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Collateral Damage: The Health Effects of Invasive Police Encounters in New York City

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ABSTRACT *The health effects of police surveillance practices for the community at-large are unknown. Using microlevel health data from the 2009–2012 New York City Community Health Survey (NYC-CHS) nested within mesolevel data from the 2009–2012 NYC Stop, Question, and Frisk (NYC-SQF) dataset, this study evaluates contextual and ethnoracially variant associations between invasive aspects of pedestrian stops and multiple dimensions of poor health. Results reveal that living in neighborhoods where pedestrian stops are more likely to become invasive is associated with worse health. Living in neighborhoods where stops are more likely to result in frisking show the most consistent negative associations. More limited deleterious effects can be attributed to living in neighborhoods where stops are more likely to involve use of force or in neighborhoods with larger ethnoracial disparities in frisking or use of force. However, the health effects of pedestrian stops vary by ethnoracial group in complex ways. For instance, minorities who live in neighborhoods with a wider racial disparity in police behavior have poorer health outcomes in most respects, but blacks have lower odds of diabetes when they live in neighborhoods where they face a higher risk that a stop will involve use of force by police than do whites. The findings suggest that the consequences of institutionalizing a carceral state are far-reaching.*

KEYWORDS *Health, Police, Neighborhoods, New York City, Race, Ethnicity, Health disparities*

INTRODUCTION

In the early 1990s, New York City (NYC) widened the surveillance reign of the criminal justice system with "Stop, Question, and Frisk" (SQF).[1,2] SQF resulted in widespread use of *Terry* stops, where police temporarily detain, without probable cause, those pedestrians that they believe may be acting suspiciously.[3] To protect themselves, police officers may also quickly search a pedestrian's exterior for weapons (i.e., frisking). Data from the New York Civil Liberties Union indicates that almost 88 % of pedestrians stopped between 2009 and 2012 were innocent and that less than 2 % of frisks recovered illegal weapons.[4] Of 685,724 stops in 2011—the peak of SQF policing, over 55 % involved frisking, and police used physical force in over one fifth of stops.[5] Moreover, nearly 9 out of 10 pedestrian stops involved either blacks or Latinos[5]—"ethnoracial" minorities.[6] Research shows police frisk black pedestrians more often than white pedestrians, even though officers find illegal weapons on a larger proportion of white pedestrians.[7] As civilian complaints of police abuse rose during the 1990s, trust in police among blacks eroded,[8] especially for those in economically disadvantaged neighborhoods.[9]

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Research shows contact with the criminal justice system is detrimental to physical and mental health. For instance, people who have been in contact with jails or prisons have diminished health.[10–14] Yet, few studies address the impact of increased police surveillance on individual health. Studies do indicate that blacks' experience of "criminal justice injustices," in the form of invasive police encounters, has health consequences.[15] A recent study found that the probability of young men in New York City reporting trauma and anxiety symptoms increased with their frequency of police contact, especially among those reporting intrusive and/or unfair police stops.[16] Among adolescents, substance users, and sex workers,[17–20], associations have been found between police contact and reports of mental health problems, problem behaviors, and HIV-risk behavior. However, outside of these vulnerable populations, the impact of police contact on health is understudied.

Contact with the police can become an everyday stressor in some neighborhoods; everyday stressors produce wear and tear on the body, which has been shown to increase physiological strain[21–23] and limit disease resistance. Invasive encounters can operate as ecological stressors and contribute to a "climate of fear"[24] among persons living in areas inundated by SQF practices. Since observing another person's distress also activates psychophysiology,[25–27] people living in highly policed neighborhoods need not be targeted by Terry stops to be physiologically affected by them. Furthermore, invasive policing practices may be associated with increased fear of being perceived as a criminal among those not involved in crimes. Invasive policing may also elicit hypervigilance, which produces harmful physiological responses, such as elevated blood pressure, heart rate, and stress biomarkers.[28]

Repeated hypervigilance heightens the "costs of coping" and coping fatigue[29,30] for people living in highly policed neighborhoods. Through placing the body's coping system in overdrive for extended periods of time, the "weathering" process may be activated, which increases allostatic load.[23] Such responses may occur among persons that only indirectly experience criminal justice system contact, as is suggested by research on the collateral consequences of mass incarceration, which include negative health effects that extend to kin (e.g., children, mothers of children) of those who have been incarcerated.[31–34] Uniquely so, we focus on whether such "collateral" effects extend to residents of neighborhoods where people are surveilled by police.

Additionally, living in neighborhoods where minorities are more likely to be stopped, frisked, and have force used against them may be associated with ill effects for neighborhood residents. The most convincing line of research that supports such an assertion is located among studies of perceived discrimination. Poor/fair health, depression, hypertension, obesity, and chronic illnesses are more likely among individuals reporting unfair treatment.[35–43] Invasive police encounters may produce negative health effects because neighborhood residents experience them as instances of unfair treatment.[22,44]

Relatedly, police-related behavior is the sixth most common institutional source of unfair treatment in the general population,[37] and one of the most frequently cited forms of unfair treatment among minorities.[37,45,46] While only 5.6 % of the nation reports being hassled by the police, 19.3 % of non-Latino blacks and 15.7 % of other racial/ethnic groups do.[37] Ethnoracial minorities believe police are unfair, abusive, and more likely to target them than their white peers.[47–52] These perceptions increase the negative health effects of police encounters.[22,44] To cope with distress, some people may smoke, drink, or be inactive, leading to physical health problems.[53]

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This study estimates the health effects of invasive policing for the community at-large. It addresses three research questions: First, what are the health effects of stop concentration in particular neighborhoods? Second, is there an association between poor health and invasive Terry stops, holding constant key correlates of health? Third, do the health effects of neighborhood invasive police encounters, however defined, vary ethnoracially? It controls for segregation, which is important both because segregation is associated with health, and because police use the racial and economic composition of neighborhoods to develop surveillance strategy.[54]

METHODS

Sources of Data

The dataset consists of a pooled sample of adults (N=36,188) participating in the 2009–2012 New York City Community Health Survey (NYC-CHS) conducted by the New York City Department of Health and Mental Hygiene (NYCDOHMH).[55] NYC-CHS is an annual random-digit-dial health survey of approximately 10,000 non-institutionalized adult (18+) New Yorkers. Through self-reported data and use of post-stratification weights, it evaluates the health of city residents by neighborhood and across subpopulations. Interviews by telephone or cell phone measure a broad range of health indicators based on the national Behavioral Risk Factor Surveillance System coordinated by the US Centers for Disease Control and Prevision. The publicly available data are exempt from IRB review by the authors' institutions.

The NYC-CHS dataset includes neighborhood identifiers for all but 215 respondents (0.59 %) surveyed, using 34 United Hospital Fund neighborhoods (UHFs). UHFs are collections of contiguous zip codes, which are used to track health by the NYCDOHMH.[56,57] Administrative data from the New York City Stop, Question, and Frisk Database (NYC-SQF) provide stop-level data annually,[58] which are aggregated to the neighborhood level by geocoding stop locations for 2,338,120 of the 2,338,950 pedestrian stops (99.9 %) occurring during 2009–2012. We use these data to characterize people's neighborhoods, the ethnoracial status of the person stopped in their neighborhoods, and the outcome of the stop. The NYC-CHS years are chosen to overlap with the NYC-SQF years, so as to capture the health effects of contemporaneous police behaviors.

Outcome Measures

This study considers self-reported overall health status, diabetes and high blood pressure diagnosis from a medical professional, asthma episode occurrence in the past year, and overweight/obese body mass index. Self-reported overall health status is determined by responses to the following question: "Would you say in general that your health is: excellent, very good, good, fair, or poor?" The outcome is dichotomized, where fair and poor ratings indicate poor health. Medically diagnosed diabetes and high blood pressure are determined by responses to the following question: "Have you ever been told by a doctor, nurse or other health professional that you have [condition]?" Asthma episodes are determined by responses to the following question: "In the last 12 months, have you had an episode of asthma or an asthma attack?" Overweight/obese body weight is calculated by the NYCDOHMH and provided in the dataset. All outcomes are dichotomous.

