

Neighbourhood-level policing as a racialised gendered stressor: multilevel analysis of police stops and preterm birth in Seattle, Washington

Taylor Riley ¹, Jaquelyn L Jahn,^{2,3} Mienah Z Sharif,^{1,4} Daniel A Enquobahrie,^{1,5} Anjum Hajat¹

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¹Department of Epidemiology, University of Washington, Seattle, Washington, USA

²Department of Epidemiology and Biostatistics, Drexel University, Philadelphia, Pennsylvania, USA

³Ubuntu Center on Racism, Global Movements, and Population Health Equity, Drexel University, Philadelphia, Pennsylvania, USA

⁴Center for the Study of Racism, Social Justice and Health, UCLA, Los Angeles, California, USA

⁵Department of Health Systems and Population Health, University of Washington, Seattle, Washington, USA

Correspondence to

Dr. Taylor Riley, Department of Epidemiology, University of Washington, Seattle, WA 98195, USA; triley@uw.edu

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ABSTRACT

Background Most studies capturing the health effects of police violence focus on directly impacted individuals, but a burgeoning field of study is capturing the indirect, community-level health effects of policing. Few empirical studies have examined neighbourhood-level policing, a contextual and racialised gendered stressor, in relation to preterm birth risk among Black and other racially minoritised people.

Methods We spatially linked individual birth records (2017–2019) in Seattle, Washington (n=25 909) with geocoded data on police stops for three exposure windows: year before pregnancy, first and second trimester. We fit race-stratified multilevel modified Poisson regression models predicting preterm birth (<37 gestational weeks) across tertiles of neighbourhood stop rates controlling for individual and neighbourhood-level covariates. For the second trimester exposure window, birth was operationalised as a time-to-event outcome using multilevel Cox proportional hazard models.

Results Neighbourhood stop rates of Black residents was higher compared with White residents, and Black and Asian pregnant people were exposed to the highest median neighbourhood-level stop rates. Black birthing people living in neighbourhoods with more frequent police stops had increased risk of preterm birth across all exposure windows including the year before pregnancy (adjusted risk ratio (aRR): 1.38, 95% CI 1.02 to 1.85), first trimester (aRR: 1.74, 95% CI 1.17 to 2.57) and second trimester (aHR: 1.66, 95% CI 1.14 to 2.42). We found null or inverse associations among Asian, Hispanic and White people.

Conclusion Our study adds to the growing evidence documenting associations of higher risk of preterm birth with neighbourhood police stops among Black birthing people. These findings suggest that routine police practices are one aspect of structural racism contributing to racialised perinatal health inequities.

INTRODUCTION

A growing body of research suggests that policing, which is one manifestation of structural racism, can (re)produce racialised health inequities.^{1–4} In addition to well-documented health consequences of directly experiencing police violence, there is growing empirical evidence of police violence as an ecological/vicarious exposure that has ‘spillover’ health impacts within communities.^{2,4} Black individuals residing in areas with greater fatal police violence have higher risks of preterm birth,⁵ poor

WHAT IS ALREADY KNOWN ON THIS TOPIC

⇒ Police violence is increasingly recognised as a community-level stressor that harms community health and produces health inequities, but few empirical studies have examined the perinatal health impacts of the more frequent and everyday low-level police stops that characterise the predominant law enforcement strategy in the USA.

WHAT THIS STUDY ADDS

⇒ Black birthing people living in neighbourhoods with more frequent police stops occurring before and during pregnancy experienced increased preterm birth risk.

