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Neighborhood Environment, Racial Position, and Risk of Police-Reported Domestic Violence: A Contextual Analysis

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SYNOPSIS

Objectives. The purpose of this study was to examine the contribution of neighborhood socioeconomic conditions to risk of police-reported domestic violence in relation to victim's race. Data on race came from police forms legally mandated for the reporting of domestic violence and sexual assault.

Methods. Using 1990 U.S. census block group data and data for the years 1996–1998 from Rhode Island's domestic violence surveillance system, the authors generated annual and relative risk of police-reported domestic violence and estimates of trends stratified by age, race (black, Hispanic, or white), and neighborhood measures of socioeconomic conditions. Race-specific linear regression models were constructed with average annual risk of police-reported domestic violence as the dependent variable.

Results. Across all levels of neighborhood poverty (<5% to 100% of residents living below the federal poverty level), the risk of police-reported domestic violence was higher for Hispanic and black women than for white women. Results from the linear regression models varied by race. For black women, living in a census block group in which fewer than 10% of adults ages ≥25 years were college-educated contributed independently to risk of police-reported domestic violence. Block group measures of relative poverty (≥20% of residents living below 200% of the poverty line) and unemployment (≥10% of adults ages ≥16 years in the labor force but unemployed) did not add to this excess. For Hispanic women, three neighborhood-level measures were significant: percentage of residents living in relative poverty, percentage of residents without college degrees, and percentage of households monolingual in Spanish. A higher degree of linguistic isolation, as defined by the percentage of monolingual Spanish households, decreased risk among the most isolated block groups for Hispanic women. For white women, neighborhood-level measures of poverty, unemployment, and education were significant determinants of police-reported domestic violence.

Conclusion. When data on neighborhood conditions at the block group level and their interaction with individual racial position are linked to population-based surveillance systems, domestic violence intervention and prevention efforts can be improved.

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Violence against women is now widely recognized as a major public health issue worldwide,¹⁻³ but surveillance systems to track incidence, prevalence, and trends are just beginning to be established. In the United States, some states now collect information on frequency of domestic violence incidents and the specific circumstances surrounding the violence, for example, location of incident and alcohol or drug involvement.⁴ A number of researchers have investigated the limitations and strengths of existing databases for surveillance of violence against women.⁴⁻⁷ About half of all intimate partner violence toward women is not reported to the police.^{8,9} Thus surveillance systems that rely on police incident reports underestimate the prevalence of domestic violence. For many communities, however, police data provide the only readily available and routinely collected information about interpersonal violence toward women.^{10,11}

The purpose of the present study was to estimate statewide cumulative incidence of police-reported domestic violence toward women in relation to neighborhood socioeconomic characteristics and victims' race. Data on race came from police forms legally mandated for the reporting of domestic violence and sexual assault. While the association between neighborhood socioeconomic characteristics and health outcomes is well known,¹²⁻¹⁴ few studies have explored whether neighborhood-level factors are related to domestic violence.^{10,15-17}

An ecological analysis of police-reported intimate partner violence by Miles-Doan and Kelly using census tract data for Duval County, Florida, found that interpersonal violence was highest in concentrated poverty neighborhoods.¹⁰ O'Campo and colleagues examined the risk of violence by male partners toward women during the childbearing years using census tract data for Baltimore, Maryland.¹⁶ Their study found that living in census tracts with the lowest percentile of per capita income (<\$8,000/year) and living in census tracts with high unemployment ($\geq 12\%$) significantly increased the risk for interpersonal physical violence independent of individual-level factors such as income. On the other hand, white women were nine times as likely as African American women to report partner violence, independent of census tracts measures of per capita income and unemployment rates, but the findings were based on small numbers of white women. A recent study by Cunradi and colleagues, based on 1995 National Alcohol Survey data appended to the 1990 U.S. Census, found that residence in an impoverished area ($\geq 20\%$ of the population lived below the federal poverty line) increased the risk of male-to-

female partner violence for black couples but not for white and Hispanic couples.¹⁷

Ways in which one conceptualizes race have important implications for understanding disparities in domestic violence rates. "Race" is a latent variable of great social and economic complexity in meaning and lived experience. Although racial identity can be a source of great pride and support, it is also a marker for exposure to systematic social prejudice and economic discrimination.¹⁸ In the present study, we were specifically interested in looking at "race" as a marker for relative social and economic advantage based on strong evidence from U.S. Census data¹⁹ and from extensive research on race and health in the United States suggesting that experiences of non-economic forms of racial discrimination affect education, disposable income, wealth, assets, stability of employment, and health across the life course,²⁰⁻²³ even among people living in neighborhoods with similar socioeconomic characteristics.²⁴⁻²⁶ Throughout this report, we use the term *race* or *racial position* to refer to exposure to cumulative experiences of stereotyping (which we did not measure) that hamper or give privilege to what is achievable for individuals and their neighborhoods. Even though the U.S. Census does not designate Hispanics as a race, Hispanics are one of only four commonly recognized minority groups in the U.S. population, which include blacks, Hispanics, Native Americans, and Asian/Pacific Islanders.²² Because these categories are socially constructed and designate populations that are disadvantaged relative to the majority,^{22,23} this article treats all four groups as "races."