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Prior research indicates that physical health outcomes vary little by neighborhood.[59] This pattern is also true for the health outcomes evaluated in this study. The intraclass correlations indicate that 4.0 % of the variation in self-rated health, 3.6 % of the variation in diabetes, 1.3 % of the variation in high blood pressure, 3.8 % of the variation in asthma, and 3.7 % of the variation in overweight/obesity is attributable to UHFs.

Independent Variables

At the individual level, a 4-category measure of ethnoraciality is situated as the independent variable. People classified as white non-Latinos are the reference category, and dummy indicators are included for ethnoracial minorities, including black non-Latinos, Latinos, and Asian/Pacific Islander non-Latinos. Non-Latino individuals who identified as other races were dropped from the analysis due to small sample sizes ($N=645$).

At the neighborhood level, we consider six policing characteristics as independent variables. All neighborhood-level independent variables are centered at their means and standardized. First, the neighborhood stop rate is measured as the number of stops in a UHF per 100 non-institutionalized residents. Second, a measure of racial disparities in the neighborhood stop rate is constructed by dividing the number of stops of blacks or Latinos in a UHF per 100 non-institutionalized black non-Latinos or Latinos in the population by the number of stops of Whites in a UHF per 100 non-institutionalized white non-Latinos in the population.

Third, the neighborhood frisk likelihood is measured as the proportion of stops in a neighborhood involving frisking. Frisking is reported per stop by officers and includes quickly passing the hands over a pedestrian's clothes or through a pedestrian's pockets. Fourth, the neighborhood minority/white frisk ratio is measured by dividing the proportion of stops of blacks and Latinos in a neighborhood that involve frisking by the proportion of stops of whites in a neighborhood that involve frisking. The frisking ratio measures the relative extent to which black and Latino pedestrians who are stopped experience frisking over and beyond the extent stopped white pedestrians experience frisking.

Fifth, the neighborhood use of force likelihood is measured as the proportion of stops in a neighborhood involving the use of force. Nine types of physical force by officers are reported per stop: the use of the officer's hands, placing a pedestrian on the ground, placing a pedestrian against the wall, drawing the officer's weapon, pointing the weapon at the pedestrian, and use of baton, handcuffs, pepper spray, or other physical object to control a pedestrian. A stop where any one of the nine indicators of use of force is reported is considered a stop that involves use of force. To create the neighborhood use of force likelihood measure, the number of stops that involve force is divided by the number of stops in the UHF neighborhood. Sixth, the neighborhood minority/white use of force ratio is measured by dividing the proportion of stops of blacks and Latinos in a neighborhood that involve use of force by the proportion of stops of whites in a neighborhood that involve use of force. The use of force ratio measures the relative extent to which black and Latino pedestrians who are stopped experience use of force over and beyond White pedestrians who are stopped.

There is a strong relationship between frisking and the use of force. For instance, 41 % of the variance in neighborhood frisk likelihood is shared by neighborhood use of force likelihood ($r=0.642$; $p<0.0001$). As such, these variables, while representing distinct characterizations of the police encounter, cannot be evaluated

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simultaneously. Correlations among other pairs of the policing variables of interest are much lower. Only the relationship between neighborhood use of force proportions and neighborhood use of force ratios ($r=0.432$; $p=0.012$) is statistically significant. This study evaluates each of the six UHF-level indicators of invasive police encounters, separately.

Control Variables

At the individual level, we consider key sociodemographic (age, gender, nativity, marital status, household size, language spoken at home); socioeconomic (educational attainment, income, work status); and healthcare access (health insurance status, unmet medical care needs) variables using data from the NYC-CHS. Except for age and household size, all individual-level variables are categorical as described in Table 1. Age is mean-centered at 52 years; household size is top-coded at five and median-centered at two people. Dummy indicators for period of interview—2010, 2011, and 2012—are used (reference category is 2009).

At the neighborhood level, data from the NYC-SQF reveals the proportion of stops that result in an arrest, or stop productivity, per UHF. New York Police Department data are used to develop a neighborhood crime variable, which is the total robbery complaint per UHF. The 2010 US Decennial Census provides a measure of the total number of persons living in a neighborhood that are currently living in correctional facilities. The analysis also includes three measures of segregation from the 2010 US. Decennial Census: (1) the proportion of the population that identifies as black or Latino, (2) the proportion of households with incomes below the federal poverty line, and (3) a measure of affluence concentration (a z score for the proportion of owner-occupied homes and the proportion of households with incomes above US$50,000 a year [$r=0.73$]). All neighborhood-level control variables are centered at their means and standardized.

Statistical Analyses

The statistical modeling framework employed in this study anticipates that individual reports of poor health and illness are partly a function of the UHF to which an individual belongs. Weighted multilevel models with random intercepts are used to make inferences about the population of individuals living in NYC neighborhoods. Stata 14.0 is used for all analyses. After excluding the missing data on the outcome and predictor variables, we conduct two sets of regression analyses on 32,452 individuals (89.7 % of the sample) nested within 34 New York City UHFs for each outcome-policing pair: One where the effects of policing are averaged/pooled over the ethnoracial subgroups of the sample and an interaction analysis where the effects of policing are assumed to be ethnoracially specific. For the second model, health effect estimates are stratified by ethnoracial group (instead of presented as the difference of effect estimate). Estimates of excluded covariates are available upon request.

RESULTS

Descriptive Statistics of Neighborhood Stops

Table 1 provides an unweighted summary of the final data considered for the analysis. While a substantial portion of pedestrian stops evaluated in this study involves body searches and the use of force, the proportion of stops that produce an

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t1.1 **TABLE 1 Unweighted descriptive statistics for individual and neighborhood-level covariates: 2009–2012 NYC community health survey (*N*=32,452) and 2009–2012 NYC Stop, Question, and Frisk database (*N*=34)**

t1.4		Mean/ Median	Standard deviation	Min	Max
t1.5	Health outcomes (*N*=32,452)				
t1.6	Poor/fair health[a]	23.73		0	1
t1.7	Diabetes[b]	12.65		0	1
t1.8	High blood pressure[b]	35.38		0	1
t1.9	Asthma[b]	4.78		0	1
t1.10	Overweight/obese[b]	59.73		0	1
t1.11	Individual-level covariates (*N*=32,452)				
t1.12	Black non-Latino[b]	22.63		0	1
t1.13	Latino[b]	25.42		0	1
t1.14	Asian/Pacific Islander[b]	7.65		0	1
t1.15	White[b]	44.30		0	1
t1.16	2009 (reference category)[b]	27.64		0	1
t1.17	2010[b]	23.92		0	1
t1.18	2011[b]	24.19		0	1
t1.19	2012[b]	24.25		0	1
t1.20	Male (0 = female)[b]	40.69		0	1
t1.21	Age (in Years)	52.38	17.28	18	98
t1.22	Less than high school (reference category)[b]	14.55		0	1
t1.23	High school (ref. less than high school)[b]	22.04		0	1
t1.24	Some college (ref. less than high school)[b]	20.69		0	1
t1.25	College degree (ref. less than high school)[b]	42.72		0	1
t1.26	Employed (0 = unemployed)[b]	55.25		0	1
t1.27 t1.28	Income less than poverty line (reference category)[b]	19.38		0	1
t1.29	Income 1–2× poverty line[b]	15.90		0	1
t1.30	Income 2–4× poverty line[b]	14.84		0	1
t1.31	Income 4–6× poverty line[b]	14.60		0	1
t1.32	Income more than 6× poverty line[b]	21.23		0	1
t1.33	Don't know income[b]	8.14		0	1
t1.34	Missing poverty data[b]	5.91		0	1
t1.35	US born (0 = not US born)[b]	62.38		0	1
t1.36	Insured (0 = not insured)[b]	88.59		0	1
t1.37	Unmet medical care last year (0 = Met)[b]	9.32		0	1
t1.38	Household size	2.43	0.35	1	6
t1.39 t1.40	Currently married/cohabitating (reference category)[b]	43.70		0	1
t1.41	Formerly married (ref. married/cohabitating)[b]	29.98		0	1
t1.42	Never married (ref. married/cohabitating)[b]	26.32		0	1
t1.43	Primarily english at home (reference category)[b]	75.05		0	1
t1.44 t1.45	Primarily spanish at home (ref. primarily english)[b]	15.06		0	1
t1.46 t1.47	Primarily other language at home (ref. primarily english)[b]	9.89		0	1
t1.48	Neighborhood-level covariates (*N*=34)				
t1.49 t1.50	Stop rate per 100 non-institutionalized population	29.29	19.03	8.06	79.69
t1.51	Minority/white stop ratio	6.13	4.72	0.47	22.75
t1.52	Neighborhood frisk likelihood[b]	54.04	9.22	33.36	73.19
t1.53	Minority/white frisk ratio	1.25	0.16	0.89	1.68
t1.54	Neighborhood use of force likelihood[b]	20.86	7.19	10.30	34.86
t1.55	Minority/white use of force ratio	1.28	0.21	0.87	1.80
t1.56	Community arrest rate	6.83	2.17	3.32	12.07

