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The Relationship Between Multiple Forms of Discrimination, Neighborhood Characteristics, and Depression Among Illicit Drug Users in New York City

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Abstract

It is plausible that features of the social environment combined with experiences of discrimination may help further explain experiences of depression among illicit drug users. We examined the influence of census tract-level characteristics and multiple forms of individual-level discrimination on lifetime depression among illicit drug users in New York City enrolled in the “Social Ties Associated With Risk of Transition” study. Population average models accounted for clustering of individuals within census tracts. Discrimination based on prior incarceration explained Hispanic/White differences in depression and was independently associated with depression after accounting for neighborhood characteristics. Neighborhood poverty was only marginally related to lifetime depression. These data provide evidence supporting the influence of discrimination on depression among drug users. Research is needed to confirm these findings and highlight specific mechanisms through which discrimination and neighborhood socioeconomic status may operate to influence mental health.

Keywords

discrimination; neighborhood characteristics; depressive symptoms; illicit drug users

The lifetime prevalence of depression in the U.S. population was approximately 15.7% in 2006 (Centers for Disease Control and Prevention, 2009) and the rate of depression among

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illicit drug users is twice that of non-illicit drug users (Substance Abuse and Mental Health Services Administration, 2009). The comorbidity of depression and substance use has been well documented and has important implications for drug use and other high-risk behavior outcomes (Huang et al., 2006; Kessler et al., 2003). Specifically, depressed substance users have an increased likelihood of substance use and drug use relapse compared with non-depressed substance users (Brown et al., 1998; Meyer, Schwartz, & Frost, 2008; Tate, Brown, Unrod, & Ramo, 2004). In addition, the co-occurrence of mental and substance use disorders may lead to the initiation or the exacerbation of high-risk drug use behaviors such as syringe sharing, sex while using drugs, and other unsafe sex practices (Salomon et al., 2009). The mechanisms underlying the comorbidity have not been fully elucidated, but explanations related to genetic, neurobiological factors and self-medication have been argued (Davis, Uezato, Newell, & Frazier, 2008; Leeies, Pagura, Sareen, & Bolton, 2010). However, these factors alone do not explain the magnitude of the comorbidity observed (Volkow, 2004). It is conceivable that factors related to social stressors, namely discrimination, and the social environment may be important in explaining the high prevalence of mental and substance use disorders.

Due to the growing body of evidence supporting the impact of racial discrimination on mental health outcomes (Bhui et al., 2005; Finch, Kolody, & Vega, 2000; Kessler, 1997; Williams, Neighbors, & Jackson, 2003) and more recently, risk behaviors (Chae et al., 2008; Guthrie, Young, Williams, Boyd, & Kintner, 2002), investigating the role of various forms of discrimination on depression within the context of substance use is a natural next step. Discrimination refers to a system of differential treatment and opportunities that can act on multiple levels to unfairly disadvantage groups of people because they hold certain characteristics (e.g., race, sex, religion, drug use, prior incarceration) that are negatively construed (Jary & Jary, 1995; Jones, 2000, 2003). Most studies on discrimination and mental health have focused on discrimination based on race/ethnicity (e.g., African American, Latinos, and Asians) and have been conducted in predominantly non-drug using populations (Pascoe & Smart Richman, 2009; Stuber, Meyer, & Link, 2008; Williams et al., 2003). Findings from these studies suggest that various forms of interpersonal discrimination influence depression, which may in turn influence health behaviors (e.g., sexual and drug use practices and drug treatment enrollment; Ahmed, Mohammed, & Williams, 2007; Williams et al., 2003).

