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## Police killings of black people and rates of sexually transmitted infections: a cross-sectional analysis of 75 large US metropolitan areas, 2016.

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### Abstract

**Objectives:** Emerging literature shows that racialized police brutality, a form of structural racism, significantly affects health and well-being of racial/ethnic minorities in the USA. While public health research suggests that structural racism is a distal determinant of sexually transmitted infections (STIs) among Black people, no studies have empirically linked police violence to STIs. To address this gap, our study measures associations between police killings and rates of STIs among Black residents of US Metropolitan Statistical Areas (MSAs).

**Methods:** This cross-sectional ecologic analysis assessed associations between the number of Black people killed by police in 2015 and rates of primary and secondary syphilis, gonorrhea, and chlamydia per 100,000 Black residents of all ages in 2016 in 75 large MSAs. Multivariable models controlled for MSA-level demographic and socioeconomic characteristics, police expenditures, violent crime, arrest and incarceration rates, insurance rates and health care funding.

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**Results:** In 2015, the median number of Black people killed by police per MSA was 1.0. In multivariable models, police killings were positively and significantly associated with syphilis and gonorrhea rates among Black residents. Each additional police killing in 2015 was associated with syphilis rates that were 7.5% higher and gonorrhea rates that were 4.0% higher in 2016.

**Conclusions:** Police killings of Black people may increase MSA-level risk of STI infections among Black residents. If future longitudinal analyses support these findings, efforts to reduce STIs among Black people should include reducing police brutality and addressing mechanisms linking this violence to STIs.

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## INTRODUCTION

In 2018, the American Public Health Association recognized police brutality as a public health issue that disproportionately affected the health of racial/ethnic minorities and other marginalized populations.<sup>1</sup> A growing line of research suggests that racialized police brutality, a form of structural racism, has many adverse consequences for the public's health,<sup>2</sup> both among its immediate targets and also among witnesses and the broader communities in which these targets and witnesses live. For instance, Bor et al. found that the number of police killings of Black men in a state was associated with more poor mental health days among Black adults living in that state.<sup>3</sup> The same study found no association between police killings of Black people and White residents' mental health. This is one more argument supporting the racialized nature of police brutality's effects on public health.

The present analysis investigates whether police killings of Black people in a metropolitan statistical area (MSA) are associated with rates of sexually transmitted infections (STIs) among Black adults and adolescents living in that MSA. We chose to focus on this outcome because of the high and rising burden of STIs among Black people,<sup>4</sup> demonstrated link between structural racism and STIs,<sup>5</sup> and because multiple plausible pathways may link police killings to STI transmission in this population. For example, studies of non-police related violence suggest<sup>6</sup> that psychological distress may lead to risky sexual practices. This analysis was guided by the HIV Ecology Model,<sup>7</sup> which posits that racism and other distal processes shape sexual networks and behaviors, and the Minority Stress Model,<sup>8</sup> which links the oppression of minority groups by a dominant majority to stress that adversely affects minority health.

## Methods

This analysis is part of a larger cohort study of large US MSAs with populations >500,000 in 1990 (N=96). Complete data were available for 75 of 96 MSAs that met this criterion (data for crime and arrest covariates were missing for 21 MSAs).

## Measures

**Outcome.**—The Centers for Disease Control and Prevention (CDC) provided data on the rates of newly diagnosed cases of (1) primary and secondary syphilis, (2) gonorrhea, and (3) chlamydia among non-Hispanic Black residents per 100,000 Black residents of each MSA in 2016. See Supplemental Table S1 for details.

**Primary exposure.**—Data on the number of non-Hispanic Black people killed by police in 2015 were culled from *The Guardian's The Counted* database. This newspaper collected these data from police reports, witness statements, media coverage, research accounts, and open-source projects reporting police killings. Because we conceptualized police killings as major events, like terrorist attacks, consistent with past research on police killings<sup>3</sup> we operationalized the exposure as a count. Since the purpose of our analysis is to explore the effect of racialized police killings as part of structural racism, we focus on police killings of Black people only. We evaluated killings occurred in 2015, one year before the outcome, because we anticipated that the exposure's effects might not be instantaneous.

**Confounders.**—We included variables capturing MSA sociodemographic composition, war on drugs-related criminal justice implementation, economic characteristics, health insurance rates, and government expenditures that might confound the relationship between fatal police encounters and STIs (see Supplemental Table S1 for the list of covariates and details on data sources).

## Analysis

Measures of central tendency and dispersion described variable distributions. We natural-log transformed the number of fatal police encounters (for all models) and syphilis rates to linearize relationships (gonorrhea and chlamydia rates were not log transformed; see Supplemental Table S4 for description of coefficient back transformation). To build each multivariable model (one for each STI outcome), we first identified variables that might confound the police killings/STI relationship by adding one putative confounder at a time to a bivariate model containing the police killings variable and the outcome; variables that altered the magnitude of this focal relationship by >10% were included in the preliminary multivariable model.<sup>9</sup> We removed potential confounders from the preliminary multivariable model that were collinear, as determined by condition index and variance proportion multicollinearity diagnostics. Our cohort is a census of large US MSAs, not a sample, and so p-values hold little meaning. Instead of using  $p < 0.05$  to determine statistical significance, we defined *substantive* significance as the magnitude of the standardized coefficient  $|0.1|$ .<sup>10</sup> All models included a state covariate to account for attributes of states that may impact our outcome. To aid interpretation, we calculated the difference in the median STI rates corresponding to one unit difference in the number of killings (see Supplemental Table S4 for details).

## RESULTS

The median number of fatal encounters with police among Black people in these MSAs in 2015 was 1.0 (25<sup>th</sup> percentile: 0.0, 75<sup>th</sup> percentile: 3.0; see Supplemental Table S2 for descriptive statistics).