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t1.57 t1.58 **TABLE 1** ***Continued***

t1.59		Mean/ Median	Standard deviation	Min	Max
t1.60	Total robbery complaints	410.65	1001.52	0	3864
t1.61	Total persons incarcerated	553.74	1924.40	0	11,101
t1.62	Percent black or Latino	51.45	28.63	10.61	96.59
t1.63	Percent below federal poverty line	18.91	8.75	6.17	38.98
t1.64	Affluence concentration	7.73	5.48	0.70	23.09
t1.65	Percent households more than US$50,000	49.57	13.06	21.71	75.97
t1.66	Percent owner-occupied units	31.88	17.18	6.86	72.78
t1.67	Observations				

t1.68 [a]Percentage reported

arrest or a summons is much lower. Only 7 % of stops produce an arrest, and only 6 % produce a summons. These figures are in line with the 2011 New York Civil Liberties Union (NYCLU) analysis of Stop, Question, and Frisk data, which showed that only 11.8 % of pedestrian stops produced either an arrest or a summons.[5] Furthermore, racial gaps in arrests and summons are small (supplemental analysis available upon request): stops of blacks and Latinos show similar arrests as stops of whites; although, there is a slightly higher likelihood that whites will receive a summons. There is more variance in likelihood of arrest/summons by neighborhood for stops of whites than those of blacks or Latinos.

Frisking is common and occurs in 56 % of all pedestrian stops. However, 48 % of stops of whites, compared to 58 % of stops of blacks or Latinos, involve frisking. Findings also mirror the 2011 NYCLU data in that physical force occurs less often than frisking. A quarter of pedestrian stops involve the use of some kind of force. Stops of blacks and Latinos more often include force than stops of whites, 26 and 21 %, respectively.

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Health Effects of Invasive Police Encounters

Table 2 examines the association between the six invasive police encounter measures and five poor health indicators—self-perceptions of health, medically diagnosed diabetes or high blood pressure, past year asthma episodes, and being overweight or obese. It shows weighted logit coefficients for the effect of one of the six measures of invasive police encounters, with individual demographics and socioeconomic status and neighborhood crime rates, economic status, and racial composition held constant. The analysis provides mixed evidence with regards to the health effects of living in a high stop neighborhood. On one hand, a standard deviation increase (SD=19.03) in the stop rate per 100 non-institutionalized population (mean=29.29, min=8.06, max=79.69) increases the odds of poor/fair perceptions of one's general health by 14.8 % (=exp(0.1382)=1.148) and the odds of having an asthma episode within the past year by 17.0 % (=exp(0.1572)= 1.170). On the other hand, a standard deviation increase in the neighborhood stop rate decreases the odds of a diabetes diagnosis by 11.5 % (=exp(−0.1213)=0.885) and the odds of having an overweight/obese body status by 15.1 % (=exp(−0.1626)=0.849). The stop rate is not associated with high blood pressure. An additional 19 stops per 100 non-institutionalized residents has countervailing effects on health.

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t2.1 **TABLE 2 The illness effects of neighborhood-level invasive police encounters: 2009–2012 NYC Community Health Survey (*N*=32,452) and 2009–2012 NYC**
t2.2 **Stop, Question, and Frisk (*N*=34)**

t2.3		Stop rate	Minority/white stop ratio	Frisk likelihood	Minority/white frisk ratio	Use of force likelihood	Minority/white use of force ratio
t2.4	Poor/fair health	0.14***	0.02	0.08***	0.06***	0.13***	0.19***
t2.5		(0.02)	(0.02)	(0.02)	(0.01)	(0.01)	(0.01)
t2.6	Diabetes	−0.12***	−0.12***	0.11***	0.08***	−0.03*	0.15***
t2.7		(0.02)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
t2.8	High blood pressure	0.03	−0.20***	0.16***	−0.01	−0.01*	0.09 ***
t2.9		(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
t2.10	Asthma episode	0.16***	−0.13***	0.14***	−0.03	0.09***	−0.11***
t2.11		(0.02)	(0.02)	(0.02)	(0.02)	(0.01)	(0.01)
t2.12	Overweight/obese	−0.16***	−0.18***	0.20***	−0.03***	0.06***	0.06***
t2.13		(0.02)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)

t2.14 Higher values indicate more illness, worse health. Weighted logits reported. Standard errors in parentheses. All models include individual- and neighborhood-level controls. See Table 1
t2.15 *$p<0.05$; **$p<0.01$; ***$p<0.001$

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Furthermore, racial disparities in the stop rate within neighborhoods are protective against illness for four of the five health outcomes considered. A standard deviation increase (SD=4.72) in the racial gap in the stop rate within neighborhoods (mean=6.13, min=0.47, max=22.75) reduces the odds of a diabetes diagnosis by 11.0 % (=exp(−0.1163=0.890), the odds of a high blood pressure diagnosis by 17.7% (=exp(−0.1954=0.823), the odds of an asthma episode within the past year by 12.3 % (=exp(−0.1314=0.877), and the odds of having an overweight/obese body status by 16.8% (=exp(−0.1836=0.832). The minority/white stop ratio is not associated with poor/fair health. As such, living in neighborhoods where minorities are much more likely to be stopped over and beyond whites is associated with better physical health for all residents.

However, the likelihood of a stop culminating in frisking increases the likelihood of poor health. For all five poor health indicators, the effect of the neighborhood frisk likelihood is positive and statistically significant. A standard deviation increase (SD=0.092) in the neighborhood frisk likelihood (mean=0.540, min=0.334, max=0.732) increases the odds of poor/fair perceptions of one's general health by 8.8 % (=exp(0.0842)=1.083), the odds of being diagnosed with diabetes by 11.7 % (=exp(0.1106)=1.117), the odds of being diagnosed with high blood pressure by 17.2 % (=exp(0.1587)=1.172), the odds of having an asthma episode in the past year by 14.8 % (=exp(0.1378)=1.148), and the odds of having a body mass index that is overweight or obese by 22.2 % (=exp(0.201)=1.222). As such, a 9 % point increase in the neighborhood frisk likelihood has substantial effects on individual health status ($p<0.001$).

Moreover, racial differences in frisk likelihoods within neighborhoods are associated with illness and poor health—but in complex ways. A standard deviation increase (SD=0.156) in the minority/white frisk ratio (mean=1.25, min=0.89, max=1.68) increases the odds of poor perceptions of one's general health by 5.7 % and the odds of having a diabetes diagnosis by 8.3 % but decreases the odds of overweight/obese body weight by 3.3 %. The minority/white frisk ratio is not associated with either high blood pressure or past year asthma episode. These findings indicate that a 15 % point increase in the relative likelihood of frisking of minorities (vs. whites) can affect health.

Poor health also varies along with the proportion of neighborhood stops involving use of force. A standard deviation increase (SD=0.071) in the neighborhood use of force likelihood (mean=0.209, min=0.103, max=0.349) increases the odds of poor/fair perceptions of one's health by 14.2 %, the odds of an asthma episode by 9.6 %, and the odds of being overweight/obese by 5.7 % ($p<0.001$). These associations indicate that even small increases in the neighborhood use of force likelihood can be harmful to one's health. Still, the use of force likelihood is protective against diabetes ($p=0.019$) and high blood pressure ($p=0.022$) in the pooled sample.