The impact of discrimination on other marginalized and stigmatized groups such as substance users is beginning to receive closer attention. Although investigations of discrimination and its relation to mental health among drug users is sparse, there is evidence of an independent association between racially and non-racially based discrimination and higher prevalence of depression and lower mental health scores among substance users (Ahern, Stuber, & Galea, 2007; Stuber et al., 2008). Because drug use is criminalized, substance users are stigmatized for a variety of reasons, which may result in discrimination based on race, prior incarceration, drug use, and poverty (Blendon & Young, 1998; Kadushin, Reber, Saxe, & Livert, 1998). Studies have also demonstrated a link between experiencing different forms of discrimination and poor mental health (Stuber et al., 2008). It is possible that experiencing multiple forms of discrimination or unfair treatment due to identification with highly stigmatized groups may exacerbate the likelihood of poor mental

health. For example, Meyer and colleagues (2008) found that being members of two highly stigmatized populations (i.e., had a lesbian, gay, or bisexual sexual orientation and belonged to racial/ethnic minority group) was associated with higher levels of stress compared with being a member of only one stigmatized population. However, few studies have examined the independent or joint effect of experiencing multiple forms of discrimination among drug users and elevated risk of depression.

It is possible that discrimination may manifest differently within different types of social environments. For example, neighborhood characteristics have been shown to be independently associated with levels of depression (Beard et al., 2009; Cutrona, Wallace, & Wesner, 2006; Galea et al., 2007) and reports of racial discrimination (Dailey, Kasl, Holford, Lewis, & Jones, 2010). However, the relationship between neighborhood characteristics and depression in the presence of various forms of discrimination has not been examined to our knowledge. Neighborhood characteristics influence critical neighborhood resources (e.g., employment opportunities), and the lack of resources can add additional strife or relief to a stressful experience of discrimination (Cutrona et al., 2006). Moreover, specific features of the neighborhood environment may shape the perception of stress in one's environment. For example, Schulz and colleagues (2008) found that neighborhood racial/ethnic composition (e.g., percentage of African American) and residential stability were associated with perceived social stress which included neighborhood characteristics such as gang activity, drug dealing, gun shooting, prostitution, loitering and theft, vandalism or arson. In another study, Stuber, Galea, Ahern, Blaney, and Fuller (2003) found racial and nonracial discrimination and racial/ethnic composition were important for mental health. While Black persons living in neighborhoods with highly concentrated Black populations were less likely to report poor mental health, Latinos living in neighborhoods with highly concentrated Latino populations were more likely to report poor mental health (Stuber et al., 2003). This body of literature provides evidence of a race-related neighborhood effect (i.e., social cohesion) that may buffer or intensify stress levels and potentially subsequent depressive symptoms. However, Stuber and colleagues (2003) did not examine neighborhood poverty which may have underestimated the effect of neighborhood context and its relation with mental health (Beard et al., 2009; Galea et al., 2007) in non-drug using populations in the United States.

It is highly plausible that the independent and joint effects of various forms of discrimination and neighborhood characteristics profoundly affect illicit drug users. For drug users who reside in neighborhoods with higher levels of poverty, the result of discrimination due to drug use or incarceration may be even more daunting as fewer neighborhood resources (e.g., jobs and financial, health, and social support services) are available to counteract the negative influences of discrimination, thereby increasing the likelihood of depression. In an effort to build on the current body of literature focused on the social context of depression, this manuscript examines the relation between multiple forms of discrimination and depression while taking salient neighborhood characteristics into account among illicit drug users in New York City (NYC). We hypothesize that (a) drug users who experience multiple forms of discrimination will be significantly more likely to have experienced depression, and (b) neighborhood characteristics will be independently

associated with depression after accounting for sociodemographic characteristics and reports of discrimination.

Method

Study Overview

This study utilized baseline data from illicit drug users enrolled in the Social Ties Associated With Risk of Transition (START) study. START is an 18-month cohort study conducted between July 2006 and June 2009 in NYC among 652 recently initiated injection drug users (IDUs) and heavy non-injection drug users (NIDUs). Detailed methods have been described elsewhere (Rudolph et al., 2011). In brief, eligibility included individuals aged 18 to 40, current injection drug use of heroin, crack, or cocaine for 4 years or less or current non-injection drug use of heroin, crack, or cocaine for 1 year or more. For this analysis, participant recruitment location was mapped and combined with 2000 census level data at the tract level to ascertain important features of the social environment in each recruitment tract. The institutional review boards of Columbia University and The New York Academy of Medicine approved this study.