METHODS

Study sample

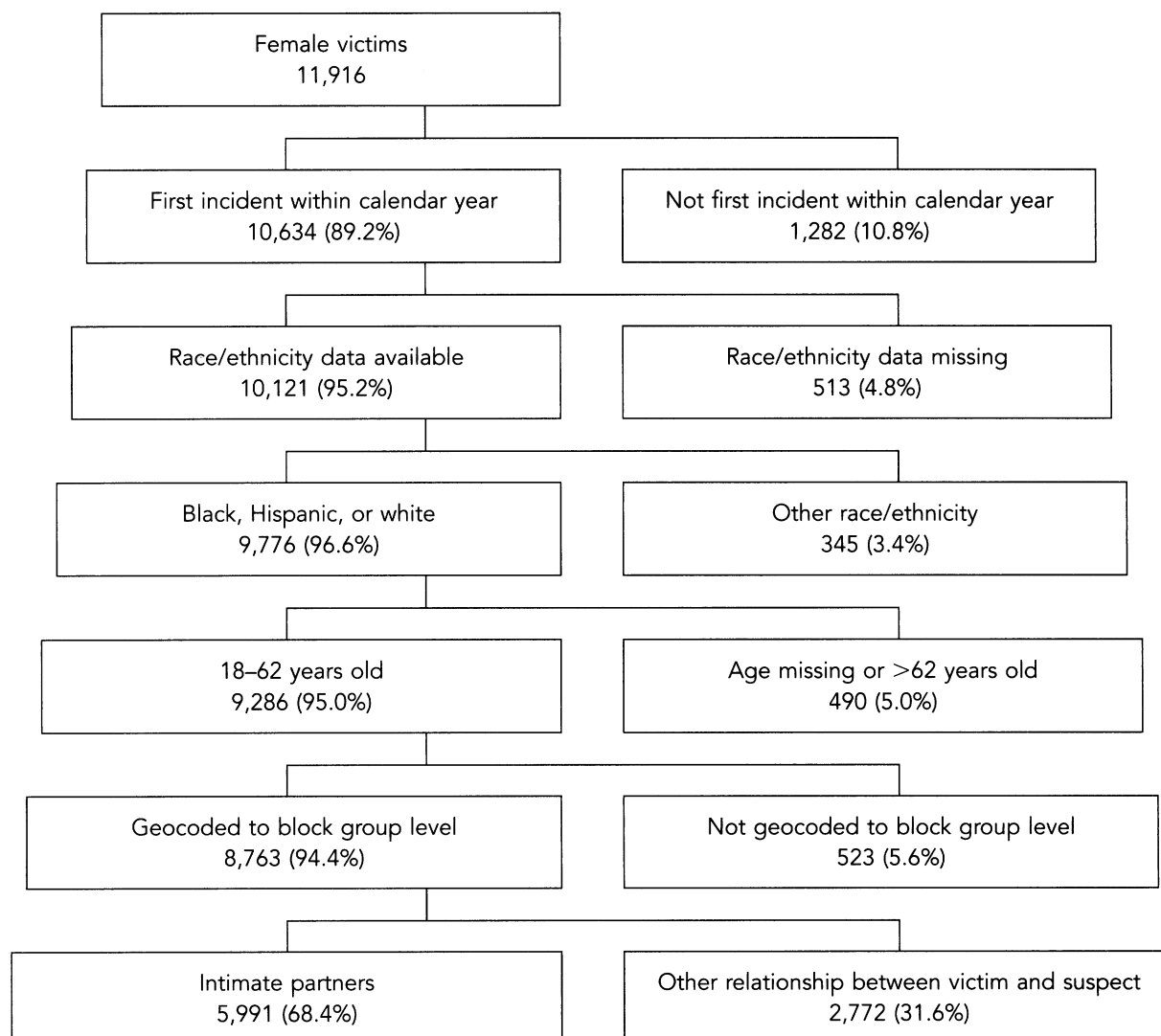
The study base consisted of all 413,292 women ages 18 and older included in the 1990 U.S. Census as residents of Rhode Island.¹⁹ Rhode Island surveillance system data came from an incident-based police reporting form for domestic violence and sexual assault called the DV/SA.²⁷ By law, police are required to report domestic violence incidents, whether or not the assault results in injury, and to arrest the perpetrator. From January 1, 1996, through December 31, 1998, the Rhode Island Violence Against Women Public Health Surveillance system (VAWPHS) documented 14,700 incidents of violence victimization, representing 11,916 incidents involving women (81.1%), 2,578 involving men (17.5%), and 206 incidents in which the victim's gender was not known (1.4%). Each incident-based police form represents one domestic

violence case. We assumed that all in-state domestic violence reports obtained from the surveillance system originated from the Census population.

Figure 1 displays the selection criteria for the study sample. We restricted analyses to the first domestic violence incident in the same calendar year for a given individual because multiple victimization reports were less systematically included in the surveillance database. We also restricted analyses to women identified in the VAWPHS system as black, Hispanic, or white and as 18–62 years of age because the majority (9,286/11,916) of police reports were filed on women with these characteristics. Data on racial position were missing for about 5% ($n = 513$) of reports involving women. Nearly 85% of these police reports with missing infor-

mation on race were filed in 1996; race was not a required field on the 1996 incident-based police form. These 513 women resided in census block groups with comparable socioeconomic characteristics to the block groups in which women with data on racial position resided. Since there was no difference in block group characteristics between women with and without information on race, we present all three years of data. The final sample thus consisted of 8,763 domestic violence cases geocoded to the U.S. census block group level (Figure 1). Block groups define neighborhoods that are more economically homogeneous (average population = 1,000) than neighborhoods defined at the census tract level (average population = 4,000).

Figure 1. Sample characteristics



Measures

Domestic violence. For the present study, a domestic violence incident was defined as a physical or sexual assault, or threat of assault, by an intimate partner, family member, or cohabitant ages 18 years or older. The definition used by the surveillance system also includes sexual assaults perpetrated by friends, acquaintances, and strangers, but these incidents were not included in the present data analysis.

Race. In the 1990 U.S. Census, racial/ethnic classification was based on self-report. Respondents categorized as "black of Hispanic origin" or "white of Hispanic origin" were coded as Hispanic for the present study. The DV/SA police form had seven categories for race/ethnicity: (1) white, (2) black, (3) white, Hispanic, (4) black, Hispanic, (5) Asian, (6) Native American, and (7) other.

Age. Age, defined as years since birth, was categorized for this study according to known age-related violence risk patterns: 18–29, 30–39, and 40–62 years. We present findings first for ages 18–62 and then specifically for women ages 18–29 since recent domestic violence is more prevalent among women younger than 30 years of age than among women ages 30 and older.²⁸

Census block group socioeconomic measures. Census block group data publicly available in Summary Tape File 3A for the 1990 U.S. census contained multiple indicators for small-area socioeconomic conditions.¹⁹ In 1990, Rhode Island contained 882 block groups with a mean population size of 1,137 people (standard error = 670; median = 1,025).

Using the Census data, we constructed several measures of neighborhood socioeconomic conditions. Rates of police-reported domestic violence were analyzed in relation to five variables that captured aspects of neighborhood social class: poverty, education, unemployment, concentration of white residents in poverty areas, and linguistic isolation. Empirical support for these variables is found in the literature on Census data methodology,^{12,13} in published studies that analyzed neighborhood-level characteristics in relation to interpersonal violence,^{10,16–17} and in a theoretical model of family violence that locates the sources of domestic violence at the individual, situational, environmental, and ideological levels of explanation.²⁹

We theorized that: (a) Concentration of poverty provides information on the neighborhood tax base for important services and resources, on housing stock, and on public safety. (b) Concentration of college graduates provides information on skills, prestige, and opportunities to access resources. (c) Concentration

of unemployment, while a strong correlate of concentration of poverty, captures both material deprivation and social deprivation (e.g., absence of co-worker comradeship and less possibility of feeling a part of a larger purpose, whether to feed and care for family or to promote team playing in the workplace). (d) Linguistic isolation captures another dimension of social experience that reflects factors such as recent immigration, access to English-only services and resources, isolation from mainstream dominant culture and norms, and fear of deportation if identified.