Nonetheless, the minority/white use of force ratio is linked to poor health. Individuals living in a neighborhood where a greater proportion of black or Latino stops (mean=1.28, SD=0.21, min=0.87, max=1.80) involve force (relative to white stops) are more likely to perceive their own health as poor/fair, to be diagnosed with diabetes and high blood pressure, and to be overweight/obese than an individual living in a neighborhood where the distribution of force within stops is less unequal. Some counterintuitive associations are identified, however: asthma episodes are less likely to be reported in the past year if an individual lives in a neighborhood with a greater minority/white use of force ratio.

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t3.1 **TABLE 3 Race-specific illness effects of neighborhood-level invasive police encounters: 2009–2012 NYC Community Health Survey (*N* = 32,452) and 2009–2012**
t3.2 **NYC Stop, Question, and Frisk (*N* = 34)**

t3.3		Stop rate	Minority/white stop ratio	Frisk likelihood	Minority/white frisk ratio	Use of force likelihood	Minority/white use of force ratio
t3.4	Poor/fair health						
t3.5	Whites	0.08	0.05	0.03	−0.01	0.14***	0.15***
t3.6		(0.06)	(0.03)	(0.03)	(0.03)	(0.04)	(0.03)
t3.7	Blacks	0.10*	0.04	−0.02	−0.05	0.08*	0.12**
t3.8		(0.04)	(0.05)	(0.04)	(0.07)	(0.03)	(0.05)
t3.9	Latinos	0.19***	0.12*	−0.05	0.21***[a]	0.07	0.21***
t3.10		(0.04)	(0.05)	(0.04)	(0.04)	(0.04)	(0.06)
t3.11	Asian/Pacific Islander	−0.06	0.08	0.06	0.04	0.18**	0.32*** [a]
t3.12		(0.12)	(0.12)	(0.07)	(0.08)	(0.06)	(0.06)
t3.13	Diabetes						
t3.14	Whites	−0.29***	−0.23***	0.15***	−0.05	−0.04	0.22***
t3.15		(0.07)	(0.04)	(0.03)	(0.05)	(0.06)	(0.03)
t3.16	Blacks	−0.18***	0.03[a]	−0.06[a]	0.10	−0.09*	0.09*** [a]
t3.17		(0.04)	(0.07)	(0.07)	(0.07)	(0.04)	(0.03)
t3.18	Latinos	−0.01	−0.04	0.04	0.24***[a]	0.03	0.13**
t3.19		(0.06)	(0.08)	(0.05)	(0.07)	(0.05)	(0.04)
t3.20	Asian/Pacific Islander	−0.05	−0.28**	0.27***	−0.12	0.03	0.08
t3.21		(0.12)	(0.09)	(0.07)	(0.10)	(0.08)	(0.09)
t3.22	High blood pressure						
t3.23	Whites	−0.12*	−0.22***	0.10***	−0.08**	−0.05	0.05*
t3.24		(0.06)	(0.02)	(0.03)	(0.03)	(0.03)	(0.02)
t3.25	Blacks	0.09**	0.00	0.05	0.13*[a]	0.04	−0.01
t3.26		(0.03)	(0.05)	(0.04)	(0.05)	(0.03)	(0.03)
t3.27	Latinos	0.06	−0.14**	0.21***[a]	0.04[a]	0.17***[a]	0.13***
t3.28		(0.04)	(0.05)	(0.03)	(0.04)	(0.03)	(0.03)
t3.29	Asian/Pacific Islander	0.20*[a]	−0.18*	0.17*	−0.12	0.17**[a]	0.01
t3.30		(0.09)	(0.09)	(0.07)	(0.08)	(0.05)	(0.08)
t3.31	Asthma episode						
t3.32	Whites	0.26*	−0.22***	0.08	0.00	0.06	0.00

t3.33		(0.12)	(0.04)	(0.05)	(0.05)	(0.06)	(0.04)
t3.34	Blacks	0.13	−0.03	0.09	0.02	0.04	−0.13
t3.35		(0.07)	(0.07)	(0.06)	(0.06)	(0.05)	(0.08)
t3.36	Latinos	0.04[a]	−0.29***	0.24***[a]	−0.11*	0.09	−0.02
t3.37		(0.05)	(0.07)	(0.04)	(0.05)	(0.05)	(0.05)
t3.38	Asian/Pacific Islander	0.15	−0.32 ***	0.30 ***	−0.25	0.03	−0.25
t3.39		(0.21)	(0.10)	(0.09)	(0.23)	(0.16)	(0.18)
t3.40	Overweight/obese						
t3.41	Whites	−0.24***	−0.21***	0.23***	−0.12***	0.07	0.08***
t3.42		(0.04)	(0.02)	(0.02)	(0.03)	(0.04)	(0.02)
t3.43	Blacks	−0.07**[a]	−0.10*[a]	0.08[a]	0.05	0.02	−0.09*[a]
t3.44		(0.03)	(0.05)	(0.04)	(0.06)	(0.03)	(0.04)
t3.45	Latinos	−0.15***	−0.07	0.11*[a]	0.07[a]	0.06*	0.08**
t3.46		(0.03)	(0.09)	(0.04)	(0.05)	(0.02)	(0.02)
t3.47	Asian/Pacific Islander	−0.13	−0.08[a]	0.24**	−0.04	0.18**	0.04
t3.48		(0.13)	(0.05)	(0.08)	(0.06)	(0.07)	(0.04)

t3.49 Higher values indicate more illness, worse health. Weighted logits reported. Standard errors in parentheses. All models include individual- and neighborhood-level controls. See Table 1

t3.50 *$p<0.05$; **$p<0.01$; ***$p<0.001$

t3.51 [a] Statistically different from whites, $p<0.05$

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Ethnoracial Group-Specific Effects of Invasive Police Encounters

Some of the health effects of invasive police encounters at the neighborhood level, however, are conditioned upon ethnoraciality. Such patterns, if present, may clarify the aforementioned protective effects of invasive policing. Table 3 shows group-specific effects of the six measures of invasive police encounters for the four ethnoracial groups. It reveals substantial ethnoracial variation in the effects of neighborhood-level policing measures on health. This section focuses on ethnoracial differences in the health effects of policing measures that are statistically significant ($p<0.05$), as well as policing measures that affect minorities but not whites.

Table 3 indicates that the stop rate does not exert similar affects across ethnoracial groups. For poor/fair perceptions of health, the stop rate is detrimental for blacks and Latinos but not for whites or Asian/Pacific Islanders. Moreover, while the stop rate is protective against diabetes diagnoses for whites and blacks, it has no effect on diabetes diagnoses for Latinos ($p<0.05$). Similarly, while the stop rate is protective against high blood pressure diagnoses among whites, the blood pressure effects of the stop rate are more detrimental for all ethnoracial minority groups, especially blacks and Asian/Pacific Islanders. Similarly, the stop rate is detrimental for the experience of asthma episode in the past year among whites but not Latinos ($p<0.05$). The stop rate is less protective against overweight/obese body status for blacks than for whites ($p<0.05$).

The minority/white stop ratio shows more limited differential effects. While the pooled model indicates no association between poor/fair health and the minority/white stop ratio, the group-specific model indicates that living in neighborhoods where blacks and Latinos are stopped more often than whites diminishes Latino's perceptions of their health. Moreover, living in a neighborhood where blacks and Latinos are more likely than whites to be stopped is not protective against diabetes, high blood pressure, past year asthma episodes, or being overweight/obese for blacks. Similarly, living in a neighborhood where Blacks and Latinos are more likely than whites to be stopped is not protective against overweight/obese body status for Asian/Pacific Islanders.