Recruitment

IDUs and NIDUs were recruited simultaneously using two recruitment strategies: (a) targeted street outreach (TSO) and (b) respondent-driven sampling (RDS). TSO, which has been described in detail previously, was completed in 32 ethnographically mapped high-drug activity neighborhoods in NYC using a varied time approach where different neighborhoods were visited at different times and days to obtain a more representative sample of each area (Ompad et al., 2008). RDS was also conducted and has been described elsewhere in detail (Rudolph et al., 2011). In brief, RDS is an incentivized chain-referral recruitment strategy in which seed (initial) participants recruit their drug using peers into the study (Broadhead, Heckathorn, Grund, Stern, & Anthony, 1995).

Data Collection

Eligible and consenting IDUs and NIDUs completed face-to-face interviewer-administered paper surveys conducted in either Spanish or English. To increase interviewer-participant rapport and trust and decrease social desirability bias, many of the interviewers were from the communities within which recruitment was conducted. In addition, several interviewers had former drug use histories (Ford & Airhihenbuwa, 2010). This study also included 6-month, 12-month, and 18-month follow-up interviewer-administered survey instruments among the NIDUs. Only baseline (conducted among NIDUs) and cross-sectional (conducted among IDUs) data that obtained information on demographics, drug use practices, and depression and discrimination experiences were used for this analysis.

Individual-Level Measures

The outcome, lifetime depression, was ascertained using four questions from the Composite International Diagnostic Interview (CIDI; World Health Organization, 2004). To be categorized with lifetime depression, participants had to respond in the affirmative to the following questions: “In your lifetime, have you ever had a period of at least 2 weeks when

nearly every day you felt sad, depressed, or empty most of the time” and “Have you ever had a period of at least 2 weeks when you lost interest in most things or got no pleasure from things which would usually have made you happy?” In addition, participants had to respond in the affirmative to at least one of the following questions: “Has there ever been a period when you thought about committing suicide?” or “Did you ever try to end your own life (whether or not you had thought about it ahead)?”

The primary independent variable of interest, lifetime discrimination, was measured using one question modified from previous discrimination studies (Krieger, 1990; Krieger & Sidney, 1996) for examination among drug using populations (Young, Stuber, Ahern, & Galea, 2005). This question asked, “In your lifetime, have you ever been discriminated against, prevented from doing something, or been hassled or made to feel inferior because of any of the following?” Available response categories included: “age,” “race,” “sex (gender),” “sexual orientation,” “poverty,” “drug use,” “having been in jail or prison,” “religion,” “mental illness,” “physical illness,” “other,” and “I have never been discriminated against.” This analysis focused on the three most common forms of discrimination reported: having ever or never experienced discrimination due to race, drug use, and prior incarceration. Racial and drug use discrimination were dichotomized as yes/no. Incarceration discrimination was categorized as not incarcerated, incarcerated but no discrimination due to incarceration, and incarcerated with discrimination due to incarceration.

Racial/ethnic group was included as a covariate in the analysis. Participants self-identified as Hispanic or Latino, Black, White, Asian or Pacific Islander, Native American, Eskimo, or Aleutian, Black and Hispanic, Mixed, and Other. For this analysis, racial/ethnic groups (hereafter described as race) were categorized as Hispanic, non-Hispanic Black, and all Other racial/ethnic groups (hereafter referred to as Whites). Whites ($n = 64$) were combined with Asians/Pacific Islanders ($n = 2$), Native Americans/Eskimos/Aleutians ($n = 1$), Mixed ($n = 18$), and Other ($n = 7$), due to their small sample sizes. All participants who identified Black as their race/ethnicity were asked whether they considered themselves African American ($n = 292$), West Indian/Caribbean ($n = 12$), Caribbean/French speaking ($n = 3$), African ($n = 2$), Mixed ($n = 7$), or Other ($n = 1$). While all individuals who identified as Black for their racial/ethnic background were aggregated to the Black group, we also performed this analysis including only Blacks who identified as African American, given their sociohistorical experience of race in the United States, and the results did not change. Finally, Hispanics who identified as Black ($n = 5$) were combined with Hispanics rather than non-Hispanic Blacks because (a) Hispanics who identified as black were similar to Hispanics with respect to reports of discrimination due to drug use (data not shown) and (b) being of Hispanic ethnicity may confer different interpretations, meanings, and experiences of discrimination (Smedley & Smedley, 2005).