HOW THIS STUDY MIGHT AFFECT RESEARCH, PRACTICE OR POLICY

⇒ The persistent racialised inequities in perinatal health demand that public health research and practice address the ways that multiple forms of structural racism, including routine racialised police practices, contribute to these inequities in the USA.

mental health,⁶ hypertension and diabetes,⁷ sexually transmitted infections⁸ and declines in emergency department visits.⁹ However, less is known about the health consequences across racialised groups of the frequent and quotidian low-level police stops that characterise the predominant law enforcement strategy in the USA. Order maintenance policing is characterised by persistent patrolling and surveillance to manage minor offences and disorder, often leading to officers stopping/searching individuals deemed suspicious.¹⁰ Police surveillance and frisking can be intrusive and involve force and intimidation.¹¹ This practice is widespread and disproportionately concentrated in communities of colour, particularly majority Black neighbourhoods, even after accounting for population-specific crime rates.^{3 12–14}

Evidence suggests that living in a neighbourhood with heightened community surveillance produces fear and hypervigilance of police contact and unfair treatment.^{15–17} Regardless of personal encounters with police, individuals can experience stress from living in neighbourhoods with frequent police stops, which is linked to depression, anxiety and reduced

healthcare utilisation.^{15–20} Given the higher rates of police interactions that end in brutality and death for Black, Latino/x and Indigenous people,^{2, 21, 22} these effects are heightened for people in those racialised groups. Thus, addressing policing—including surveillance, criminalisation and arrests—is a critical public health issue.¹

There is also a gendered dynamic of neighbourhood policing as a racialised stressor.²³ Systems of oppression, like structural racism and sexism, intersect to shape inequitable exposure to police and subsequent health consequences.^{2, 23} Black mothers in particular report anticipatory stress about their family being harmed by police violence,^{19, 24} resulting in depression and anxiety.^{25, 26} Higher neighbourhood-level police contact and violence are associated with increased adverse birth outcomes and maternal depressive symptoms among Black women.^{27–30} While these studies have looked at the associations between neighbourhood policing and preterm birth, policy-relevant research gaps remain regarding the timing and type of exposure across racialised groups. Specifically, identifying sensitive periods in pregnancy for specific kinds of police surveillance (eg, total stops, stops involving frisks, etc) would bolster mechanistic evidence of causality and amplify calls from residents and social movements for an end to inequitable police surveillance and criminalisation.²

When conceptualising neighbourhood policing as a racialised gendered stressor, preterm birth is a fitting outcome to examine because it presents an important pathway of the intergenerational harms of stressful community-level exposures. Preterm birth is a leading cause of perinatal morbidity and mortality and racialised inequities in preterm birth are persistent.³¹ Pregnancy is a gendered process and a sensitive life course period,³² but little is known about the health impacts of ecological stressors like policing during different exposure windows before and during pregnancy.

This study aims to examine whether individuals living in neighbourhoods with more frequent police stops were at increased risk of preterm birth in Seattle, Washington. We conceptualise policing as a tool of white supremacy, an enduring system of exploitation and oppression of Black, Indigenous and other people of colour that sustains White political and economic domination.^{33, 34} Policing in the USA is historically rooted in slavery, anti-Black racism and continued maintenance of racialised economic hierarchies.^{35, 36} In Seattle, police have played key roles in outlawing Indigenous people during the city's colonial founding,³⁷ forced removal of Chinese immigrants, Japanese internment,³⁸ enforcement of residential segregation and the War on Drugs that targeted Black residents,^{39, 40} and collaboration with federal immigration enforcement targeting Latino communities.⁴¹ Today, the Seattle Police Department (SPD) stops Black and Indigenous people at five and nine times the rate of White people, respectively.⁴² Given these localised histories, we aim to examine the health consequences of this disproportionate police exposure among women of colour. We hypothesise that living in more frequently surveilled neighbourhoods is associated with increased preterm birth, particularly among Black pregnant people, due to elevated stress about themselves or family members being unnecessarily criminalised.^{3, 7, 15}

METHODS

Data and study population

We conducted a multilevel study with publicly available data from SPD, restricted-use birth certificate data (2017–2019) from the Washington state Department of Health (WDOH), and

data from the American Community Survey (ACS). We included all live singleton births with gestational ages 22–44 weeks ($n=25\,909$). Neighbourhoods were defined by zip code ($n=29$) since this is the smallest geographic level provided in vital statistics and we included all zip codes within SPD's jurisdiction.