Absolute poverty was measured as the percentage of people living below the federal poverty line, which was set at \$12,674 for a family of four in the 1990 Census; according to federal guidelines, a "poverty area" is one in which 20% or more of residents live below the poverty line.¹⁹ Relative poverty was defined as the percentage of people living below 200% of the poverty threshold. Education was calculated as the percentage of the block group's population ages 25 years and older that had completed at least four years of college. The percentage of the population ages 16 years and older that was in the labor force but reported being unemployed was used to measure block group unemployment. Linguistic isolation was defined by the percentage of monolingual Spanish-speaking households in a block group. Block-groups in which at least two-thirds of the residents were white served as a proxy for greater social and economic resources than would be found in other block groups. In Rhode Island in 1990, black women were more than 5 times as likely as white women (55.8% vs. 9.5%) to be living in the poorest neighborhoods ($\geq 20\%$ of residents living below poverty).

Statistical analysis

Constructing numerators and denominators of block group socioeconomic measures. Numerators consisted of geocoded police-reported cases linked to selected block group measures characterizing socioeconomic conditions. For each calendar year, we tallied the number of first domestic violence cases stratified by race (black, Hispanic, white) and age (18–29, 30–39, 40–62) for block groups with the specified socioeconomic condition (e.g., the number of white women ages 18–29 in block groups where 20% or more of the residents lived in households with incomes below the poverty line).

Denominators of cumulative incidence reflected the combined number of people for calendar years 1996–1998 living in block groups sharing a particular economic condition in the 1990 Census. Block-group

population counts were directly available for Hispanic women from Summary Tape File 3A.¹⁹ Counts of black and white women in the 1990 Census included women of Hispanic ethnicity; thus, to estimate the number of non-Hispanic black and white women we first calculated the proportion of black and white women of non-Hispanic origin for each block group using Census data and then multiplied these proportions by each group's age distribution within the block group. We then summed across all block groups within the same economic stratum to obtain denominator data stratified by race, age, and block group socioeconomic position (measures pertaining to poverty, education, unemployment, and concentration of white residents).

Calculating average annual risk, relative risk, and estimates of trends. To estimate the average annual risk of police-reported domestic violence for all women in our sample, we divided the total number of domestic violence cases by three, the number of surveillance years, divided by the 1990 population and multiplied by 100,000. This procedure estimated the annual average risk per 100,000 women. All comparisons were age- and race-specific. Estimates of relative risk were constructed as ratios of violence risk across categories of economic well-being.

For estimates of trends, we computed the excess number of annual cases per unit change in social class gradient using least squares linear regression to derive estimates of age- and race-specific beta coefficients to evaluate the hypothesis of increasing domestic violence cases in relation to increasing neighborhood deprivation. We also present graphic displays of the average annual risk of police-reported domestic violence as a function of neighborhood characteristics, using figures with untransformed scales.³⁰

Overall and race-specific linear regression models were constructed with average annual risk of police-reported domestic violence as the dependent variable and terms for percentage of the population at 200% or less of the poverty line (with <5% concentration as referent), percentage of the population age 25 years and older that had a college education (with 25%–100% as referent), percentage of the population age 16 years and older that reported being in the labor force but unemployed (with <5% unemployed as referent), and for Hispanic women, an additional set of terms for linguistic isolation (with 0% isolation as referent). All statistical analyses were done using SAS software.³¹

RESULTS

Among all victims of police-reported domestic violence in 1996–1998 ($n = 11,916$), about 1 in 5 were black or Hispanic and 43.3% were ages 18–29 years. (See Table 1.) Statewide, fewer than 7% of adult women ages ≥ 18 years were black or Hispanic, and only one-quarter (24.7%) were <30 years old.

We estimated the average annual incidence of police-reported domestic violence over a three-year period for 18- to 62-year-old black, Hispanic, and white women ($n = 8,763$). The denominator consisted of women who met these same age and race criteria in the 1990 Rhode Island Census ($[8,763/3]/295,813 \times 100,000$). An estimated 1% of black, Hispanic, or white 18- to 62-year-old women in Rhode Island reported at least one domestic violence incident to the police within a calendar year (987 cases per 100,000 women). Male-to-female intimate partner violence, a subset of sexual assault and domestic violence incidents reported to the police, was slightly lower (0.7% of black, Hispanic, or white women ages 18–62 years).

Estimates for risk of domestic violence showed a trend of increasing police reports with decreasing neighborhood economic resources (Figure 2). Police-reported domestic violence occurred nearly 2.5 times as often in block groups defined as “poverty areas” ($\geq 20\%$ of people living below federal poverty guidelines) as in wealthier areas ($< 5\%$ of people living below poverty). Women living in areas of relative poverty ($\geq 20\%$ of people lived below twice the federal poverty line) experienced violence in their home nearly 3.5 times as often as female residents of the least poor block groups (Table 2). Similar patterns were evident for comparisons of block groups with low and high concentrations of college graduates and for block groups with low and high unemployment.

Women ages 18–29. Figures 3–5 present trends in average annual risk of police-reported domestic violence across racial subgroups for women ages 18–29, the age group typically at greatest risk.²⁸ Monotonic patterns were most evident and consistent for white women. For only one block group measure, neighborhood-level education, was greater status and economic potential, in this case as measured by a higher percentage of college graduates, inversely related to risk of police-reported violence for all racial groups.

Using white women as the reference group, we estimated racial differences in risk for police-reported domestic violence by levels of neighborhood poverty for 18- to 29-year-old women, the highest risk group. In all concentrations of poverty, ranging from <5% to 100% of block group residents living below the pov-

Table 1. Distribution of 3-year cumulative cases of police reports of violence against women in the Rhode Island Violence Against Women Public Health Surveillance system, 1996–1998, compared with study sample and 1990 Rhode Island population data

Variable	Police reports of domestic violence/sexual assault involving adult female victims		Study sample ^a		Women ≥18 years of age, Rhode Island, 1990 ^b	
	Number	Percent	Number	Percent	Number	Percent
Total	11,916	100.0	8,763	100.0	413,292	100.0
Racial category						
Black	1,021	8.6	800	9.1	11,623	2.8
Hispanic	1,059	8.9	873	10.0	15,785	3.8
White	8,917	74.8	7,090	80.9	375,760	90.9
Other	367	3.1			10,124	2.5
Unknown	552	4.6				
Age (years)						
18–29	5,159	43.3	3,970	45.3	102,233	24.7
30–39	3,992	33.5	3,067	35.0	84,510	20.5
40–62	2,173	18.2	1,726	19.7	118,177	28.6
≥63	194	1.6			108,372	26.2
Unknown	398	3.3				
Number of police reports per calendar year involving same victim						
1	10,634	89.2				
2	1,047	8.8				
3–11	229	1.9				
Unknown	6	0.1				

^aSample limited to women 18–62 years of age recorded by police as black, Hispanic, or white and geocoded to block group level.