Other covariates identified in the literature as potentially important in the relationship between discrimination, neighborhood, and depression (Young et al., 2005) included age (continuous), sex (female, male), education level (<high school, high school degree or general equivalency diploma (GED), and college or more), total legal income (none, <US \$5,000, US\$5,000), marital status (married, unmarried), and ever homeless (yes, no). In

addition, drug use behavior questions, specifically primary drug used (powder cocaine, crack, heroin, and poly drug use which includes all drug types) and injection status (noninjector, injector) were also considered. Finally, recruitment strategy (RDS, TSO) was included to account for potential differences by sampling strategy.

Neighborhood-Level Measures

START baseline data indicating the neighborhood the participant was recruited from was mapped to the corresponding census tract and neighborhood attributes of these tracts were taken from the 2000 U.S. census for this analysis. Participants most often described the neighborhood they were recruited in as the location where they hung out, purchased drugs, and spent most of their time. It is important to note that previous research examining street recruitment and neighborhood residence found that the majority of illicit drug users in urban settings (85%) lived in the neighborhoods within which they were recruited (Fuller et al., 2005). Study participants with missing census tract ($n = 16$) were excluded from this analysis yielding 636 observations. Neighborhood characteristics selected for analysis were derived from the literature and included minority composition (percentage of Black, percentage of Latino, and percentage of foreign-born), percentage in poverty, and percentage of unemployed (Cutrona et al., 2006). These variables were analyzed as continuous variables modeled as the likelihood of having lifetime depression for every 10% increase in the neighborhood characteristic.

Statistical Analysis

Descriptive statistics of the sample were calculated. Given the high prevalence of depression in the sample, prevalence ratios (PRs; Greenland, 1987), rather than odd ratios which estimate rare outcomes, were calculated using log-binomial regression with robust standard errors (SAS Institute, 2008; Zou, 2004). Variables significantly associated ($p < .05$) with depression in the unadjusted models were included in the adjusted models. To address the issue of sparse data cells in the models assessing neighborhood characteristics, a Poisson distribution was specified in the log-binomial model. To understand the association between different types of discrimination independently and jointly with neighborhood characteristics on lifetime depression, the following models were fit: (a) PR accounting for important sociodemographic characteristics (crude PR) adjusted for racial discrimination, (b) crude PR adjusted for discrimination due to incarceration, (c) crude PR adjusted for discrimination due to drug use, (d) crude PR adjusted for all three forms of discrimination, (e) crude PR adjusted for neighborhood characteristics, and (f) crude PR adjusted for all three forms of discrimination and neighborhood characteristics. To understand the impact of experiencing multiple types of discrimination, two-way interaction terms between each form of discrimination were assessed independently. Results of significant interactions ($p < .05$) are presented by calculating the postinteraction estimates. The entire analytic sample was included in all of the models ($n = 636$), except those including discrimination due to incarceration ($n = 468$).

Results

Selected characteristics of the study sample are presented in Table 1. About 26% of all participants experienced discrimination based on race and 32.8% experienced discrimination based on drug use. Experiences of discrimination due to incarceration were reported by 27.4% of study participants who spent time in jail or prison. Recruitment neighborhoods had high proportions of Black residents (51.6%), low proportions of foreign-born persons (19.2%), and high proportions of residents living at the poverty level (40.1%). The average NYC neighborhood between 2000 and 2010 was 25.5% Black, 28.6% Latino, 35.9% foreign-born, and 18.6% of residents at the poverty level (State and County QuickFacts, 2011).

The overall lifetime prevalence of depression in this study sample was 50.0%. Hispanics were significantly more likely than Whites to have experienced lifetime depression (Table 2). No Black–White differences in depression were noted. Those who were discriminated against because of race: PR: 1.38; 95% confidence interval (CI) = [1.18, 1.61]; prior incarceration, PR: 1.74; 95% CI = [1.49, 2.03]; or drug use, PR: 1.53; 95% CI = [1.32, 1.78] had a significantly higher prevalence of lifetime depression. Neighborhoods characterized by a higher percentage of persons living in poverty and unemployment also had higher reports of lifetime depression. As neighborhood poverty and unemployment were highly correlated (Pearson's $r = 78\%$), we only included neighborhood poverty in the final models to avoid overadjustment.