Exposure measures

We operationalised neighbourhood policing using geocoded data from SPD that captures the time, date and type of stop (ie, initiated by police or a 911 call); use of frisk (ie, physical pat-down of outer clothing); officer-perceived race of subject; and blurred geographical coordinates (which maintains confidentiality by blurring coordinates within 50 m of stop) from 2015 to 2019. SPD officers are required by departmental policy to record all police–civilian contacts that involve the stop and limited detention of an individual (eg, *Terry* stop), which are then compiled on a daily basis in an SPD database.⁴³ Stops with missing geographical coordinates (4%) were excluded. We examined (1) overall stops, (2) police-initiated stops, defined as stops based on officer discretion rather than citizen request and (3) stops that involved a frisk. The police-initiated and frisk-involved stops capture invasive surveillance and involuntary police contact common to aggressive policing. In a secondary analysis, we examined the association between preterm birth and racially concordant stops, where the birthing person and the person stopped in their neighbourhood were of the same race, among Black and White birthing people.

We calculated temporal-and-geographical specific policing rates for each birth for three exposure windows: year before pregnancy, first trimester and second trimester. We estimated date of conception by subtracting gestational age (weeks) from the 15th day of the birth month because exact day of birth was not provided, as has been done previously.⁴⁴ For each birth, we then calculated the end and start dates of the specific trimesters (first trimester: 1–13 weeks, second trimester: 14–27 weeks) and the year before pregnancy. Within each exposure window, we spatially merged the number of each type of stop that occurred during that time period in their neighbourhood. To account for increased stops due to a larger neighbourhood population, we calculated per-capita stop rates per time period in each zip code using annual zip code-population denominator data from ACS 5-year estimates. We assumed annual population numbers remained stable throughout the year. To account for exposure windows that spanned different years, we calculated time-weighted denominators (eg, if the prepregnancy year was from September 2016 to September 2017, we calculated weighted population number as $3/12$ months * 2016 population + $9/12$ months * 2017 population). We categorised all stop rates into tertiles based on each rate's overall distribution to reduce bias from influential outliers and to avoid assumptions of linearity.

Outcome

The outcome of interest was a binary indicator of preterm birth (<37 gestational weeks). Gestational age was determined based on the physician's clinical estimate at time of delivery, as recommended by WDOH.

Other covariates

Individual-level variables from the birth records include age (years), birth parent self-reported race and ethnicity (non-Hispanic (NH) American Indian/Alaskan Native, NH Asian, NH Black, Hispanic/Latina/e, NH multiracial and NH White), education (high school or less), marital status (currently married

vs not), infant sex and whether Medicaid was the primary payer of the birth. To address differential neighbourhood-level drivers of preterm birth and policing, we calculated the index of concentration at the extremes (ICE) which assesses spatial concentrations of racial and economic privilege and disadvantage within a given area.⁴⁵ We calculated ICE for each neighbourhood i as $(A_i - P_i)/T_i$, where A_i represents the number of NH White and affluent people (80th income percentile), P_i the number of Black and low-income people (20th income percentile) and T_i is the total population in neighbourhood i . This measure is scaled -1 to 1 indicating racial/economic deprivation and privilege, respectively, which we then categorised into quintiles. We used Seattle-specific income thresholds rather than the US average to better account for city-specific differentials in income and cost of living.⁴⁶ We chose this comprehensive indicator because it avoids the common multicollinearity issues associated with using separate measures of advantage/deprivation (eg, poverty, racial composition, etc). We also included per capita rates of violent crime (homicide and aggravated assault) in each zip code over the study period from SPD. Violent crime was conceptualised as a confounder because it is associated with preterm birth, precedes police stops and is likely not on the causal pathway from police stops to preterm birth.

Analysis

We first conducted a descriptive analysis of individual and neighbourhood-level characteristics and rates of police stops across preterm and term births. For the prepregnancy and first trimester exposure windows, we fit multilevel modified Poisson models with random intercepts for zip code to account for spatial clustering by neighbourhood and robust SEs to estimate risk ratios and 95% CI for preterm birth in relation to our measures of neighbourhood-level policing rates. For the second trimester exposure window, we used a time-to-event framework because of varying potential lengths of exposure and immortal time bias.⁵ We conducted multilevel Cox proportional hazards regression models with gestational week as the temporal unit and SEs adjusted to account for clustering by zip code to estimate hazard ratios (HR) and CI. Survival time was defined as the duration from first day of the second trimester to date of birth. Models were adjusted for age, marital status, education, nativity, Medicaid status, previous preterm birth, infant sex, season of birth (December–February; March–May; June–August; September–November), and neighbourhood-level ICE and violent crime. We stratified models by birthing person's race and ethnicity that accounted for at least 10% of the sample to ensure adequate sample sizes for analyses.