Table 3 also reveals that while an increase in the proportion of neighborhood stops involving frisking increases Whites' likelihood of diabetes, no such association exists for Blacks—implying smaller ethnoracial differences in diabetes in neighborhoods where more stops result in frisking. Body weight shows a similar pattern: blacks and Latinos demonstrate weaker effects of frisking likelihood. Stratification by ethnoracial group reveals an association between frisk likelihood and past year asthma episodes for Asians/Pacific Islanders but not whites. Moreover, the high blood pressure effects of frisk likelihoods are stronger for Latinos than for whites ($p<0.05$).

Table 3 further reveals that the minority/white frisk ratio has associations with poor health for minorities but not whites. For whites, the minority/white frisk ratio is protective against high blood pressure and obesity. Among Latinos, however, the odds of poor/fair health increases 22.8 % as the minority/white frisk ratio increases one standard deviation (SD = 0.156). The effect of the minority/white frisk ratio on the health of Latinos is statistically distinguishable from and stronger than the effect of the minority/white frisk ratio on the health of whites ($p=0.0004$). Diabetes and high blood pressure diagnoses show a similar pattern. A standard deviation increase in the minority/white frisk ratio is associated with a 14.4 % increase in high blood pressure diagnoses among blacks. The effect of the minority/white frisk ratio on high blood pressure is 25.2 % more deleterious for blacks than for whites and 13.7 % more deleterious for Latinos. The minority/white

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frisk ratio is protective against asthma episodes for Latinos ($p=0.042$) but has no effect on Latino body weight status ($p=0.019$).

More limitedly, the proportion of neighborhood stops where force is used exerts differential effects for ethnoracial minorities. The high blood pressure diagnosis effect of the neighborhood use of force likelihood is about 22.3 % stronger for Latinos and Asians/Pacific Islanders than for whites ($p<0.01$). Latinos and Asians/Pacific Islanders are more likely to have a clinical diagnosis for high blood pressure in neighborhoods where force is used more frequently during pedestrian stops. A similar pattern for Latinos and Asians/Pacific islanders is found for being overweight/obese.

The minority/white use of force ratio exerts a stronger effect on the Asian/Pacific Islander odds of poor/fair health ($p<0.001$). However, the minority/white use of force ratio exerts a weaker (i.e., less negative) effect on the odds of diabetes for blacks than for whites ($p<0.01$). A 17.8 % weaker effect is observed for blacks than whites. The weaker effect of the minority/white use of force ratio on blacks than on whites suggests that black-white diabetes disparities are smaller in areas where pedestrian stops of minorities are more likely to involve use of force than are pedestrian stops of whites and larger in areas where pedestrians stops are more evenly distributed by ethnoraciality. A similar pattern is detected for being overweight/obese: The effect of the minority/white use of force ratio is 15.5 % weaker among blacks than among whites.

DISCUSSION

This paper provides a starting point to evaluate the relationship between health and invasive aspects of Terry stops. It shows that, holding constant crime levels, segregation measures, and known sociodemographic correlates of health, community-level Terry stop patterns associate with individual-level illness. These results suggest police actions matter not only for individuals who have contact with police, but also for individuals living in highly and inequitably policed areas.

We find a statistically significant main effect for frisks on all health indicators measured. In areas where pedestrian stops are more likely to culminate in frisking, the prevalence of poor/fair health, diabetes, high blood pressure, past year asthma episodes, and heavier body weights is higher. The minority/white use of force ratio is also associated with poor/fair health, diabetes, high blood pressure, and being overweight/obese. Other measures of invasive policing encounters demonstrate more limited and countervailing health effects. For instance, the use of force likelihood was associated with higher risks of poor/fair health, asthma, and being overweight/obese but lower risks of high blood pressure. Still, for 80 % of the invasive policing encounter associations evaluated, contextual measures of Terry stops are associated with poor health. Meanwhile, poor health is not associated with living in an area inundated with stops and is actually less prevalent in areas with greater racial disparities in the stop rate.

The effects of contextual invasive police patterns varied by ethnoracial group. Being a minority increases the severity of some effects of invasive police encounters. For instance, the minority/white frisk ratio is associated with increased high blood pressure for blacks and poor/fair health for Latinos, while the minority/white force ratio is associated with increased poor/fair health for Asian/Pacific Islanders. In other cases, however, invasive police encounters have weaker effects on minorities than on whites (e.g., diabetes for blacks). These counterintuitive findings suggest

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some protective effects of police surveillance for minorities that may be associated with perceptions of crime prevention and violence exposure reduction.

This study provides a preliminary assessment of the health effects of police surveillance using administrative data from New York City's SQF program. The general pattern identified in this multilevel analysis is that people report worse health if they live in neighborhoods where stops are invasive. These associations provide a way to understand the long reach of the expansion of the surveillance arm of the criminal justice system: People do not have to be inside the criminal justice system to feel the effects of the criminal justice system. In fact, the surveillance policies of the criminal justice system reach so far as to shape the health of people who have not yet entered into its gates. As such, these findings suggest that broadening the scope of surveillance policing by loosening the requirement of probable cause imposes a heavy burden.

This study has several limitations. First, it relies on administrative data. While these data provide a uniform measure, prior research shows administrative data can undercount the use of force.[60] Citizen reports of police abuse provide an alternative way of measuring use of force, especially use of force encounters that are considered excessive in the eyes of neighborhood residents. Second, the study has no individual measure of invasive policing encounters. Thus, it does not reveal health risks associated with personally being stopped. Third, the study is cross-sectional; therefore, reverse causality, while conceptually unlikely, cannot be ruled out (i.e., worse health status leading to more aggressive policing).

Fourth, the study relies on an imperfect operationalization of neighborhoods. UHFs are broad; thus, spatial misclassification problems cannot be disregarded. Fifth, the placement of individuals in communities, and policing, is not random. Thus, an element of self-selection by individuals based on residential choice is present, but UHF propensities for rates of policing are not estimated. Self-selection into highly policed neighborhoods is important to consider because poorer people and racial minorities, who are more likely to be criminalized by police, have less agency in where they choose to live due to prevailing patterns of segregation.

Sixth, this study does not account for the issue of true exposure—that is, this study calculates exposure relative to the number of stops within a UHF neighborhood. Yet, alternative measures of exposure could take into consideration police activity relative to the population or the land area and evaluate the relative effect of different measures of pedestrian stop exposure. Seventh, neighborhood boundaries based on administrative records may lead to an underestimation of the health effects of invasive police encounters, as research indicates that neighborhoods based on egocentric boundaries produce more substantial and robust neighborhood effects.[61]

This study elucidates the contributions of community-level invasive police encounters to several illness indicators. Our findings suggest that police actions are of consequence to communities at-large. They point to the need for a more nuanced multilevel theory of the population and individual health effects of police brutality. Such efforts will need to explicitly consider both the individual effects of exposure to policing at supraindividual levels of geography and the unique vulnerabilities ethnoracial minorities exhibit to the inequities of the criminal justice system. Furthermore, it would be useful for future research to consider the duration and dynamics of exposure to invasive police encounters. This study provides a benchmark to consider how indirect exposures to invasive policing practices operate as illness-generating structures of society, not simply individual life events.