Table 3 presents results from the adjusted models examining discrimination and neighborhood context independently and jointly. After adjusting for race, racial discrimination, drug use discrimination, and neighborhood poverty, individuals who experienced discrimination due to incarceration (adjusted PR [APR]: 1.46; 95% CI = [1.21, 1.77]) had a robustly increased prevalence of lifetime depression (Model 6). Racial discrimination (APR: 1.19; 95% CI = [1.00, 1.40]) and drug use discrimination (APR: 1.21; 95% CI = [1.01, 1.45]) were only marginally related to lifetime depression. Racial differences in lifetime depression were marginally related after accounting for experiences of discrimination and neighborhood poverty, where Hispanics had an increased likelihood of lifetime depression compared with Whites. Neighborhood-level percentage in poverty was also marginally related, but this relationship reached significance in the fully adjusted model ($p = .05$; Model 6). Interaction terms between racial discrimination and incarceration discrimination were significant ($p = .0023$). Interestingly, when stratifying by racial discrimination, those who experienced discrimination based on race and incarceration were not more likely to experience depression. However, those who experienced discrimination due to incarceration alone (APR: 1.93; 95% CI = [1.59, 2.34]) were significantly more likely to have experienced lifetime depression (Table 4). We also explored various interactions by race (e.g., racial discrimination, incarceration discrimination, percentage in poverty, percentage of Black, and percentage of Latino) and found no statistically significant differences.

Discussion

This study found that drug users who ever experienced discrimination due to incarceration had higher reports of depression in their lifetime. We observed that this relationship was stronger among those who did not experience racial discrimination. Consistent with prior research, no Black/White racial differences in lifetime depression were present and those between Hispanics and Whites were only marginal after adjusting for incarceration discrimination. Findings from studies among non-drug users are also consistent with those from this study; discrimination is associated with lifetime depression and although marginally related in this study, neighborhood poverty may also be an important contextual factor related to depression (Ahmed et al., 2007; Galea et al., 2007; Noh, Beiser, Kaspar, Hou, & Rummens, 1999; Stuber et al., 2003; Stuber et al., 2008; Williams et al., 2003). While more research is needed to better understand the role of various forms of discrimination on depression among illicit drug users, there are several potential explanations for these findings.

One explanation could be that a discriminatory experience related to prior incarceration could spiral into a host of unintended social and health consequences especially throughout the life course in the form of chronic stress, lack of job opportunities, and low economic and educational attainment (Galea & Vlahov, 2002). This may be particularly detrimental for drug users, who are already highly criminalized and stigmatized by the general population and experience severe social and economic disadvantage (Blendon & Young, 1998). There is a paucity of research on the influence of discrimination due to nonracial attributes (i.e., incarceration) on health, but it is possible that when discrimination due to incarceration acts independently of racial discrimination, its effects are more devastating because of the resulting measurable injustices (i.e., increased sentencing, poorer living conditions in and out of the prison system, inability to secure employment; Friedman, Cooper, & Osborne, 2009). While racial discrimination has the potential to influence injustice, the pathway through which it affects health may be different from that resulting from other forms of discrimination. Future studies on discrimination should explicate the pathway that each specific form of discrimination could impact health as they may have different implications for the magnitude of impact.

A second explanation could be that minorities who are more accustomed and adept to coping with experiences of racial discrimination because of the history of racism in America, process discrimination differently than groups that do not report or perceive racial discrimination. Brondolo, Brady Ver Halen, Pencille, Beatty, and Contrada (2009) describe this as a “well-developed racial identity” among Blacks that allows them to accept and adapt to environments of discrimination by depersonalizing negative treatment due to race (Brondolo, Brady Ver Halen, Pencille, Beatty, & Contrada, 2009). Perception of discrimination due to other stigmatizing characteristics (e.g., drug use, former incarceration) may be more mentally burdening as Blacks and other minority groups have not been socialized to cope with nonracial discriminatory experiences over the life course. Likewise, non-Black groups who do not have the same historical perspective may not have developed the same coping responses or ethnic identity that allow them to depersonalize discriminatory experiences and therefore, when they experience discrimination, its effects are more

detrimental (Brondolo et al., 2009). Thus, future studies assessing discrimination should take into account that the pathway between discrimination and health may vary by the type of discrimination experienced, as well as by the sociohistorical context in which discrimination is experienced.