Analyses were conducted in R V.4.3.0 and Stata V.16.1. University of Washington's Institutional Review Board deemed this study non-human subjects research.

RESULTS

There were 25 909 births (average of 893 births per zip code) in Seattle from 2017 to 2019, of which 1544 (6%) were preterm (table 1). The prevalence of preterm birth was higher for all racially minoritised people compared with White people (5%), the highest of which was among Indigenous (9%), Latina/e (8%), Black (6%) and Asian (6%) individuals (online supplemental table 1). Those who had a preterm birth were more likely to have a high school education or less, use Medicaid and have a prior preterm birth compared with those with term births.

Black residents were stopped at higher rates than White residents (median rate of 328 compared with 62 stops per 10 000

people in the year before pregnancy, respectively). Black and Asian pregnant people were exposed to the highest median rates of police stops in their neighbourhoods across all exposure periods.

We found no significant associations among total births but did find increased risk of preterm birth among Black birthing people residing in neighbourhoods with higher levels of overall police stops after accounting for individual risk factors and neighbourhood-level racialised economic segregation and violent crime (table 2). In the year before pregnancy, Black birthing people living in neighbourhoods with medium-level overall police stops had a 38% increased risk of preterm birth (adjusted risk ratio (aRR): 1.38, 95% CI 1.02 to 1.85) compared with their counterparts in neighbourhoods with the lowest stop rates. This association was stronger when the exposure was the highest level of stops in the first (aRR: 1.74, 95% CI 1.17 to 2.57) and second trimester (aHR: 1.66, 95% CI 1.14 to 2.42).

When examining police-initiated and frisk-involved stops, we observed similar patterns of elevated risk only among Black birthing people in the second trimester. The hazard of preterm birth was higher among Black birthing people living in neighbourhoods with the highest police-initiated stop rates (aHR: 1.54, 95% CI 1.01 to 2.36) and frisk-involved stop rates (aHR: 1.55, 95% CI 1.01 to 2.4) compared with the lowest.

Conversely, we found that increasing exposure to neighbourhood-level policing was associated with decreased preterm birth risk among Latina/e people. Latina/e birthing people living in neighbourhoods with higher overall police stop rates had reduced risk of preterm birth compared with those living in neighbourhoods with the lowest stop rates during the first (aRR, medium: 0.78, 95% CI 0.64 to 0.96; high: 0.64, 95% CI 0.49 to 0.84) and second trimester (aHR, high: 0.60, 95% CI 0.44 to 0.82), adjusting for covariates. This held true for police-initiated stops in the year before pregnancy and second trimester. We found no evidence of differential preterm birth risk across gradients of neighbourhood-level police stop rates among White and Asian birthing people.

Our secondary analysis examined racial concordance between the birthing person's race and the stop rates of people of the same race. The highest neighbourhood stop rates of Black people were associated with increased preterm birth risk among Black birthing people in the first trimester (aRR: 1.72, 95% CI 1.22 to 2.44) compared with the lowest tertile (figure 1). We found positive associations with increased stop rates of Black people in the other exposure windows, but all CIs included the null. We found no significant associations between neighbourhood-level stops of White people and preterm birth among White birthing people.