APPENDIX

TABLE 4 The effects of invasive police encounters on poor self-rated health, average and race-specific effects: 2009–2012 NYC Community Health Survey (*N* = 32,452) and 2009–2012 NYC Stop, Question, and Frisk (*N* = 34)

	Model 1				Model 2			
	Neighborhood frisk rate	Minority/white frisk ratio	Neighborhood use of force rate	Minority/white use of force ratio	Neighborhood frisk rate	Minority/white frisk ratio	Neighborhood use of force rate	Minority/white use of force ratio
Invasive policing measure	0.08***	0.06***	0.13***	0.19***				
	(0.02)	(0.01)	(0.01)	(0.01)				
White × invasive policing measure					0.03	−0.01	0.14***	0.15***
					(0.03)	(0.03)	(0.04)	(0.03)
Black × invasive policing measure					−0.02	−0.05	0.08*	0.12**
					(0.04)	(0.07)	(0.03)	(0.05)
Latino × invasive policing measure					−0.05	0.21***	0.07	0.21***
					(0.04)	(0.04)	(0.04)	(0.06)
Asian/Pacific Islander × invasive policing measure					0.06	0.04	0.18 **	0.32
					(0.07)	(0.08)	(0.06)	(0.06)
Black non-Latino	0.17*	0.16*	0.18**	0.17**	0.16 *	0.21**	0.17**	0.17**
	(0.06)	(0.06)	(0.06)	(0.07)	(0.06)	(0.07)	(0.07)	(0.06)
Latino	0.65***	0.65***	0.66***	0.65***	0.66***	0.67***	0.65***	0.66***
	(0.10)	(0.10)	(0.10)	(0.11)	(0.11)	(0.09)	(0.10)	(0.10)
Asian/Pacific Islander	0.45***	0.44***	0.46***	0.44***	0.42***	0.47***	0.42***	0.39***
	(0.10)	(0.09)	(0.10)	(0.10)	(0.10)	(0.10)	(0.09)	(0.10)
2010	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)
2011	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)
2012	−0.05	−0.05	−0.05	−0.05	−0.05	−0.05	−0.05	−0.05
	(0.09)	(0.09)	(0.09)	(0.09)	(0.09)	(0.09)	(0.09)	(0.09)
Community arrest rate	−0.21***	−0.26***	−0.25***	−0.08***	−0.21***	−0.23***	−0.24***	−0.07***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Total robbery complaints	−0.02**	−0.13***	−0.21***	−0.08***	−0.11***	−0.13***	−0.16***	−0.08***

TABLE 4 ***Continued***

	Model 1				Model 2			
	Neighborhood frisk rate	Minority/white frisk ratio	Neighborhood use of force rate	Minority/white use of force ratio	Neighborhood frisk rate	Minority/white frisk ratio	Neighborhood use of force rate	Minority/white use of force ratio
	(0.01)	(0.01)	(0.02)	(0.01)	(0.01)	(0.01)	(0.02)	(0.01)
Total persons incarcerated	−0.01	−0.00	−0.06***	−0.07***	−0.01*	−0.00	−0.04***	−0.06***
	(0.00)	(0.01)	(0.01)	(0.01)	(0.01)	(0.00)	(0.01)	(0.01)
Proportion Black or Latino	−0.17***	−0.09***	−0.16***	−0.06***	−0.09***	−0.05**	−0.16***	−0.10***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Percent below federal poverty line	0.07***	0.08***	0.13***	0.03	−0.03	−0.05*	0.08**	0.07***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.03)	(0.02)	(0.02)
Affluence concentration	−0.12***	−0.09***	−0.03*	−0.17***	−0.18***	−0.20***	−0.07***	−0.16***
	(0.02)	(0.01)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.01)
Male (0=female)	−0.03	−0.03	−0.03	−0.03	−0.03	−0.03	−0.03	−0.03
	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
Age–standardized, mean centered	0.66***	0.66***	0.66***	0.66***	0.66***	0.66***	0.66***	0.66***
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
High school (ref. less than high school)	−0.37***	−0.37***	−0.37***	−0.37***	−0.38***	−0.38***	−0.37***	−0.37***
	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)
Some college (ref. less than high school)	−0.54***	−0.54***	−0.55***	−0.55***	−0.55***	−0.55***	−0.54***	−0.54***
	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)
College degree (ref. less than high school)	−0.74***	−0.74***	−0.74***	−0.74 ***	−0.74***	−0.74***	−0.74***	−0.74***
	(0.10)	(0.10)	(0.10)	(0.10)	(0.10)	(0.10)	(0.10)	(0.10)
Employed (0=unemployed)	−0.54***	−0.54***	−0.54***	−0.54***	−0.54***	−0.53***	−0.54***	−0.54***
	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
Income 1–2× poverty line	−0.15	−0.15*	−0.15	−0.15	−0.15*	−0.15*	−0.15*	−0.15
	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)
Income 2–4× poverty line	−0.46***	−0.46***	−0.46***	−0.46***	−0.47***	−0.46***	−0.47***	−0.46***
	(0.08)	(0.09)	(0.09)	(0.09)	(0.09)	(0.08)	(0.09)	(0.09)
Income 4–6× poverty line	−0.84***	−0.84***	−0.84***	−0.84***	−0.84***	−0.84***	−0.84***	−0.84***
	(0.09)	(0.09)	(0.09)	(0.09)	(0.09)	(0.09)	(0.09)	(0.09)
Income more than 6×	−1.24***	−1.24***	−1.24***	−1.24***	−1.24***	−1.24***	−1.24***	−1.24***

t4.69	poverty line	(0.09)	(0.09)	(0.09)	(0.09)	(0.09)	(0.09)	(0.09)	(0.09)
t4.70	Don't know income	−0.27**	−0.27**	−0.27**	−0.27**	−0.28**	−0.28**	−0.28**	−0.27**
t4.71		(0.10)	(0.10)	(0.10)	(0.10)	(0.10)	(0.10)	(0.10)	(0.10)
t4.72	Missing poverty data	−0.67***	−0.67***	−0.67***	−0.67***	−0.67***	−0.67***	−0.67***	−0.66***
t4.73		(0.14)	(0.14)	(0.14)	(0.14)	(0.14)	(0.14)	(0.14)	(0.14)
t4.74	US born (0=not US born)	−0.12*	−0.12*	−0.12*	−0.12*	−0.12*	−0.12*	−0.13*	−0.13*
t4.75		(0.06)	(0.05)	(0.05)	(0.06)	(0.05)	(0.06)	(0.06)	(0.06)
t4.76	Insured (0=not insured)	0.20**	0.21**	0.20**	0.21**	0.21**	0.20**	0.21**	0.21**
t4.77		(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.07)
t4.78	Unmet medical care last	0.66***	0.66***	0.66***	0.67***	0.66***	0.67***	0.67***	0.67***
t4.79	year (0=met)	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)
t4.81	Household size–standardized,	−0.06	−0.06	−0.06	−0.06	−0.06	−0.06	−0.06	−0.06
t4.82	median centered	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
t4.84	Formerly married (ref.	0.18**	0.18**	0.18**	0.18**	0.18**	0.18**	0.18**	0.18**
t4.85	married/cohabitating)	(0.06)	(0.06)	(0.06)	(0.05)	(0.06)	(0.06)	(0.06)	(0.06)
t4.87	Never married (ref. Married/	0.13*	0.13*	0.12*	0.13*	0.12*	0.12	0.12*	0.12*
t4.88	cohabitating)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)
t4.90	Primarily spanish at home	0.03	0.03	0.03	0.03	0.05	0.04	0.04	0.03
t4.91	(ref. primarily english)	(0.09)	(0.09)	(0.09)	(0.09)	(0.10)	(0.09)	(0.09)	(0.09)
t4.93	Primarily other language at	0.63***	0.63***	0.63***	0.63***	0.63***	0.63***	0.63***	0.63***
t4.94	home (ref. primarily english)	(0.11)	(0.11)	(0.11)	(0.11)	(0.11)	(0.11)	(0.11)	(0.11)
t4.96	Constant	−0.67***	−0.74***	−0.71***	−0.74***	−0.68***	−0.64***	−0.67***	−0.73***
t4.97		(0.12)	(0.12)	(0.12)	(0.12)	(0.12)	(0.12)	(0.11)	(0.12)
t4.98	Observations	32,452	32,452	32,452	32,452	32,452	32,452	32,452	32,452

t4.99 Higher values indicate more illness, worse health. Weighted logits reported. Standard errors in parentheses. All models include individual- and neighborhood-level controls. See Table 1

t4.100 *$p<0.05$; **$p<0.01$; ***$p<0.001$

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t5.1 **TABLE 5 The effects of invasive police encounters on professionally diagnosed diabetes, average and race-specific effects: 2009–2012 NYC Community Health**
t5.2 **Survey ($N = 32,452$) and 2009–2012 NYC Stop, Question, and Frisk ($N = 34$)**