While our findings suggest that neighborhood-level poverty may be associated with depression, the most notable results of this report are that incarceration discrimination was highly associated with lifetime depression even after accounting for contextual neighborhood characteristics and incarceration discrimination explained racial differences in depression among Hispanics and Whites. Given that this is the first report, to our knowledge, to investigate the relationship between different forms of discrimination, neighborhood-level characteristics and lifetime depression among drug users, future studies should continue to investigate the specific influence of neighborhood poverty on depression. Moreover, studies should examine the temporal relationship between discrimination, neighborhood context, and depression.

Several biases may impact the validity of the findings presented in this report. For example, self-report bias may have resulted in an under- or overestimation of discrimination. Biases related to the measurement of the dependent and independent variables may also influence the results of this study. For example, self-reported lifetime depression may have been over- or underestimated because of the broad, non-clinical measures used to assess depression. While these measures have been validated and are commonly used (Andrews & Peters, 1998), they have not been validated in a drug using population and may be insufficient in capturing experiences of depression across the lifetime.

Due to the cross-sectional nature of the data, we are unable to establish temporality or “direction” of causality. However, to increase the strength in the results of this study, we assessed the relationship between discrimination, current neighborhood, and past-year depression and the results were similar (data not shown). Nevertheless, future studies should attempt to assess the temporal relationship between discrimination, neighborhood context and depression. Associated with the issue of temporality is the use of lifetime discrimination and depression measures along with current neighborhood characteristics. As people may have relocated in their lifetime, their current neighborhood characteristics may not accurately reflect the neighborhood structure at the time when the participants’ depression or experience of discrimination actually occurred. Moreover, lifetime discrimination or depression may account for one or many episodes of discrimination or depression, which may or may not be associated with the characterization of the participants’ current neighborhood. There is some evidence showing that drug users who move from deprived neighborhoods relocate to similarly deprived neighborhoods (Genberg et al., 2011), therefore, the neighborhood environment that lifetime discrimination and depression events were experienced in are likely similar which would minimize the bias present in our study. Nevertheless, this argument underscores the importance of using life-course methods to understand directionality between neighborhood residence, episodes of homelessness, and experiences of discrimination and depression. Given that census data used in this study was collected from 1990 to 2000, the neighborhood characteristics may not accurately reflect the neighborhood factors that were important for these study participants at the time when they

were interviewed (2006-2009). While it is possible that the conditions of the neighborhoods have changed over one's lifetime, previous research has indicated that potential bias related to changes in neighborhood socioeconomic status (SES) predictors including employment over a 10-year period is minimal (Geronimus & Bound, 1998). However, future studies should better assess the timing of depression with residence in the neighborhood to ensure that the period of neighborhood-level exposure is consistent with future mental health decline.

Finally, self-selection bias may have also affected the total sample we were able to obtain through TSO and RDS methods, which may limit external generalizability by only including drug users who are most visible and most comfortable self-selecting into research studies. While TSO and RDS are the most commonly used methods for recruiting illicit drug using populations who lack a known sampling frame from which to draw a random sample from, these findings still may not be generalizable to high income drug users and drug users outside of NYC neighborhoods. Neighborhoods are complex, multidimensional structures that are constantly fluctuating and the context of the neighborhood characteristics examined in this paper may be different in smaller cities, more rural U.S. areas, and areas outside of the United States. Thus, these findings most likely reflect the relationship between discrimination, neighborhoods, and depression among poor, urban substance users.

