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## Neighborhood-level LGBT hate crimes and current illicit drug use among sexual minority youth

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### Abstract

**Objective**—To investigate whether past-30 day illicit drug use among sexual minority youth was more common in neighborhoods with a greater prevalence of hate crimes targeting lesbian, gay, bisexual, and transgender (LGBT, or sexual minority) individuals.

**Methods**—We used a population-based survey of public school youth in Boston, Massachusetts, consisting of 1292 9th–12th grade students from the 2008 Boston Youth Survey Geospatial Dataset (sexual minority  $n = 108$ ). Data on LGBT hate crimes involving assaults or assaults and battery between 2005 and 2008 were obtained from the Boston Police Department and linked to youths' residential address. Youth reported past-30 day use of marijuana and other illicit drugs. Wilcoxon–Mann–Whitney tests and corresponding  $p$ -values were computed to assess differences in substance use by neighborhood-level LGBT assault hate crime rate among sexual minority youth ( $n = 103$ ).

**Results**—The LGBT assault hate crime rate in the neighborhoods of sexual minority youth who reported current marijuana use was 23.7 per 100,000, compared to 12.9 per 100,000 for sexual minority youth who reported no marijuana use ( $p = 0.04$ ). No associations between LGBT assault hate crimes and marijuana use among heterosexual youth ( $p > 0.05$ ) or between sexual minority marijuana use and overall neighborhood-level violent and property crimes ( $p > 0.05$ ) were detected, providing evidence for result specificity.

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### Contributors

Dustin T. Duncan – had full access to all of the data in the study and takes responsibility for the integrity of the data and the accuracy of the data analysis; study concept and design; geocoded and created the GIS measures of LGBT hate crimes; analysis and interpretation of data; drafting of the manuscript; statistical analysis.

Mark L. Hatzenbuehler – study concept and design; analysis and interpretation of data; critical revision of the manuscript for important intellectual content; study supervision.

Renee M. Johnson – critical revision of the manuscript for important intellectual content.

All authors contributed to and approved the final manuscript.

### Conflict of interest

The authors have no conflicts of interest to report.

**Conclusions**—We found a significantly greater prevalence of marijuana use among sexual minority youth in neighborhoods with a higher prevalence of LGBT assault hate crimes. These results suggest that neighborhood context (i.e., LGBT hate crimes) may contribute to sexual orientation disparities in marijuana use.

## Keywords

Illicit drug use; Marijuana use; Sexual orientation; LGBT assault hate crimes; Social determinants

## 1. Introduction

Adolescence is an important developmental period for the initiation of illicit drugs (Gruber and Pope, 2002; Latimer and Zur, 2010; CDC, 2012). National estimates report that 24.4% of 13–18 year olds report lifetime prevalence of illicit drugs (Swendsen et al., 2012). Marijuana is the most commonly used illicit drug among youth, by far (Johnston et al., 2003; Latimer and Zur, 2010). The 2011 High School Youth Risk Behavior Survey found that 39.9% of youth in the U.S. used marijuana in their lifetime and 23.1% of youth in the U.S. used marijuana in the last 30 days (CDC, 2012). Substance use in adolescence is associated with increased risk for substance use disorders, school failure, sexually transmitted infections, and other psychosocial and health problems (Behrendt et al., 2009; Chen et al., 2005; Gruber and Pope, 2002).

Both cross-sectional and longitudinal studies have shown that sexual minority youth (e.g., those who identify as lesbian, gay or bisexual or experience same-sex attractions and/or relationships) are more likely to use drugs than heterosexual youth (Corliss et al., 2010; Garofalo et al., 1998; Marshal et al., 2008; Russell et al., 2002). A meta-analysis found that the odds of substance use among sexual minority youth are nearly twice that of heterosexual youth (Marshal et al., 2008). Furthermore, sexual minority youth were 1.56 times more likely to report past 30-day marijuana use, and were 2.58 times more likely to report lifetime marijuana use, compared to their heterosexual peers (Marshal et al., 2008).

An Institute of Medicine (2011) report on sexual minority health disparities noted that the reasons for higher levels of substance use, including marijuana use, among sexual minority youth are largely unknown. However, the stigma related to sexual orientation is frequently cited as a risk factor for health disparities between sexual minority and heterosexual populations. Several studies have documented associations between various stigma-related stressors and substance use among sexual minority youth (Coker et al., 2010), including gay-related stressful life events (e.g., identity disclosure; Rosario et al., 1996), victimization at school (Bontempo and D'Augelli, 2002), and verbal/physical abuse (Savin-Williams, 1994). This research has provided important information on risk factors for substance use, including marijuana use, but has tended to focus on individual and interpersonal forms of stigma. Neighborhood environments play a significant role in shaping patterns of population health and health disparities (Berkman and Kawachi, 2000; Kawachi and Berkman, 2003; Link and Phelan, 1995; Marmot and Wilkinson, 2006). Although *Healthy People 2020* suggested that neighborhood factors may influence sexual minority health, very limited research has examined whether neighborhood factors contribute to substance use among gay men (Buttram and Kurtz, 2013; Carpiano et al., 2011) and sexual minority adolescents (Hatzenbuehler et al., 2011).