DISCUSSION

Our study sought to examine the association between neighbourhood policing and preterm birth across critical periods before and during pregnancy across racialised groups in Seattle. We found consistent increased preterm birth risk among Black birthing people living in neighbourhoods with greater police stops, but mixed results among other racialised groups. This aligns with other studies in Minneapolis and New Orleans that found increased preterm birth risk among Black birthing people living in neighbourhoods with more frequent policing.^{27 28} The null association among White people and positive association across preconception and pregnancy exposure windows among Black people bolsters evidence that neighbourhood policing can be conceptualised as a contextual stressor with differential racialised and gendered health impacts. These findings add to

Table 1 Individual and neighbourhood-level characteristics of births in Seattle, Washington, 2017–2019

	Total (n=25 909)	Preterm birth (n=1544)	Term birth (n=24 365)
Individual	N (%) or median (IQR)		
Race and ethnicity			
NH American Indian/Alaska Native	93 (0.4%)	8 (0.5%)	85 (0.3%)
NH Asian	4679 (18.1%)	292 (18.9%)	4387 (18.0%)
NH Black	2778 (10.7%)	176 (11.4%)	2602 (10.7%)
Hispanic/Latina/e	3831 (14.8%)	288 (18.7%)	3543 (14.5%)
NH multiracial	1069 (4.1%)	75 (4.9%)	994 (4.1%)
NH White	13 325 (51.4%)	693 (44.9%)	12 632 (51.8%)
Missing	134 (0.5%)	12 (0.8%)	122 (0.5%)
Born outside of USA	9395 (36.3%)	550 (35.6%)	8845 (36.3%)
Age	32.5 (5.05)	32.7 (5.59)	32.5 (5.01)
HS education or less	4498 (17.4%)	365 (23.6%)	4133 (17.0%)
Medicaid	6596 (25.5%)	496 (32.1%)	6100 (25.0%)
Prior preterm birth	467 (1.8%)	107 (6.9%)	360 (1.5%)
Male infant sex	13 071 (50.4%)	868 (56.2%)	12 203 (50.1%)
Neighbourhood			
ICE race income*			
Quintile 1 (least privileged)	7026 (27.1%)	487 (31.5%)	6539 (26.8%)
Quintile 2	4884 (18.9%)	310 (20.1%)	4574 (18.8%)
Quintile 3	4285 (16.5%)	238 (15.4%)	4047 (16.6%)
Quintile 4	5607 (21.6%)	301 (19.5%)	5306 (21.8%)
Quintile 5 (most privileged)	4107 (15.9%)	208 (13.5%)	3899 (16.0%)
Violent crime rate per 1000 residents	2.14 (0.93, 2.98)	2.24 (0.82, 3.16)	2.14 (0.93, 2.98)
Prepregnancy police stops per 10 000 residents			
Total stops	78.1 (26.51, 105.7)	81.16 (22.73, 107.4)	77.98 (26.67, 105.68)
Proactive stops	31.13 (9.28, 43.79)	32.22 (7.7, 44.16)	31.07 (9.35, 43.71)
Frisk	14.44 (5.53, 25)	15.76 (5.99, 26.41)	14.34 (5.52, 24.93)
Stops of Black people	328.57 (179.51, 850.34)	305.04 (154.87, 720.57)	329.5 (180.59, 855.01)
Stops of White people	61.68 (21.66, 93.37)	65 (20.82, 95.73)	61.46 (21.68, 93.23)
First trimester police stops per 10 000 residents			
Total stops	18.81 (5.92, 26.94)	19.41 (5.21, 27.25)	18.75 (5.94, 26.88)
Proactive stops	7.14 (2.2, 11.19)	7.4 (1.96, 11.64)	7.13 (2.2, 11.15)
Frisk	3.43 (1.31, 6.55)	3.7 (1.3, 6.71)	3.42 (1.31, 6.52)
Stops of Black people	76.24 (34.78, 186.05)	70.05 (19.17, 156.9)	76.45 (35.12, 186.95)
Stops of White people	14.9 (4.53, 23.3)	15.43 (4.16, 24.38)	14.9 (4.57, 23.25)
Second trimester police stops per 10 000 residents			
Total stops	18.66 (5.95, 26.66)	19.08 (5.52, 26.72)	18.61 (5.98, 26.66)
Proactive stops	7.12 (2.2, 11.27)	7.33 (1.85, 11.47)	7.12 (2.2, 11.25)
Frisk	3.42 (1.36, 6.57)	3.51 (1.36, 6.97)	3.42 (1.36, 6.55)
Stops of Black people	74.98 (32.4, 183.31)	68.81 (19.63, 161.87)	75.57 (33.14, 184.35)
Stops of White people	14.43 (4.47, 22.92)	14.62 (4.32, 23.57)	14.43 (4.48, 22.91)