Provided that these findings are replicated in studies with more robust designs that better approximate a causal relationship, a host of interventions can be targeted toward drug users to temper the comorbidity of depression and illicit drug use. For example, scale-up and integration of mental health services in venues where illicit drug users can be reached such as drug treatment programs, AIDS service organizations, homeless shelters, and jail and prison facilities could assess the potentially negative effects of various discrimination experiences and provide counseling to buffer negative effects. Reduction of comorbid depression and illicit drug use may have subsequent benefits on reducing drug use and drug treatment outcomes. Therefore, the public health importance and potential impact of assessing and addressing social factors that influence this comorbidity are far reaching.

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Biography

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Crystal M. Fuller, PhD, has a PhD in Epidemiology from Johns Hopkins University, Bloomberg School of Public Health, has served as faculty in the Department of Epidemiology, Mailman School of Public Health at Columbia University for 13 years, and is currently an Associate Professor. Dr. Fuller has led several federal and private-funded research studies leading to a publication record of over 65 peer-reviewed manuscripts and 3 book chapters. Dr. Fuller's research portfolio includes extensive experience in the design, conduct, and analysis of community-based HIV and drug abuse studies, particularly structural and multilevel intervention studies focused on racial disparities in HIV/AIDS and related social and medical consequences.

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Table 1START Sample Characteristics, 2006-2009 (*n* = 636).

Sociodemographic	Distribution of characteristics	
	Median	IQR
Age group	33	28-37
	<i>n</i>	%
Race/ethnicity		
Hispanic/Latino	231	36.32
Black	314	49.37
White/Other	91	14.31
Male	446	70.13
Education		
<High school	316	49.76
High school/GED	225	35.43
Some college or more	94	14.80
Legal income		
None	134	22.26
US\$1-US\$4,999	364	60.47
>US\$5,000	104	17.28
Unmarried	537	84.97
Ever homeless	564	88.68
Targeted street outreach	219	34.43
Lifetime depression	318	50.00
Drug use characteristics		
Primary drug used		
Powder cocaine	61	10.20
Crack cocaine	311	52.01
Heroin	161	26.92
Poly drug use	65	10.87
Injector	137	21.64
Discrimination		
Incarceration		
Not incarcerated	112	19.65
Incarcerated, no incarceration discrimination	302	52.98
Incarcerated, incarceration discrimination	156	27.37
Race	162	74.08
Drug use	205	32.80
Neighborhood characteristics ^a	Median (IQR)	
% Black	51.58 (25.52-75.78)	
% Latino	29.45 (13.68-49.77)	
% Foreign-born	19.23 (14.51-27.64)	

Sociodemographic	Distribution of characteristics	
	Median	IQR
Age group	33	28-37
	<i>n</i>	%
% Poverty	40.06 (29.39-49.12)	
% Unemployed	19.27 (14.12-20.34)	

Note. START = social ties associated with risk of transition; IQR = interquartile range; GED = general equivalency diploma.

^a Census tracts = 143.

Table 2

Unadjusted Prevalence Ratios (95% CI) of Lifetime Depression by Selected Sociodemographic, Drug Use, Discrimination, and Neighborhood Characteristics, 2006-2009 ($n = 636$).

<u>Unadjusted lifetime depression</u>	
	PR (95% CI)^a
Sociodemographic	
Age	1.00 [0.99, 1.01]
Race/ethnicity	
Hispanic/Latino	1.37 [1.06, 1.78]
Black	1.06 [0.81, 1.39]
White/Other	Reference
Female	1.11 [0.94, 1.30]
Education	
<High school	Reference
High school degree/GED	0.89 [0.74, 1.06]
Some college or more	1.00 [0.80, 1.25]
Legal Income	
None	Reference
US\$1-US\$4,999	0.98 [0.81, 1.16]
\$5,000	0.94 [0.73, 1.20]
Unmarried	0.96 [0.75, 1.19]
Ever homeless	1.22 [0.92, 1.63]
Targeted street outreach	0.89 [0.76, 1.04]
Drug use characteristics	
Primary drug used	
Powder cocaine	Reference
Crack cocaine	0.95 [0.80, 1.13]
Heroin	1.09 [0.92, 1.30]
Poly drug use	0.77 [0.56, 1.05]
Injector	0.99 [0.82, 1.19]
Discrimination	
Race	1.38 [1.18, 1.61]
Incarceration	1.75 [1.48, 2.07]
Not incarcerated	1.17 [0.93, 1.46]
Incarcerated, no incarceration discrimination	Reference
Incarcerated, incarceration discrimination	1.74 [1.49, 2.03]
Drug use	1.53 [1.32, 1.78]
Neighborhood characteristics ^b	
% Black	0.99 [0.96, 1.02]
% Latino	1.03 [0.99, 1.06]
% Foreign-born	0.98 (0.94, 1.02]