We sought to address this gap in the literature by examining one neighborhood factor that is likely salient to the health of sexual minority youth—that of neighborhood-level hate crimes. Hate crimes are defined as “unlawful, violent, destructive or threatening conduct in which the perpetrator is motivated by prejudice toward the victim’s putative social group” (Green

et al., 2001). Sexual minorities are frequent targets of hate crimes (Herek, 2009); in fact, 17% of the 88,463 hate crimes in the U.S. from 1995 to 2008 were directed toward sexual minorities (FBI, 2012).

Previous empirical research with general (i.e., non-sexual minority) samples suggests that exposure to neighborhood violence is associated with youth substance use, including marijuana use (Copeland-Linder et al., 2011; Lambert et al., 2004). In these studies, neighborhood violence is conceptualized as a contextual effect. Thus, individuals do not have to experience violence directly to be negatively influenced by these social contexts. Similarly, even if sexual minority youth are not personally targets of LGBT hate crimes, living in neighborhoods with a greater prevalence of such crimes may nevertheless create a negative social climate for these individuals, contributing to increased levels of stress (Hatzenbuehler et al., 2011; Oswald et al., 2010). In turn, young sexual minorities may use marijuana and other substances to manage that stress (Boardman et al., 2001; Low et al., 2012). Based on this literature, we hypothesized that current marijuana use and other illicit drug use among sexual minority youth would be higher in neighborhoods with more LGBT hate crimes. To test this hypothesis, we obtained data on LGBT hate crimes from the Boston Police Department Community Disorders Unit and linked this information to individual-level data on drug use and sexual orientation from a population-based sample of Boston youth.

## 2. Methods

### 2.1. Sample

Individual-level data come from the 2008 Boston Youth Survey (BYS) Geospatial Dataset, which includes 9th–12th grade students in the Boston Public Schools system who took the BYS and provided their complete residential address (Azrael et al., 2009; Duncan et al., 2012, 2013). Similar to the percentage of those schools included in the BYS survey (Green et al., 2011), approximately 74% of Boston Public School students in the 2007–2008 academic year were eligible for free or reduced-price meals and are racial/ethnic minority (i.e., Black or Hispanic). Schools that served adults, students transitioning back to school after incarceration, suspended students and students with severe disabilities were ineligible. A total of 22 eligible public high schools in Boston participated in the 2008 BYS (32 schools were eligible). The primary reason for school non-participation was scheduling difficulties. Participating and non-participating eligible schools did not have statistically significant differences in key school characteristics (e.g., racial/ethnic composition of students, drop-out rates, standardized test scores, student mobility rate). A list of unique classrooms within each participating school was obtained to generate the classroom-level sample, stratified by grade. Classrooms were randomly selected for survey administration. Every student within the selected classrooms was invited to participate. Selection of classrooms continued until approximately 100–125 students had been sampled per school. The survey was administered to students by trained staff in the spring of 2008 during 50-min class periods. Passive consent was sought from parents and students were read a statement regarding assent prior to survey administration. Of the 2725 students enrolled in the classrooms selected for participation, 1878 (response rate = 68.9%) completed a survey. Most non-participants (85.5%) were absent from school on the day of survey administration. We obtained and geocoded complete address information to the nearest intersection from 68.8% of the Boston students who took the survey ( $n = 1292$ ). The Human Subjects Committee at the Harvard School of Public Health approved the original study.

## 2.2. Measures

**Sexual orientation**—The sexual orientation item used in this study asked respondents to identify one of six categories that best described themselves: (a) completely heterosexual, (b) mostly heterosexual, (c) bisexual, (d) mostly homosexual, (e) completely homosexual (i.e., gay or lesbian), or (f) not sure. This sexual orientation item has been validated and used among youth in several other studies (Austin et al., 2008; Berlan et al., 2010). Among the geospatial sample, 1170 youth (90.6%) indicated that they were heterosexual; 35 (2.7%) were mostly heterosexual; 37 (2.9%) were bisexual; 2 (0.2%) were mostly homosexual; 16 (1.2%) were gay or lesbian; and 18 (1.4%) were unsure of their sexual orientation. 14 respondents (1.1%) did not answer the sexual orientation item. There were no sexual orientation differences between youth who provided their complete intersection residential address and youth who did not ( $X^2 = 0.2853, p = 0.5932$ ), suggesting no geographic selection bias by sexual orientation. In this study, we defined sexual minority orientation ( $n = 108$ ) as those who indicated they were mostly heterosexual, bisexual, mostly homosexual, and gay or lesbian, or unsure, given the small number of non-heterosexual respondents in each category. We included the “mostly heterosexual” and “unsure” groups to increase statistical power, consistent with previous youth research with small sample sizes of sexual minorities (Garofalo et al., 1999; Marshal et al., 2009; McLaughlin et al., 2012; Mustanski et al., 2011; Newcomb et al., 2012). The direction of the results remains unchanged when we remove these groups from the analyses.

