal violence, so we were not able to assess the ways in which violence between civilians might mediate the relationship between neighborhood deprivation and police-related deaths.

Interpretation

Previous national-level studies of lethal force by US police have found wide geographic variation by county; our research found that rates of police-related deaths also vary by census tract, and that this variation is partly explained by social polarization. In terms of economic ICE measures and poverty, police-related deaths follow the same social gradient observed for a variety of other health outcomes where the burden is greatest in neighborhoods of concentrated deprivation and diminishes in neighborhoods of concentrated privilege. Our finding that this relationship does not hold among non-Hispanic Blacks contrasts with epidemiological multilevel studies of other health outcomes,[27] including for interpersonal violence,[12,28] that have identified associations whereby greater racial segregation predicts a higher risk of poor health. Future research may explore the mechanisms behind the association between polarization and police-related deaths and seek to explain why the relationship between polarization and police-related death rates may vary by racial/ethnic group.

Public Health Implications

Public health has various roles to play in monitoring, preventing, and responding to police-related deaths. Our results suggest that to determine appropriate responses, health departments and other organizations concerned with health equity should consider monitoring differences in rates of police-related deaths and making comparisons by racial/ethnic group and by level of neighborhood polarization. Additionally, interventions such as crisis intervention teams (designed to prevent police-related deaths by incorporating mental health professionals in police response),[29]

TABLE 3—Results of Negative Binomial Regression Models for the Ratio of Observed-to-Expected Police-Related Deaths by Census Tract ICE Measure and Poverty: United States, 2015–2016

	Racial/Ethnic Group(s) Included in Model, IRR (95% CI)			
Census Tract Measure	All	Non-Hispanic White	Non-Hispanic Black	Hispanic
Poverty				
Q1 (Ref)	1	1	1	1
Q2	1.78 (1.48, 2.14)	1.81 (1.45, 2.26)	1.73 (1.05, 2.85)	1.72 (1.01, 2.91)
Q3	1.88 (1.56, 2.26)	1.94 (1.56, 2.43)	1.78 (1.1, 2.89)	1.47 (0.87, 2.47)
Q4	2.36 (1.98, 2.82)	2.64 (2.12, 3.28)	2.31 (1.47, 3.64)	1.67 (1.02, 2.74)
Q5	3.03 (2.56, 3.60)	3.49 (2.8,0 4.34)	3.46 (2.25, 5.33)	2.17 (1.36, 3.48)
ICE (high vs low income)				
Q1 (Ref)	1	1	1	1
Q2	1.82 (1.52, 2.17)	1.85 (1.48, 2.31)	1.92 (1.23, 3.02)	1.27 (0.84, 1.94)
Q3	2.05 (1.72, 2.46)	2.26 (1.81, 2.83)	1.96 (1.25, 3.08)	1.24 (0.81, 1.90)
Q4	2.55 (2.14, 3.03)	2.94 (2.36, 3.67)	2.45 (1.60, 3.76)	1.50 (1.00, 2.24)
Q5	3.36 (2.85, 3.97)	4.10 (3.28, 5.12)	3.59 (2.40, 5.37)	1.95 (1.32, 2.86)
ICE (White vs Black)				
Q1 (Ref)	1	1	1	1
Q2	1.02 (0.84, 1.25)	1.01 (0.82, 1.25)	0.61 (0.26, 1.46)	1.17 (0.40, 3.44)
Q3	1.04 (0.85, 1.26)	1.15 (0.93, 1.43)	0.52 (0.23, 1.16)	0.49 (0.17, 1.46)
Q4	1.11 (0.91, 1.35)	1.37 (1.09, 1.72)	0.43 (0.20, 0.94)	0.71 (0.25, 2.02)
Q5	1.35 (1.11, 1.64)	1.96 (1.51, 2.54)	0.53 (0.25, 1.15)	0.74 (0.26, 2.12)
ICE (White vs PoC)				
Q1 (Ref)	1	1	1	1
Q2	1.10 (0.91, 1.34)	1.14 (0.93, 1.41)	0.48 (0.23, 1.03)	0.96 (0.32, 2.90)
Q3	1.05 (0.86, 1.28)	1.17 (0.94, 1.45)	0.47 (0.24, 0.92)	0.47 (0.16, 1.40)
Q4	1.12 (0.92, 1.36)	1.42 (1.13, 1.79)	0.40 (0.21, 0.78)	0.66 (0.23, 1.89)
Q5	1.40 (1.15, 1.71)	2.21 (1.69, 2.88)	0.53 (0.27, 1.02)	0.64 (0.22, 1.84)
ICE (high-income White vs low-income Black)				
Q1 (Ref)	1	1	1	1
Q2	1.91 (1.58, 2.30)	1.95 (1.56, 2.44)	2.18 (1.27, 3.76)	1.24 (0.74, 2.06)
Q3	2.23 (1.85, 2.69)	2.44 (1.96, 3.05)	2.17 (1.26, 3.73)	1.31 (0.80, 2.15)
Q4	2.72 (2.28, 3.24)	3.37 (2.72, 4.17)	2.07 (1.23, 3.48)	1.65 (1.06, 2.56)
Q5	2.81 (2.36, 3.35)	3.54 (2.79, 4.48)	2.67 (1.66, 4.29)	1.45 (0.92, 2.28)
ICE (high-income White vs low-income PoC)				
Q1 (Ref)	1	1	1	1
Q2	1.95 (1.61, 2.36)	2.14 (1.71, 2.68)	1.74 (1.01, 2.98)	0.79 (0.43, 1.47)
Q3	2.13 (1.76, 2.58)	2.37 (1.89, 2.97)	1.44 (0.83, 2.50)	1.53 (0.91, 2.59)
Q4	2.54 (2.12, 3.04)	3.13 (2.52, 3.88)	1.89 (1.17, 3.05)	1.32 (0.82, 2.13)
Q5	2.99 (2.51, 3.56)	4.17 (3.30, 5.29)	2.47 (1.57, 3.88)	1.63 (1.04, 2.56)

Note. CI = confidence interval; ICE = Index of Concentration at the Extremes; IRR = incidence rate ratio; PoC = people of color; Q = quintile. Models included random intercepts for city and state, and controlled for city population size.

programs aimed at preventing interpersonal violence using public health models,[30] and counseling services specifically intended for family members of those killed by police[31] may be made more effective by considering neighborhood polarization in their efforts. AJPH

CONTRIBUTORS

J. M. Feldman conceptualized the study, conducted the analyses, and wrote the manuscript. S. Gruskin, B. A. Coull, and N. Krieger conceptualized the study and provided feedback on the manuscript.

CONFLICTS OF INTEREST

The authors have no conflicts of interest to declare.

HUMAN PARTICIPANT PROTECTION

Institutional review board approval was not needed for this study because the data were obtained from secondary, publicly available sources.

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