* Calculated based on distribution of all neighbourhoods in Seattle to better reflect the racialised economic segregation in all of Seattle rather than based on the neighbourhoods that birthing people live in.
ICE, index of concentration at the extremes; NH, non-Hispanic.

the growing evidence of the indirect, intergenerational adverse health impacts of routine police practices.^{2 3}

We found mixed results of how neighbourhood-level police stops predicted preterm birth among other racially minoritised groups. Preterm birth inequities between Latina/e and White people were higher in Seattle compared with nationally. However, higher neighbourhood-level police stops were associated with lower preterm birth risk among Latina/e people. This finding does not align with the limited research suggesting that exposure to local police and its ties with immigration enforcement are associated with delayed/inadequate prenatal care and higher risk of adverse health outcomes like low birth weight among Latina/e people.^{47–50} This could be due to exposure misclassification

because our measure does not capture immigration enforcement and because zip codes with higher Latina/e populations overlapped with a neighbouring town's police jurisdiction for which we did not have data, resulting in underestimation of the association for Latina/e people. Interdisciplinary research using more comprehensive data is needed to elucidate the interconnected roles of local law enforcement, federal immigration and state anti-immigration policies as contextual stressors with direct and indirect health impacts among Latina/e communities (and potentially other communities with immigrants/refugees).⁴⁸ We also found that Asian birthing people experienced some of the highest median exposure to neighbourhood police stops across all exposure windows compared with other racialised groups,

Table 2 Adjusted risk ratios (aRR) and hazard ratios (aHR) for preterm birth associated with neighbourhood-level police stops in each exposure window, stratified by birthing person race and ethnicity, Seattle, Washington 2017–2019