**Marijuana use and any other illicit drug use**—The Boston Youth Survey included two items about past-month use of marijuana and other illicit drugs, which were adapted from the 2005 Youth Risk Behavior Surveillance System (YRBS) survey. Respondents were asked, “In the past 30 days, on how many days did you use marijuana?” and “In the past 30 days, on how many days did you use any illegal drug, other than marijuana? (*For example, meth, heroin, cocaine, crack, ecstasy, or LSD*).” Response options for both items included “none”, “1–2”, “3–9”, and “10 or more” days, from which we created a dichotomous variable to reflect no use vs. any past-month use. The drug use items have demonstrated good test–retest reliability, including the marijuana use item ( $\kappa = 70.8$ ; Brener et al., 1995).

**LGBT hate crime incidents**—We geocoded the street location address for hate crime incidents related to minority sexual orientation and non-conforming gender identity from January, 2005 to December, 2008, which we obtained from the Boston Police Department Community Disorders Unit. We requested multiple years of lesbian, gay, bisexual and transgender (LGBT) hate crime data, which is a common approach in criminology (Deane et al., 2008; Messner et al., 2004; Morenoff et al., 2001; Papachristos et al., 2011). Specifically, we requested and obtained three years of LGBT hate crime data because it creates a more stable measure of the construct (increasing construct validity about the neighborhood’s context), and because it increases statistical power, given the relatively small number of LGBT hate crimes in any given year. There were 210 incidents of LGBT hate crimes and 208 were correctly geocoded (99.1%). The geocoded hate crime data also included key characteristics (e.g., police district, date of incident, victim bias, perpetrator race and LGBT crime type) of all reported LGBT hate crimes in the city of Boston during that time period. LGBT crime types included: threats (22.1%); harassment (30.8%); assault or assault and battery (25.5%); and assault or assault and battery by means of dangerous weapon (21.6%). We analyzed the geocoded assault hate crimes data ( $n = 98$ ) in the present study, because (1) sexual orientation hate crimes are more likely to be violent and to involve weapons than other types of hate crimes, including hate crimes that are race-related (Dunbar, 2006; Stacey, 2011), and (2) assaults (with and without weapons) represent the most acute and physically violent forms of LGBT hate crimes.

LGBT assault hate crimes reported from 2005 to 2008 were divided by the total population (based on census block group data from the 2010 U.S. Census, whereby values across block groups were weighted proportionately by each block group's area within the defined buffer). LGBT assault hate crimes per 100,000 population are reported (hate crime rate formula:  $[\text{crime incidents}/\text{total population}] \times 100,000$ ). In this study, the LGBT assault hate crime rates were calculated for each youth based on 400- and 800-meter street network buffers. The street network buffers were created from StreetMap streets excluding highways and ramps using the ArcGIS Network Analyst Extension. The street network buffers consisted of 50-meter buffers around street center lines that extend along the network 400- and 800-meters from the geocoded residential addresses (which are approximately 1/4 and 1/2 mile, respectively).

### 2.3. Statistical analyses

Analyses include only youth who answered the sexual orientation and past-month substance use items ( $n = 1198$ ; approximately 93% of the total geospatial sample). In our analysis, we first computed descriptive statistics for sociodemographic characteristics of the study sample and examined group differences in substance use to compare sexual minority and heterosexual youth. Second, Wilcoxon–Mann–Whitney tests and corresponding  $p$ -values were computed to assess differences in substance use by neighborhood-level LGBT assault hate crime rate among sexual minority youth ( $n = 103$ ). We present means of LGBT hate crime rates by past-month marijuana use to show the direction of association. This analytic approach was chosen over multivariate regression analyses because of the small sample size of sexual minority youth. In the context of a small sample size, odds ratios may be inflated when conducting multivariate regression analyses (Greenland et al., 2000; Nemes et al., 2009). Moreover, because preliminary analyses indicated no spatial dependence in adolescent drug use among sexual minorities (marijuana use: Global Moran's  $I$ :  $-0.0064$ ,  $p = 0.5540$ ; other illicit drug use: Global Moran's  $I$ :  $-0.0333$ ,  $p = 0.3840$ ), and minimal within-school clustering of drug use (marijuana use: Intra-class Correlation Coefficient: 0.19; other illicit drug use: Intra-class Correlation Coefficient: 0.09), spatial and multi-level models were deemed unnecessary.