	Model 1				Model 2			
	Neighborhood frisk rate	Minority/white frisk ratio	Neighborhood use of force rate	Minority/white use of force ratio	Neighborhood frisk rate	Minority/white frisk ratio	Neighborhood use of force rate	Minority/white use of force ratio
Invasive policing measure	0.11***	0.08***	−0.03*	0.15***				
	(0.01)	(0.01)	(0.01)	(0.01)				
White × invasive policing measure					0.15***	−0.05	−0.04	0.22***
					(0.03)	(0.05)	(0.06)	(0.03)
Black × invasive policing measure					−0.06	0.10	−0.09*	0.09***
					(0.07)	(0.07)	(0.04)	(0.03)
Latino × invasive policing measure					0.04	0.24***	0.03	0.13**
					(0.05)	(0.07)	(0.05)	(0.04)
Asian/Pacific Islander × invasive policing measure					0.27***	−0.12	0.03	0.08
					(0.07)	(0.10)	(0.08)	(0.09)
Black non-Latino	0.60***	0.60***	0.59***	0.61***	0.64***	0.63***	0.63***	0.62***
	(0.10)	(0.10)	(0.10)	(0.10)	(0.10)	(0.10)	(0.10)	(0.08)
Latino	0.64***	0.64***	0.64***	0.65***	0.64***	0.67***	0.64***	0.66***
	(0.15)	(0.15)	(0.15)	(0.15)	(0.15)	(0.15)	(0.15)	(0.15)
Asian/Pacific Islander	0.45**	0.46**	0.46**	0.46**	0.40*	0.44**	0.47**	0.50***
	(0.16)	(0.16)	(0.16)	(0.16)	(0.17)	(0.17)	(0.16)	(0.14)
2010	−0.12	−0.12	−0.12	−0.12	−0.12	−0.12	−0.12	−0.12
	(0.09)	(0.09)	(0.09)	(0.09)	(0.09)	(0.09)	(0.09)	(0.09)
2011	−0.00	−0.01	−0.01	−0.01	−0.00	−0.00	−0.01	−0.01
	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)
2012	0.06	0.06	0.06	0.06	0.06	0.06	0.05	0.06
	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)
Community arrest rate	−0.13***	−0.16***	−0.11***	−0.10***	−0.10***	−0.14***	−0.15***	−0.09***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Total robbery complaints	0.08***	−0.00	0.06***	0.08***	0.05***	0.01	0.03*	0.07***

		(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)
	Total persons incarcerated	−0.01	0.03***	−0.08***	−0.03***	0.01	0.04***	−0.11***	−0.02
		(0.00)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
	Proportion Black or Latino	−0.03	0.00	−0.04	0.06*	−0.06*	−0.01	−0.00	0.08**
		(0.02)	(0.03)	(0.02)	(0.03)	(0.03)	(0.02)	(0.03)	(0.03)
	Percent below federal	0.08**	0.25***	0.20***	0.08***	0.25***	0.21***	0.21***	0.08**
	poverty line	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.02)	(0.03)	(0.03)
	Affluence concentration	0.18***	0.26***	0.22***	0.19***	0.28***	0.20***	0.24***	0.20***
		(0.01)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
	Male (0=female)	0.18**	0.18**	0.18**	0.18**	0.18**	0.18**	0.18**	0.18**
		(0.07)	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)
	Age–standardized, mean	0.88***	0.88***	0.88***	0.88***	0.88***	0.88***	0.88***	0.88***
	centered	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
	High school (ref. less than	−0.17	−0.17	−0.17	−0.17	−0.17	−0.17	−0.17	−0.17
	high school)	(0.10)	(0.10)	(0.10)	(0.10)	(0.09)	(0.10)	(0.09)	(0.09)
	Some college (ref. less than	−0.18*	−0.19*	−0.19*	−0.18*	−0.19*	−0.19*	−0.19*	−0.19*
	high school)	(0.09)	(0.09)	(0.09)	(0.09)	(0.09)	(0.09)	(0.09)	(0.09)
	College degree (ref. less than	−0.35***	−0.35***	−0.35***	−0.35***	−0.35***	−0.34***	−0.35***	−0.35***
	high School)	(0.10)	(0.10)	(0.10)	(0.09)	(0.09)	(0.09)	(0.09)	(0.09)
	Employed (0=unemployed)	−0.37***	−0.37***	−0.37***	−0.36***	−0.36***	−0.36***	−0.37***	−0.36***
		(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)
	Income 1–2× poverty line	−0.02	−0.02	−0.02	−0.02	−0.02	−0.03	−0.02	−0.02
		(0.08)	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)
	Income 2–4× poverty line	−0.18*	−0.18*	−0.18*	−0.18*	−0.19*	−0.19*	−0.18*	−0.18*
		(0.09)	(0.09)	(0.09)	(0.09)	(0.09)	(0.09)	(0.09)	(0.09)
	Income 4–6× poverty line	−0.16	−0.15	−0.15	−0.15	−0.16	−0.16	−0.15	−0.15
		(0.15)	(0.15)	(0.15)	(0.15)	(0.15)	(0.15)	(0.15)	(0.14)
	Income more than 6×	−0.36 **	−0.36 **	−0.36 **	−0.35 **	−0.35 **	−0.35 **	−0.35 **	−0.35 **
	poverty line	(0.13)	(0.13)	(0.13)	(0.13)	(0.13)	(0.13)	(0.13)	(0.13)
	Don't know income	−0.19	−0.19	−0.19	−0.19	−0.20	−0.20	−0.19	−0.19
		(0.11)	(0.12)	(0.11)	(0.11)	(0.11)	(0.11)	(0.11)	(0.11)
	Missing poverty data	−0.42**	−0.41**	−0.41**	−0.41**	−0.42**	−0.42**	−0.41**	−0.41**
		(0.13)	(0.13)	(0.13)	(0.13)	(0.13)	(0.13)	(0.13)	(0.13)
	US Born (0=not US born)	−0.01	−0.01	−0.01	−0.01	−0.01	−0.01	−0.01	−0.01
		(0.08)	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)

TABLE 5 ***Continued***

	Model 1				Model 2			
	Neighborhood frisk rate	Minority/white frisk ratio	Neighborhood use of force rate	Minority/white use of force ratio	Neighborhood frisk rate	Minority/white frisk ratio	Neighborhood use of force rate	Minority/white use of force ratio
Insured (0 = not insured)	0.41***	0.41***	0.41***	0.41***	0.40***	0.40***	0.40***	0.41***
	(0.10)	(0.10)	(0.10)	(0.10)	(0.10)	(0.10)	(0.10)	(0.09)
Unmet medical care last year (0 = met)	0.25**	0.25**	0.25**	0.25**	0.25**	0.25**	0.25**	0.25**
	(0.09)	(0.08)	(0.08)	(0.08)	(0.09)	(0.09)	(0.09)	(0.08)
Household size–standardized, median centered	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Formerly married (ref. married/cohabitating)	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11
	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)	(0.06)
Never married (ref. married/cohabitating)	−0.15	−0.15	−0.15	−0.15	−0.15	−0.16	−0.15	−0.15
	(0.09)	(0.09)	(0.09)	(0.09)	(0.09)	(0.09)	(0.09)	(0.09)
Primarily spanish at home (ref. primarily english)	−0.01	−0.01	−0.01	−0.01	0.00	−0.01	−0.02	−0.02
	(0.11)	(0.11)	(0.11)	(0.11)	(0.11)	(0.11)	(0.11)	(0.11)
Primarily other language at home (ref. primarily english)	−0.13	−0.13	−0.12	−0.13	−0.14	−0.13	−0.13	−0.13
	(0.12)	(0.12)	(0.12)	(0.12)	(0.11)	(0.11)	(0.12)	(0.12)
Constant	−2.44***	−2.39***	−2.47***	−2.48***	−2.41***	−2.42***	−2.47***	−2.48***
	(0.18)	(0.18)	(0.18)	(0.18)	(0.18)	(0.18)	(0.17)	(0.14)
Observations	32,452	32,452	32,452	32,452	32,452	32,452	32,452	32,452

Higher values indicate more illness, worse health. Weighted logits reported. Standard errors in parentheses. All models include individual- and neighborhood-level controls. See Table 1.