Neighbourhood police stop rate (per 10 000)	All births, aRR (95% CI)	Asian births, aRR (95% CI)	Black births, aRR (95% CI)	Hispanic/Latina/e births, aRR (95% CI)	White births, aRR (95% CI)
Prepregnancy					
Overall stops					
Low (0, 46.9)	Ref.	Ref.	Ref.	Ref.	Ref.
Medium (46.9, 98.8)	1.02 (0.92 to 1.14)	1.06 (0.87 to 1.3)	1.38 (1.02 to 1.85)*	0.84 (0.66 to 1.07)	1.05 (0.86 to 1.28)
High (98.8, 911.3)	1.04 (0.87 to 1.24)	0.9 (0.69 to 1.17)	1.41 (0.85 to 2.33)	0.79 (0.57 to 1.1)	1.17 (0.87 to 1.59)
Police-initiated stops					
Low (0, 16.5)	Ref.	Ref.	Ref.	Ref.	Ref.
Medium (16.5, 38.6)	1.06 (0.95 to 1.17)	1.1 (0.87 to 1.37)	1.24 (0.88 to 1.73)	0.75 (0.61 to 0.92)**	1.14 (0.96 to 1.35)
High (38.6, 474.2)	1.05 (0.9 to 1.24)	0.88 (0.64 to 1.21)	1.36 (0.91 to 2.04)	0.85 (0.65 to 1.12)	1.23 (0.96 to 1.57)
Frisk-involved stops					
Low (0, 8.2)	Ref.	Ref.	Ref.	Ref.	Ref.
Medium (8.2, 20.7)	1 (0.87 to 1.14)	0.81 (0.62 to 1.06)	1.14 (0.76 to 1.72)	0.87 (0.66 to 1.14)	1.14 (0.91 to 1.43)
High (20.7, 150.3)	1.1 (0.98 to 1.23)	1.05 (0.82 to 1.35)	1.11 (0.67 to 1.86)	0.95 (0.65 to 1.39)	1.15 (0.93 to 1.41)
First trimester					
Overall stops					
Low (0, 10.2)	Ref.	Ref.	Ref.	Ref.	Ref.
Medium (10.2, 24.3)	0.92 (0.81 to 1.06)	0.91 (0.7 to 1.17)	1.16 (0.82 to 1.66)	0.78 (0.64 to 0.96)*	0.96 (0.74 to 1.25)
High (24.3, 200.1)	1.02 (0.87 to 1.2)	0.85 (0.59 to 1.21)	1.74 (1.17 to 2.57)**	0.64 (0.49 to 0.84)**	1.19 (0.86 to 1.65)
Police-initiated stops					
Low (0, 3.7)	Ref.	Ref.	Ref.	Ref.	Ref.
Medium (3.7, 9.7)	0.95 (0.85 to 1.05)	0.96 (0.75 to 1.22)	1.18 (0.83 to 1.67)	0.89 (0.73 to 1.08)	0.94 (0.79 to 1.11)
High (9.7, 107.9)	1.04 (0.89 to 1.23)	0.94 (0.64 to 1.37)	1.46 (0.99 to 2.13)	0.78 (0.59 to 1.02)	1.16 (0.89 to 1.52)
Frisk-involved stops					
Low (0, 1.9)	Ref.	Ref.	Ref.	Ref.	Ref.
Medium (1.9, 5.3)	1 (0.88 to 1.14)	0.87 (0.72 to 1.04)	1.06 (0.67 to 1.68)	0.93 (0.74 to 1.17)	1.04 (0.83 to 1.31)
High (5.3, 45.5)	1.03 (0.89 to 1.18)	0.93 (0.67 to 1.3)	1.33 (0.9 to 1.98)	0.81 (0.59 to 1.12)	1.18 (0.91 to 1.51)
Second trimester					
Overall stops					
Low (0, 10.1)	Ref.	Ref.	Ref.	Ref.	Ref.
Medium (10.1, 24.2)	0.97 (0.82 to 1.14)	0.95 (0.74 to 1.23)	1.26 (0.89 to 1.78)	0.82 (0.65 to 1.02)	1.02 (0.79 to 1.31)
High (24.2, 189.4)	1.01 (0.89 to 1.13)	0.82 (0.62 to 1.08)	1.66 (1.14 to 2.42)**	0.6 (0.44 to 0.82)**	1.19 (0.97 to 1.47)
Police-initiated stops					
Low (0, 3.6)	Ref.	Ref.	Ref.	Ref.	Ref.
Medium (3.6, 9.7)	0.93 (0.81 to 1.06)	0.91 (0.73 to 1.14)	1.13 (0.82 to 1.56)	0.8 (0.65 to 0.97)*	0.98 (0.78 to 1.22)
High (9.7, 105.2)	0.94 (0.81 to 1.1)	0.95 (0.69 to 1.31)	1.54 (1.01 to 2.36)*	0.58 (0.43 to 0.79)***	1.01 (0.78 to 1.29)
Frisk-involved stops					
Low (0, 1.9)	Ref.	Ref.	Ref.	Ref.	Ref.
Medium (1.9, 5.3)	1.04 (0.89 to 1.21)	1.08 (0.87 to 1.35)	1.25 (0.82 to 1.91)	0.99 (0.69 to 1.43)	1.05 (0.81 to 1.36)
High (5.3, 44.1)	1.03 (0.88 to 1.2)	0.83 (0.63 to 1.09)	1.55 (1.01 to 2.4)*	0.87 (0.62 to 1.22)	1.13 (0.88 to 1.45)

*p<0.05; **p<0.01; ***p<0.001.

but had null associations with preterm birth. This could be due to issues with aggregation that mask the diverse experiences of various Asian communities with policing in Seattle.⁵¹ Future research should disaggregate by ethnicity and nativity to better disentangle subgroup-specific relationships between policing and preterm birth.⁵² Given these data limitations, we urge cautious interpretation of the findings for Latina/e and Asian people.