^bSource of data: Reference 19.

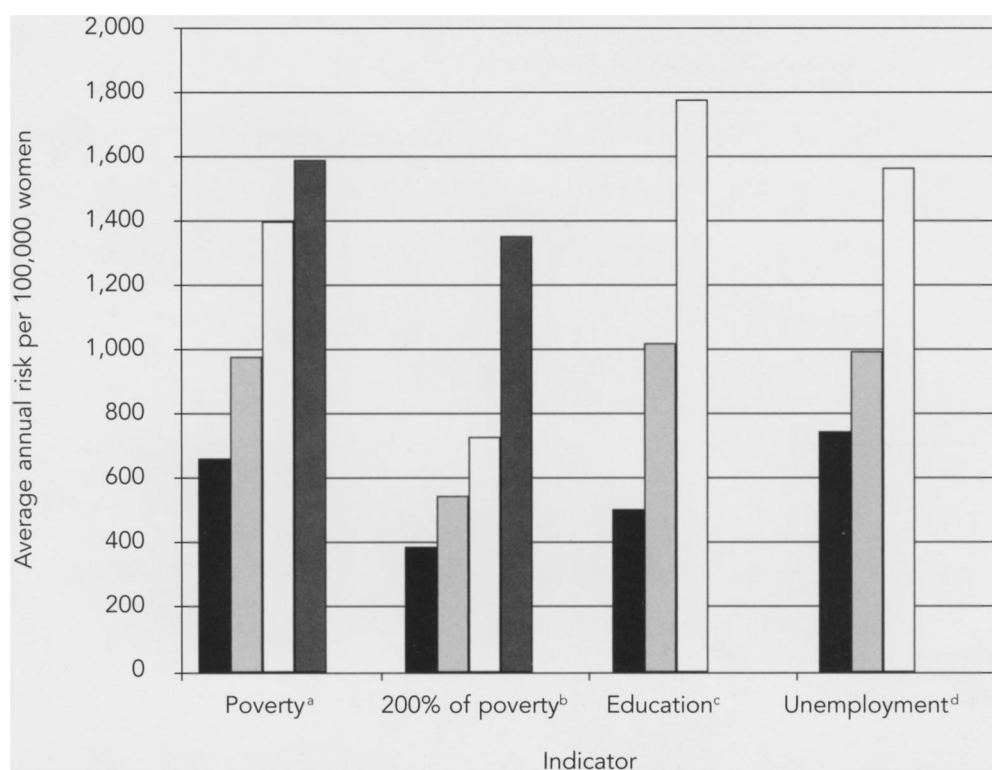
erty level, both black and Hispanic women showed significantly higher risks of police-reported domestic violence relative to white women (not shown). For Hispanic women, this ranged from twice the risk in block groups of greatest poverty to four times the risk in block groups of least poverty, and for black women from twice the risk in the most impoverished block groups to six times the risk in the least impoverished block groups.

Combined impact of individual- and neighborhood-level factors on police-reported domestic violence. The combined effect of poverty, residential concentration of whites, and victim's racial position on risk of police-reported domestic violence is shown in Table 3. We focus here on all age categories to maximize information for estimating race-specific violence risk among women living in poor neighborhoods that vary in concentrations of white residents. Black, Hispanic, and white women were less likely to have been police-documented victims of violence in block groups with fewer than a

third white residents relative to block groups with more than a third white residents. Among black and Hispanic women living in the poorest block groups in the state, the risk of violence victimization was nearly three times as high for those living in relatively white block groups, compared to those living in block groups with less than a third white residents. For white women living in the poorest block groups in the state, the risk was 1.6 times as high for those living in relatively white areas, compared to those living in block groups with relatively few white residents.

Linear regression model for analysis of neighborhood-level factors. In the linear regression model for all women, there were steep gradients of increasing police reports with increasing neighborhood poverty (percent of residents below 200% of the poverty line), unemployment, and proportions of residents without college degrees (not shown). These factors contributed independently to risk of police-reported domestic violence, with an average excess of 518 women per 100,000 in the poor-

Figure 2. Estimates of risk for and trends in police-reported domestic violence by neighborhood indicators of socioeconomic position, Rhode Island, 1996–1998



^aPercent of residents of census block group living in households with incomes below federal poverty level (<5%, 5%–9.9%, 10%–19.9%, 20%–100%).

^bPercent of residents of census block group living in households with income <200% of federal poverty level (<5%, 5%–9.9%, 10%–19.9%, 20%–100%).

^cPercent of residents of census block group ages ≥25 years who have four or more years of college (25%–100%, 10%–24.5%, <10%).

^dPercent of residents of census block group ages ≥16 years who are in the labor force and unemployed (<5%, 5%–9.9%, 10%–100%).

est block groups relative to the least poor (95% confidence interval [CI] 264/100,000, 776/100,000) and an excess of 194 women per 100,000 in block groups with at least 10% of people ages ≥16 years in the labor force who reported being unemployed (95% CI 32/100,000, 359/100,000). In the same model, higher concentrations of college graduates mitigated this excess of police-reported cases of domestic violence, with a reduction of 813 women per 100,000 if at least 25% of residents ages ≥25 years were college graduates relative to fewer than 10% at this level of education (95% CI –983/100,000, –646/100,000).

Regression results using the same terms as the overall model were markedly different for black women. In analyses controlling for relative poverty (percent of residents living below 200% of the poverty line) and

unemployment, black women living in block groups in which fewer than 10% of residents ages ≥25 years were college educated had an excess of 2,055 cases of police-reported domestic violence per 100,000 women relative to black women living in block groups in which at least 25% of residents ages ≥25 years were college educated (95% CI 1,011/100,000, 3,115/100,000). Neither relative poverty nor unemployment added to this excess, although in crude race-specific analyses, both factors were strongly associated with police reports of domestic violence.