### Syphilis.

In the multivariable model, the magnitude of the relationship between the log of fatal encounters and the logged syphilis rates was  $b = 0.17$  (standardized  $B > 0.1$ ; Table 1),

indicating that MSAs that had 1 more police killing of a Black person in 2015 had a 7.5% higher rate of syphilis among Black residents in 2016 (Supplemental Table S4).

### **Gonorrhea.**

In the multivariable model, the magnitude of the relationship between log of fatal encounters and the gonorrhea rate was  $b=39.36$  (standardized  $B>0.1$ ; Table 1), suggesting that MSAs with 1 more police killing of a Black person in 2015 had a 4.0% higher rate of gonorrhea among Black residents in 2016 (Table S4). This relationship only emerged after controls were included (bivariate relationship:  $B=-0.08$ ; Table 1).

### **Chlamydia.**

In the multivariable model, there was no substantively significant relationship between police killings and chlamydia rates ( $B=0.02$ ).

## **DISCUSSION**

Our exploratory multivariable analyses indicate that the number of police killings of Black residents of an MSA is positively associated with the annual rates of syphilis and gonorrhea among Black residents of that MSA. Our results align with the HIV Ecology Model, Minority Stress Model, conceptual work on the adverse impacts of structural racism and police brutality on health,<sup>2</sup> and empirical studies linking structural racism to STIs among Black people.<sup>5</sup> Police killings may increase STI rates through multiple mechanisms. They may elevate psychological stress and trauma, which in turn may generate riskier sexual practices. Police killings may also reinforce Black people's distrust of institutions and fear of racist encounters at or on the way to healthcare providers, which may limit their access to services and generate higher background STI prevalence in sexual networks.

Findings should be interpreted with caution. The study's ecological and cross-sectional design do not support causal inference. Our findings have limited generalizability to smaller MSAs or non-urban areas. Though we analyzed the most accurate nationwide data on the focal exposure and outcomes, these measures were still limited. The relationships found here may vary by individual characteristics (e.g., age, gender, social class, sexual orientation), but we were unable to explore these possibilities because the CDC would not release STI data by MSA, year, and more than one demographic characteristic. Potential underreporting of police Black killings and STIs might have biased findings. Excluding 21 MSAs due to missing crime and arrest data might have attenuated the strength of the focal associations: these MSAs had 50% higher median number of police killings and higher median STI rates (33% for syphilis, 45% for gonorrhea, and 21% for chlamydia) than MSAs included to the analysis. Due to the large number of covariates the models are specific to our data and have limited generalizability to other MSAs.

## **CONCLUSIONS**

This cross-sectional ecologic study is a first step in investigating the possible impacts of police brutality on STIs. More conclusive studies would be possible with longitudinal data on various types of police brutality, and individual-level data on STI status, age, gender,

sexual orientation, and social class. Further studies should assess mechanisms linking police brutality to STIs. Advancing research on the adverse health impacts of police brutality can support advocacy efforts by public health professionals and civil rights activists to reduce police brutality – both an important social justice issue and, as emerging evidence testifies, a powerful structural determinant of health.

## Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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**Key messages**

- Literature shows that police brutality affects health of racial/ethnic minorities in the USA; however, no studies linked police killings and STI rates among Black people.
- In 2015, the median number of Black people killed by police per MSA was 1.0.
- MSAs with higher number of Black people killed by police in 2015 had higher rates of syphilis and gonorrhoea among Black people in 2016.

**Table 1.**

Results of Bivariate and Multivariate Analyses Regressing Rates of Sexually Transmitted Infections Among Black People (per 100,000) on Logged no. Black People Killed by Police in 75 Large MSAs – 2016<sup>a</sup>

Models by outcome	Bivariate		Multivariable <sup>d</sup>	
	Standardized B (CI)	Unstandardized B (CI)	Standardized B (CI)	Unstandardized B (CI)
Logged syphilis rate <sup>b</sup>	0.07 (-0.25, 0.39)	0.17* (-0.31, 0.65)	0.14* (-0.41, 0.70)	0.17* (-0.31, 0.65)
Gonorrhea rate	-0.08 (-0.37, 0.21)	39.36* (-85.6, 164.3)	0.14* (-0.30, 0.57)	39.36* (-85.6, 164.3)
Chlamydia rate	-0.16* (-0.42, 0.10)	13.06 (-210.0, 237.0)	0.02 (-0.4, 0.45)	13.06 (-210.0, 237.0)

<sup>a</sup>The outcome is 2016 STI data. We lagged covariates 1–2 years because we did not expect an instantaneous effect on the outcome.

<sup>b</sup>Variable's distribution was skewed and natural log transformed to approximately conform to the normal distribution.

<sup>c</sup>Variable natural log transformed to linearize its relationship with the outcome.

<sup>d</sup>Multivariable models controlled for MSA-level covariates selected at bivariate stage among demographic (total and Black population size, population density, % of population aged 15–29, Black adults sex ratio, Black isolation index, % female-headed households), socioeconomic (Gini index, affordable housing: Black population status and Black/White disparity in employment, poverty and educational attainment), criminal justice and policing (police per 1,000 population, hard drug arrest rate, violent crime rate, police expenditures per capita, % incarcerated), and access to services (insurance rate, Government expenditures on health and on housing and community development) domains. See supplemental Table S3 for the list of covariates selected for each model and their bivariate and multivariable model parameters.

Note: Bivariate and multivariable models include state covariate.

\* Significant at the a priori level. Confounders proceeded to the next stage of analysis, the multivariate model, if they changed the no. Black people killed by police/STI relationship by > 10% in bivariate models. In the multivariate model, the criteria for substantive significance was a standardized coefficient 0.10.