Implications

These findings contribute to the growing recognition of policing as a structural barrier to health equity.¹ First, public health research and practice should expand efforts to disrupt routine racialised police practices given it has widespread adverse community health impacts as seen in this study and others.^{15 16 18} Public health research has examined fatal police violence,² but

more studies that investigate these routine police practices can contribute to conceptualising these police killings not as an aberration but as a result of the violence of these everyday police practices in criminalised communities.⁵³ Second, these findings bolster the long-term calls of community members, advocates and broader social movements to limit the presence of policing and police surveillance and instead invest in community-led programmes that address the root causes of harm and health outcomes, such as housing, healthcare, education and employment.⁵⁴

Strengths and limitations

This study leverages a unique policing dataset to advance the nascent literature on community-level health effects of policing by calculating temporal-and-spatial-specific exposure measures

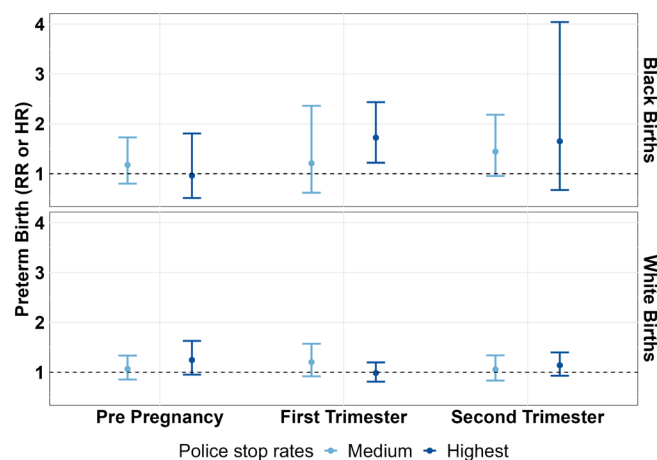


Figure 1 Adjusted risk or HR of neighbourhood-level stops of Black people among Black births and stops of White people among White births, stratified by exposure window, Seattle 2017–2019. Risk ratio (RR) for pre-pregnancy and first trimester, HR for second trimester.

for three critical periods of susceptibility. However, there are important limitations. First, Seattle has lower preterm birth prevalence (6% vs 10% national average) so generalisability outside Seattle is limited. Second, reliance on administrative data likely underestimated exposures as SPD data do not capture all relevant police–community interactions (eg, county sheriff, federal immigration enforcement), only those recorded by SPD.¹⁵ Third, zip codes might not be a good proxy for neighbourhoods due to their large and varying sizes, socioeconomic heterogeneity and limited granularity compared with census tract/block, thus leading to potential misclassification of the exposure.⁵⁵ Additionally, residential zip code does not capture non-residential exposures to policing, thus potentially underestimating exposure. We also assumed that residential zip code at birth was the same before and during pregnancy which may not be the case, particularly for those who are economically marginalised and experiencing housing instability. Fourth, the relatively smaller subgroup sizes, particularly for Black and Latina people (11% and 15% of the study population, respectively), can result in wider CIs that cross the null, which should be considered in the interpretation of findings. Fifth, because police violence is associated with pregnancy loss,⁴⁴ there is potential for exposure-induced selection in which fewer than expected pregnancies that resulted in live births were preterm because the fetuses most likely to experience these outcomes were lost prior to birth. This would likely underestimate the association between police stops and preterm birth. Lastly, data limitations precluded us from conducting regression analyses among Indigenous and multi-racial birthing people and, given the disparate policing among Indigenous communities in particular, future research should better incorporate these racialised groups.

CONCLUSION

This study expands evidence of the reproductive health impacts of policing by including multiple racialised groups and establishing precise temporal ordering. Results indicate that Black birthing people experience increased preterm birth risk in neighbourhoods with more frequent police stops, suggesting that the core functions of policing act as a racialised gendered stressor with broad negative health impacts. The mixed results among other racially minoritised people require further investigation with larger and more robust datasets that better captures community

carceral surveillance, including immigration enforcement. The persistent racialised inequities in perinatal health demand that public health research and practice address the ways that structural racism, including racialised police practices, contribute to these inequities.

X Mienah Z Sharif @mienahzs

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ORCID iD

Taylor Riley <http://orcid.org/0000-0002-4963-0455>

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