Hispanic women showed similar patterns to black women; block groups with the lowest percentage of college graduates accounted for the largest excess of police-reported domestic violence. Unlike the results for black women, living in block groups in which ≥20%

Table 2. Estimates of relative risk and excess number of cases of police-reported domestic violence in relation to neighborhood indicators of socioeconomic position, Rhode Island, 1996–1998

<i>Block group characteristics</i>	<i>Study sample (N = 8,763) Number</i>	<i>Black, Hispanic, and white women ages 18–62 in Rhode Island, 1990 (n = 295,813)^a Number</i>	<i>Average annual risk^b</i>	<i>Estimated RR^c (95% CI)</i>	<i>Estimate of excess number of annual cases per 100,000 women per unit change in socioeconomic gradient^d (95% CI)</i>
Percent of residents living below federal poverty line				2.43 (2.29, 2.57)	322 (261, 383)
<5	2,444	124,578	654		
5–9.9	2,528	86,164	978		
10–19.9	1,913	45,644	1,397		
20–100	1,878	39,427	1,588		
Percent of residents living below 200% of federal poverty line				3.47 (3.00, 4.02)	963 (849, 1,077)
<5	154	13,203	389		
5–9.9	601	36,979	542		
10–19.9	2,248	103,614	723		
20–100	5,760	142,017	1,352		
Percent of college graduates among adults ≥25 years of age				3.55 (3.36, 3.76)	634 (503, 763)
25–100	1,537	103,178	497		
10–24.9	4,026	132,158	1,015		
<10	3,200	60,477	1,764		
Percent unemployed among residents ages ≥16 years in the labor force				2.12 (2.01, 2.24)	412 (234, 591)
<5	2,557	115,432	738		
5–9.9	3,927	131,785	993		
10–100	2,279	48,596	1,563		

^aSource of data: Reference 19.^bMean number of cases per 100,000 women.^cRisk at level of greatest socioeconomic deprivation relative to risk at level of greatest socioeconomic well-being.^dBeta coefficient for linear trend.

RR = relative risk

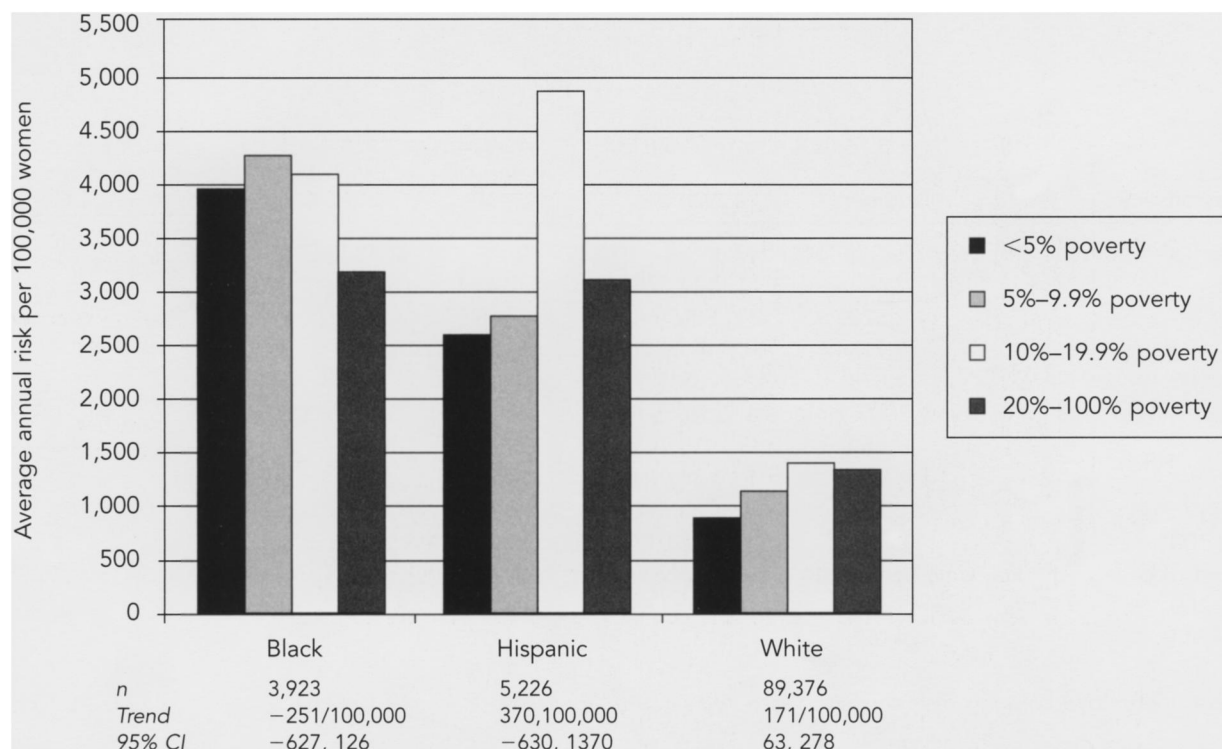
CI = confidence interval

of residents lived at <200% of the poverty line was still associated with excess cases (1,333/100,000; 95% CI –60/100,000, 2,748/100,000) relative to block groups in which fewer than 5% of residents lived below 200% of the poverty line. Furthermore, when linguistic isolation was added to this model, the other coefficients for block group characteristics changed very little. At the same time, linguistic isolation itself, in analyses controlling for all other socioeconomic measures, accounted for a decrease of 2,302 cases per 100,000 women (95% CI –4,167/100,000, –408/100,000) in block groups where ≥15% of household were monolingual in Spanish, compared with the reference areas (0% of households monolingual in Spanish).

DISCUSSION

This is the first study to examine police-reported domestic violence in relation to both census block group measures of neighborhood socioeconomic conditions and racial position. We estimated that 1% of 18- to 62-year-old women in Rhode Island reported at least one domestic violence incident to the police within a calendar year. The estimated rate of police-reported intimate partner violence was slightly lower (0.7% of women). Our estimate of police-reported domestic violence in Rhode Island is comparable to two national estimates of intimate partner violence. Data from the 1995–1996 National Violence Against Women (NVAW) reveal that an estimated 1.5% of surveyed women ages 18 and older had been assaulted by an

Figure 3. Estimates of risk for and trends in police-reported domestic violence by poverty rate and racial position among black, Hispanic, and white Rhode Island women ages 18–29 years, 1996–1998



NOTE: The poverty rate is the percent of residents of a census block group living in households with incomes below the federal poverty level.