*$p<0.05$; **$p<0.01$; ***$p<0.001$

Jmle (1524) Art ID 16 Proof # 1 - 15/12/2015

t6.1 **TABLE 6 The effects of invasive police encounters on professionally diagnosed high blood pressure, average and race-specific effects: 2009–2012 NYC**
t6.2 **Community Health Survey (*N* = 32,452) and 2009–2012 NYC Stop, Question, and Frisk (*N* = 34)**

t6.3		Model 1				Model 2			
t6.4		Neighborhood frisk rate	Minority/white frisk ratio	Neighborhood use of force rate	Minority/white use of force ratio	Neighborhood frisk rate	Minority/white frisk ratio	Neighborhood use of force rate	Minority/white use of force ratio
t6.6	Invasive Policing Measure	0.16***	−0.01	−0.01*	0.09***				
t6.7		(0.01)	(0.01)	(0.01)	(0.01)				
t6.8	White × invasive policing measure					0.10***	−0.08**	−0.05	0.05*
t6.10						(0.03)	(0.03)	(0.03)	(0.02)
t6.11	Black × invasive policing measure					0.05	0.13 *	0.04	−0.01
t6.13						(0.04)	(0.05)	(0.03)	(0.03)
t6.14	Latino × invasive policing measure					0.21***	0.04	0.17***	0.13***
t6.16						(0.03)	(0.04)	(0.03)	(0.03)
t6.17	Asian/Pacific Islander × invasive policing measure					0.17*	−0.12	0.17**	0.01
t6.19						(0.07)	(0.08)	(0.05)	(0.08)
t6.20	Black non-Latino	0.68***	0.69***	0.69***	0.69***	0.73***	0.66***	0.72***	0.68***
t6.21		(0.07)	(0.07)	(0.07)	(0.07)	(0.08)	(0.07)	(0.07)	(0.07)
t6.22	Latino	0.33***	0.33***	0.33***	0.33***	0.32***	0.34***	0.34***	0.34***
t6.23		(0.08)	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)	(0.07)	(0.08)
t6.24	Asian/Pacific Islander	0.17	0.16	0.16	0.17	0.18	0.15	0.19	0.19
t6.25		(0.12)	(0.12)	(0.12)	(0.12)	(0.13)	(0.12)	(0.11)	(0.12)
t6.26	2010	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
t6.27		(0.07)	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)
t6.28	2011	0.02	0.02	0.02	0.02	0.02	0.03	0.02	0.02
t6.29		(0.08)	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)
t6.30	2012	−0.01	−0.01	−0.01	−0.01	−0.01	−0.01	−0.01	−0.01
t6.31		(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)
t6.32	Community arrest rate	−0.05***	−0.12***	−0.15***	−0.05***	−0.08***	−0.14***	−0.12***	−0.10***
t6.33		(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
t6.34	Total robbery complaints	0.04***	−0.05***	−0.02**	0.02**	−0.00	−0.05***	0.01	−0.02*

Q1

t6.36 **TABLE 6** ***Continued***

	Model 1				Model 2			
	Neighborhood frisk rate	Minority/white frisk ratio	Neighborhood use of force rate	Minority/white use of force ratio	Neighborhood frisk rate	Minority/white frisk ratio	Neighborhood use of force rate	Minority/white use of force ratio
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Total persons incarcerated	−0.11***	−0.05***	−0.08***	−0.07***	−0.12***	−0.07***	−0.11***	−0.10***
	(0.01)	(0.00)	(0.00)	(0.01)	(0.01)	(0.00)	(0.01)	(0.01)
Proportion Black or Latino	0.00	0.06***	0.09***	0.04*	−0.01	0.06***	0.03	0.06***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Percent below federal poverty line	−0.08***	−0.02	−0.13***	0.07***	−0.09***	−0.06***	0.03	−0.03*
	(0.01)	(0.01)	(0.01)	(0.02)	(0.02)	(0.01)	(0.02)	(0.01)
Affluence concentration	−0.05***	0.05***	−0.07***	0.06***	−0.06***	0.01	0.07***	−0.01
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Male (0=female)	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09
	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)
Age–standardized, mean centered	1.08***	1.08***	1.08***	1.08***	1.08***	1.08***	1.09***	1.08***
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
High school (ref. less than high school)	−0.16**	−0.16**	−0.16**	−0.16**	−0.16**	−0.16**	−0.16**	−0.16**
	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
Some college (ref. less than high school)	−0.16*	−0.16*	−0.16*	−0.16*	−0.16*	−0.17*	−0.16*	−0.17*
	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)
College degree (ref. less than high school)	−0.31***	−0.31***	−0.30***	−0.31***	−0.31***	−0.31***	−0.31***	−0.31***
	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)
Employed (0=unemployed)	−0.17***	−0.17***	−0.17***	−0.17***	−0.17***	−0.17***	−0.17***	−0.17***
	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
Income 1–2× poverty line	0.08	0.08	0.08	0.08	0.09	0.08	0.09	0.08
	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)
Income 2–4× poverty line	−0.06	−0.06	−0.06	−0.06	−0.05	−0.06	−0.05	−0.06
	(0.09)	(0.09)	(0.09)	(0.09)	(0.09)	(0.09)	(0.09)	(0.09)
Income 4–6× poverty line	−0.08	−0.09	−0.09	−0.09	−0.08	−0.08	−0.08	−0.08
	(0.11)	(0.11)	(0.11)	(0.11)	(0.11)	(0.11)	(0.11)	(0.11)
Income more than 6×	−0.26**	−0.26**	−0.26**	−0.26**	−0.25**	−0.25**	−0.25**	−0.26**

t6.69	poverty line	(0.09)	(0.09)	(0.09)	(0.09)	(0.09)	(0.09)	(0.09)	(0.09)
t6.70	Don't Know Income	−0.11	−0.11	−0.11	−0.11	−0.11	−0.11	−0.11	−0.11
t6.71		(0.11)	(0.11)	(0.11)	(0.11)	(0.11)	(0.11)	(0.11)	(0.11)
t6.72	Missing poverty data	−0.27**	−0.28**	−0.28**	−0.28**	−0.27**	−0.28**	−0.27**	−0.27**
t6.73		(0.10)	(0.10)	(0.10)	(0.10)	(0.10)	(0.10)	(0.10)	(0.10)
t6.74	US born (0=not US born)	0.03	0.02	0.02	0.03	0.03	0.02	0.03	0.03
t6.75		(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
t6.76	Insured (0=not insured)	0.45***	0.46***	0.45***	0.46***	0.45***	0.45***	0.45***	0.46***
t6.77		(0.08)	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)
t6.78	Unmet medical care last	0.34***	0.34***	0.34***	0.34***	0.34***	0.34***	0.34***	0.34***
t6.80	year (0=met)	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)
t6.81	Household size–standardized,	−0.03	−0.03	−0.03	−0.03	−0.03	−0.03	−0.03	−0.03
t6.83	median centered	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
t6.84	Formerly married (ref.	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
t6.86	married/cohabitating)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)
t6.87	Never married (ref. married/	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
t6.89	cohabitating)	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)
t6.90	Primarily spanish at home	0.01	0.01	0.01	0.01	−0.01	0.01	−0.01	−0.01
t6.92	(ref. primarily english)	(0.09)	(0.09)	(0.09)	(0.09)	(0.09)	(0.09)	(0.09)	(0.09)
t6.93	Primarily other language	−0.02	−0.02	−0.02	−0.03	−0.02	−0.02	−0.03	−0.02
t6.96	at home (ref. primarily	(0.09)	(0.09)	(0.09)	(0.09)	(0.09)	(0.09)	(0.09)	(0.09)
t6.95	english)								
t6.97	Constant	−1.08***	−1.11***	−1.13***	1.14***	−1.12***	−1.12***	−1.11***	−1.16***
t6.98		(0.14)	(0.14)	(0.14)	(0.14)	(0.14)	(0.14)	(0.13)	(0.14)
t6.99	Observations	32,452	32,452	32,452	32,452	32,452	32,452	32,452	32,452

t6.100 Higher values indicate more illness, worse health. Logits reported. Standard errors in parentheses. All models include individual- and neighborhood-level controls. See Table 1.
t6.101 *$p<0.05$; **$p<0.01$; ***$p<0.001$

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