<u>Unadjusted lifetime depression</u>	
	PR (95% CI)^a
% Poverty	1.05 [1.00, 1.11]
% Unemployed	1.07 [1.00, 1.15]

Note. CI = confidence interval; PR = prevalence ratio; GED = general equivalency diploma.

^a Unadjusted models for each characteristic and lifetime depression were performed using log-binomial regression to estimate the prevalence ratio and 95% CI for individual measures. Sandwich error estimators specified to obtain conservative standard errors.

^b Clustering of individuals within neighborhoods were accounted for. Prevalence ratio interpreted as the prevalence of depression associated with every 10% increase in the specified neighborhood characteristic.

Table 3

Adjusted Prevalence Ratios (95% CI) of the Relationship Between Lifetime Depression, Discrimination, and Neighborhood Characteristics, 2006-2009 ($n = 636$).

Sociodemographic	Adjusted lifetime clinical depressive symptom					
	PR (95% CI) ^a					
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Race						
Hispanic/Latino	1.35 [1.06, 1.73]	1.32 [1.03, 1.68]	1.31 [1.02, 1.69]	1.27 [1.00, 1.62]	1.32 [1.02, 1.72]	1.31 [1.02, 1.68]
Black	1.04 [0.81, 1.34]	1.10 [0.86, 1.42]	1.12 [0.87, 1.44]	1.10 [0.87, 1.40]	1.04 [0.79, 1.35]	1.09 [0.84, 1.40]
White/Other	Reference	Reference	Reference	Reference	Reference	Reference
Discrimination						
Race	1.39 [1.20, 1.62]			1.05 [0.89, 1.24]		1.19 [1.00, 1.40]
Incarceration						
Not incarcerated		1.18 [0.94, 1.49]		1.19 [0.95, 1.49]		1.20 [0.95, 1.50]
Incarcerated, no incarceration discrimination		Reference		Reference		Reference
Incarcerated, incarceration discrimination		1.69 [1.44, 1.97]		1.47 [1.22, 1.77]		1.46 [1.21, 1.77]
Drug use			1.49 [1.28, 1.73]	1.22 [1.02, 1.46]		1.21 [1.01, 1.45]
Neighborhood characteristics ^b						
% Poverty					1.04 [0.99, 1.09]	1.05 [1.00, 1.10]

Note. CI = confidence interval; PR = prevalence ratio.

^aPopulation average log-binomial models to estimate the prevalence ratio and 95% CI between lifetime clinical depressive symptom and each characteristic. Sandwich error estimators specified to obtain conservative standard errors.

^bClustering of individuals within neighborhoods were accounted for. Prevalence ratio interpreted as the prevalence of depression associated with every 10% increase in the specified neighborhood characteristic.

Table 4

Adjusted Prevalence Ratios (95% CI) of Lifetime Depression Stratified by Experiences of Racial Discrimination Accounting for Sociodemographic Characteristics, 2006-2009 ($n = 636$).

	Racial discrimination^{a,b}	
	Yes	No
Incarceration discrimination		
Not incarcerated	0.91 [0.58, 1.40]	1.31 [1.01, 1.71]
Incarcerated, no incarceration discrimination	1.00	1.00
Incarcerated, incarceration discrimination	1.13 [0.88, 1.45]	1.93 [1.59, 2.34]

Note. CI = confidence interval.

^aLog-binomial regression performed to estimate the prevalence ratio and 95% CI between lifetime depression and discrimination due to incarceration and drug use stratified by racial discrimination and adjusting for education and race.

^bAdjusted for race/ethnicity.