Trend = beta coefficient for linear trend

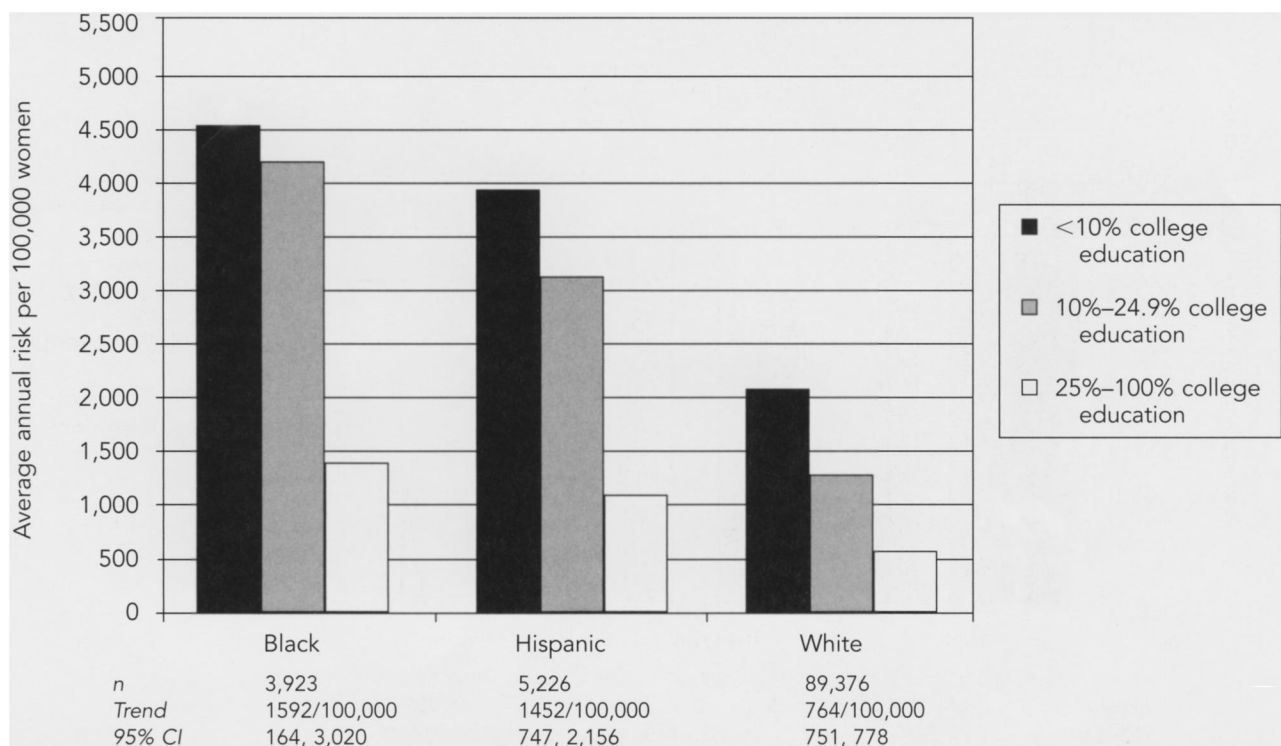
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intimate partner in the previous 12 months.³² The intimate partner violence rate in the National Crime Victimization Survey (NCVS) was 0.7 per 100,000 women ages 12 and older, with higher rates reported among women who were young, black, not currently married, earning lower incomes, living in rental housing, or living in urban areas.⁹ Estimates of intimate partner violence among married or cohabiting couples ages 18 or older in the 1995 National Alcohol Survey are higher than those reported in the NVAW and NCVS. A lower-bound rate of 5.21% and an upper-bound rate of 13.61% were reported for male-to-female partner violence.³³ Our findings are consistent with regional estimates for police-reported violence between intimates from a 1984 Atlanta, Georgia, study¹¹ and a 1992 Duval County, Florida, study.¹⁰ The ages of victims or perpetrators were not reported in either study. In both, nonfatal family and intimate partner violence include male and female victims. In 1984, the rate of

nonfatal family and intimate partner violence among male and female victims was estimated at 0.8% for Atlanta, Georgia.¹¹ The 1992 median rate of family and intimate partner violence among victims living in concentrated poverty census tracts in Duval County, Florida, was estimated at 1.08%.¹⁰ The largest proportion of victims in Duval County were female (77%).¹⁰

Our finding that the risk of police-reported domestic violence was highest for 18- to 62-year-old women living in the poorest block groups is consistent with the findings of previous research examining the association between poverty measured at the census tract level and risk of domestic violence. An earlier study found that living in census tracts with the lowest percentile of per capita income increased the risk of partner-perpetuated violence to more than four times the risk associated with living in census tracts with the highest percentile per capita income.¹⁶ Another study found that women residing in concentrated poverty

Figure 4. Estimates of risk for and trends in police-reported domestic violence by college education rate and racial position among black, Hispanic, and white Rhode Island women ages 18–29 years, 1996–1998



NOTE: The college education rate is the percent of residents of a census block group ages ≥ 25 who have had four or more years of college.

Trend = beta coefficient for linear trend

CI = confidence interval

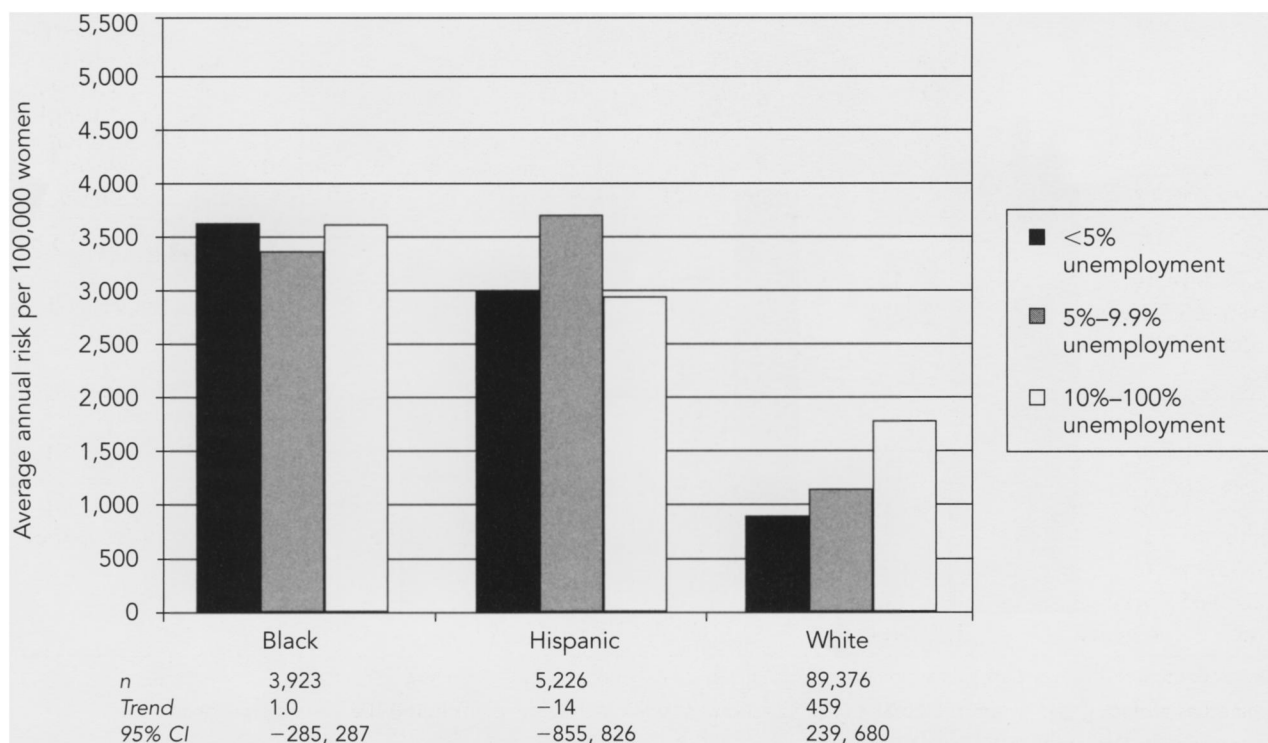
tracts (in which the percentages of neighborhood residents who were on public assistance, in female-headed households, and, for working-age men, unemployed were more than twice the median in the 1990 U.S. Census) had rates of police-reported intimate partner violence that were nine times as high as those of residents living in non-poverty census tracts.¹⁰ Although many of our findings confirm those of other studies in the domestic violence literature, other results provide new insights about domestic violence risk.

The present study is the first contextual analysis of police-reported domestic violence to document how neighborhood socioeconomic conditions interact with individual-level racial position, with alarming differences in the relative risk of victimization for Hispanic and black women relative to white women. Among women ages 18 to 29, police reports documenting domestic violence victimization were three to five times as high in the least impoverished neighborhoods and

twice as high in the most impoverished neighborhoods for black and Hispanic women compared to white women (not shown).

Higher rates of domestic violence reports for black and Hispanic women in our sample than for white women are consistent with NCVS data, which show that a significantly higher percentage of black women (67%) than of white women (50%) report their victimization to the police.⁹ Hispanic women report their victimization to the police at significantly higher percentages than non-Hispanic women (65% vs. 52%).⁹ Using data from the NCVS, Bachman and Coker found that black women were more likely to report intimate-perpetrated violence as well as other types of violent crimes to police than white women, and black men who committed partner-perpetrated violence toward black women were more likely to be arrested for assault than were white men who victimized white women.¹⁵ Undoubtedly, a women's willingness to re-

Figure 5. Estimates of risk for and trends in police-reported domestic violence by unemployment rate and racial position among black, Hispanic, and white Rhode Island women ages 18–29 years, 1996–1998



NOTE: The unemployment rate is the percent of residents of a census block group ages ≥ 16 years who are in the labor force and unemployed.

Trend = beta coefficient for linear trend

CI = Confidence interval

port her victimization to the police may be influenced by the perception that the police will make an arrest. If white women who are victims of domestic violence do not see any deterrent value in calling the police, they will be undercounted in police incident reports. It is important to note that, unlike our study, the NCVS did not control for Census-based descriptors of neighborhoods that tap conditions of economic deprivation and privilege. A study by Smith, using observational data from the 1977 Police Services Study, found that when models predicting police arrest for interpersonal violence controlled for neighborhood poverty and other factors, race (black vs. white) was no longer significant in the analyses.³⁴

A second finding of this study is that the rate of police reports of domestic violence may be modified by concentrations of white residents in poor neighborhoods. In the poorest block groups, rates of police-reported domestic violence were higher for black and Hispanic women living in predominately white neigh-

borhoods than for white women in these neighborhoods. What might explain these differences? First, among the poorest block groups, if neighborhood social networks are largely organized along racial lines, then the public exposure that occurs with police intervention may discourage some women from calling the police. Thus within racial categories, women may be less likely to call the police if their neighbors are more similar in terms of race. Second, while we do not speculate that actual experiences of violence victimization differ markedly across racial composition of poor neighborhoods, we do hypothesize that differential modes of intervention may occur if these neighborhoods have higher concentrations of extended family members to provide protection from an abuser. This possibility may be particularly true for recent Hispanic, Afro-Caribbean, and African immigrants with large family networks in their neighborhoods.

A third finding is that the results of the linear regression analyses demonstrate the importance of strati-

Table 3. Estimates of relative risk and excess number of cases of police-reported domestic violence in relation to neighborhood measures of racial concentration for women living in poor areas, Rhode Island, 1996–1998

<i>Race of victim by concentration of white residents in census block group^a</i>	<i>Women in study sample living in poor areas^b</i> Number	<i>Black, Hispanic, and white women ages 18–62 living in poor areas in Rhode Island, 1990 (n = 39,427)^c</i> Number	<i>Average annual risk^d</i>	<i>Estimated RR^e (95% CI)</i>	<i>Estimate of excess number of cases per 100,000 women per unit change in socioeconomic gradient^f (95% CI)</i>
Black				2.76 (2.20, 3.46)	2,390 (1,855, 2,925)
<33% white	139	3,409	1,359		
33%–65.9% white	136	1,162	3,901		
66%–100% white	120	1,067	3,749		
Hispanic				2.94 (2.34, 3.68)	2,131 (1,684, 2,579)
<33% white	115	3,481	1,101		
33%–65.9% white	232	2,511	3,080		
66%–100% white	148	1,526	3,233		
White				1.60 (1.15, 2.23)	444 (133, 756)
<33% white	35	1,584	737		
33%–65.9% white	289	5,950	1,619		
66%–100% white	664	18,737	1,181		

^aRacial concentration is defined as the percent of non-Hispanic white residents in a census block group.

^bDefined as a block group in which $\geq 20\%$ of residents live in households with incomes below the federal poverty line.

^cSource of data: Reference 19.

^dMean number of cases per 100,000 women.

^eRisk in neighborhoods with at least 2/3 white residents relative to neighborhoods with fewer than 1/3 white residents.

^fBeta coefficient for linear trend.

RR = relative risk

CI = confidence interval

fying by race. The regression results for black women were significantly different from those for other women. For black women, living in block groups in which fewer than 10% of residents ages 25 and older were college educated contributed independently to risk of police-reported domestic violence, but neighborhood poverty and unemployment did not add to this excess. For Hispanic women, neighborhood-level relative poverty and education had significant effects on risk of police-reported domestic violence, while for white women, significant effects were found for relative poverty, unemployment, and education. Additionally, in the model for Hispanics, living in the most linguistically isolated block groups decreased risk. In light of these findings, replication of these analyses using data from the 2000 U.S. Census may be a fruitful area for future research.

Several limitations of this study warrant mention.

First, we may have overestimated the risk of police-reported domestic violence for Hispanic and black women and underestimated the risk for white women. In 1998, the last year data were collected for our study, people identified as non-Hispanic white made up 86.9% of the Rhode Island population, while 5.0% of the Rhode Island population was identified as black and 6.6% as Hispanic.³⁵ From 1990 to 1998, the number of Hispanic residents of Rhode Island increased by 41%, the number of black residents increased by 13%, and the number of white residents decreased by 5%.³⁵ If our denominators of cumulative incidence were adjusted for these population changes, the risk of police-reported domestic violence for racial minority women would be somewhat attenuated, particularly for comparisons of Hispanic women relative to white women. Unfortunately, intercensal estimates to adjust for changes in the Rhode Island population are

not available for block group measures of socioeconomic position. Although our data could not adjust for year-by-year changes in denominators, such changes would have to account for the full magnitude of the relative risk estimates across racial position.

Using 2000 statewide Census data,³⁶ we estimate that the average annual risk of police-reported domestic violence changed from 2.24% using 1990 denominators to 1.22% using year 2000 denominators for Hispanic women ages 18 years and older (not shown). For black women ages 18 years and older, the annual risk estimate was reduced from 2.87% using 1990 population data to 2.09% using 2000 Census data. For white women 18 years and older, 2000 estimates suggest a 0.82% average annual risk of police-reported domestic violence, compared with a 0.79% risk calculated using 1990 denominators. Conservatively, then, for the state overall, the relative risk of police-reported domestic violence across racial groups without consideration of social class or other indicators of neighborhood conditions becomes 1.48, compared with a relative risk with 1990 data of 2.73 for Hispanic women relative to white women. For black women, the estimate of risk compared to white women using 2000 Census data is 2.55, compared with a relative risk with 1990 data of 3.50 for black women relative to white women. Interpretation of a lower rate in police-reported domestic violence calculated using 2000 Census denominators is hampered by large increases in minority populations in the state and a lack of numerator data on police-reported violence within racial categories. We do not have Census data at the block group level or within categories of poverty or other indicators to estimate how this bias would affect our results. Assuming that these changes were proportional across socioeconomic indicators, the within-group race comparisons are most valid. At the same time, the between-group race comparisons overestimate differences in police-reported domestic violence within block groups with similar concentrations of poverty. Taking these overestimates into account, based on the most conservative denominators (i.e., using 2000 Census denominators with 1996–1998 cases), there remain crude overall excess risks of 48% for Hispanic women and 155% excess risk for black women relative to white women for police-reported domestic violence.

Second, some discrepancies may have occurred in the coding of race for women in the study sample. In their analyses of block group characteristics obtained from the 1990 U.S. Census, Kwok and Yankaskas found that the use of Census data to determine the racial characteristics of a census block group was more reliable for the majority white population than for the

black population.³⁷ The reliability of the racial classifications in the surveillance system is not known. Police may have inaccurately classified race on the DV/SA form, and this may have been differential across categories of neighborhood well-being. Residual confounding between race and economic deprivation in U.S. society should also be considered, since black residents of a wealthy block group, for example, are likely to be less wealthy than their white counterparts, while white residents of a poor block group are likely to be less impoverished than their black counterparts.^{25,26}

A third limitation of the study concerns the generalizability of the findings in relation to domestic violence risk. As discussed earlier, the Rhode Island surveillance system relies primarily on an incident-based police reporting form. Restraining order and emergency room data will be collected in the future, but this portion of the surveillance system is not yet operational and requires additional funding. It will probably always be difficult to estimate incidence and prevalence of domestic violence without periodic population-based surveys and statewide surveillance systems that collect data from multiple sources. In a previously published study, we compared domestic violence information from two data sources—the Rhode Island VAWPHS system and the Rhode Island Behavioral Risk Factor Surveillance System (BRFSS).²⁷ In that study, and in an extension of the analysis using 1998 and 1999 BRFSS data, we found that 3% of Hispanic women, 2% of black women, and 2% of white women reported recent physical abuse. No significant differences were found between female victims who called the police and those who did not contact the police by race, age, or household income. Although information on domestic violence from the Rhode Island surveillance system is not directly comparable to data from the BRFSS because surveillance system data pertain to one point in time while BRFSS information pertains to a 12-month period, findings from the BRFSS suggest that the Rhode Island police reporting surveillance system is fairly representative of victims disclosing domestic violence.

Findings from our study build on an important and growing body of research in which population-level and environmental data are collected to present a fuller picture of neighborhood-level factors that increase or decrease the risk of interpersonal violence toward women. The use of census block group socioeconomic measures, which are based on more economically homogeneous neighborhoods than are census tracts, is a strength of the current study. One caveat is that the study used data from a surveillance system funded by the Centers for Disease Control and Pre-

vention to identify geographic hot spots where domestic violence leading to police reports is most prevalent. The social stigma associated with these reports, which are not confidential documents and may be reported in the newspaper if an arrest results, may deter some women from calling the police. On the other hand, assuming the large differences across racial populations both within and across socioeconomic gradients are not fully explained by error, linking neighborhood concentrations of domestic violence to the surrounding socioeconomic milieu may assist anti-violence programs in identifying where resources are needed. Neighborhoods with low rates of police-reported domestic violence might be targeted with interventions that focus on law enforcement, while neighborhoods with high rates of police-reported domestic violence could be targeted with interventions to ensure access to legal and medical services.

In conclusion, our findings support the feasibility of linking population-based surveillance data with U.S. Census block group-level data to characterize neighborhood conditions associated with greater and lesser risk of police-reported domestic violence. Such linkage is useful for estimating incidence and prevalence of domestic violence and for designing population-level interventions. While our results suggest that neighborhood contextual descriptors are important indicators of women's safety that go beyond individual-level characteristics and are useful for identifying communities with different risks for domestic violence, it is evident in our data that individual racial position is strongly synergistic with these neighborhood socioeconomic indicators.

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