Third, we ran two tests to examine specificity of the study results: (1) we examined associations between substance use and neighborhood-level LGBT assault hate crime rates for heterosexual youth ( $n = 1095$ ); and (2) we examined whether substance use among sexual minority youth was higher in neighborhoods with higher overall crime rates (i.e., neighborhoods with higher crimes rates that were unrelated to LGBT hate crimes). For this second analysis, we examined both overall crime rates (a combination of property and violent crimes;  $n = 31,254$ ) as well as the specific types of crime (i.e., property and violent crimes) from the year 2007. All analyses for specificity were conducted using Wilcoxon–Mann–Whitney tests. Documenting that LGBT assault hate crimes were associated with marijuana use among sexual minority (but not heterosexual) youth would provide evidence for specificity of the results. Further evidence for specificity would be provided if we were to document that substance use among sexual minority youth was higher in neighborhoods with more LGBT assault hate crimes, but not in neighborhoods with more violent and property crimes.

All  $p$ -values were two-sided with an alpha level of 0.05. Data analysis was performed using SAS version 9.3.

## 3. Results

Table 1 presents the socio-demographic characteristics of the study sample. Sexual minority youth were significantly more likely than heterosexual youth to report past 30-day marijuana



use and past 30-day illicit drug use. Approximately one-third of the sexual minority youth reported past-30 day marijuana use, compared to 18.4% of their heterosexual peers ( $X^2 = 12.82, p < 0.01$ ). Moreover, nearly 10% of the sexual minority sample reported other illicit drug use in the past 30 days, compared to only approximately 2% of the heterosexual sample ( $X^2 = 19.29, p < 0.01$ ).

While there was no significant relationship between past 30-day illicit drug use and LGBT assault hate crimes in the neighborhoods of sexual minority youth, sexual minority youth who reported past 30-day marijuana use were more likely to live in neighborhoods with greater LGBT assault hate crime rates (Table 2). Specifically, sexual minority youth who reported past 30-day marijuana use had a higher rate of assault-based LGBT hate crimes for their 400-meter buffer (23.70 vs. 12.85 per 100,000,  $p = 0.0440$ ). No significant association was found between neighborhood-level LGBT assault hate crimes and marijuana use among sexual minority youth for the 800-meter buffer.

### 3.1. Specificity tests

We found no significant associations between neighborhood-level LGBT hate crimes and marijuana use among heterosexual youth ( $p > 0.05$ ). In addition, no associations were observed between neighborhood-level non-LGBT crimes and marijuana use among the sexual minority youth ( $p > 0.05$ ). These results from the specificity tests not only demonstrate that the association between neighborhood-level LGBT assault hate crime and recent marijuana use is specific to sexual minority youth, but also that this association is specific to LGBT assault hate crimes.

## 4. Discussion

Similar to the results of our study, previous epidemiologic research has documented the existence of sexual orientation disparities in illicit drug use (Marshal et al., 2008); however, there is a noted dearth of research into the determinants of these disparities (IOM, 2011). In a population-based sample of Boston public high school students, we found a greater prevalence of current marijuana use among sexual minority youth who had a higher LGBT assault hate crime rate in their neighborhood. With few exceptions (Buttram and Kurtz, 2013; Carpiano et al., 2011; Hatzenbuehler et al., 2011), studies have rarely examined neighborhood-level risk factors for substance use among sexual minorities (and none have examined neighborhood factors in marijuana use or other illicit drugs among youth), highlighting the novelty of the present study. Findings from these previous studies with adults have been mixed regarding the effects of neighborhood factors on substance use among sexual minority populations. One study (Buttram and Kurtz, 2013) found that gay neighborhood residence was associated with multiple drug use outcomes, including recent cocaine use and substance dependence, but not with marijuana use. Future studies are needed to better understand relationships between various neighborhood factors and substance use outcomes in sexual minority youth and adults.

Despite the large sample size of heterosexual respondents ( $n = 1095$ ), we found no associations between LGBT assault hate crimes and marijuana use among the heterosexual sample, providing evidence for result specificity. In addition, marijuana use among sexual minority respondents was not more likely to occur in neighborhoods with greater overall property and violent crimes, suggesting the results were specific to LGBT assault hate crimes. However, the number of overall violent and property crimes ( $n = 31,254$ ) was much larger than the LGBT assault hate crimes ( $n = 98$ ). Thus, we have far greater statistical power to detect associations between marijuana use and overall crime than between marijuana use and LGBT assault hate crimes among sexual minority youth, and yet found no associations between overall crimes and marijuana use among sexual minority youth. The

lack of significance found in the relationship between illicit drug use and LGBT assault hate crimes among sexual minority youth may be due to the low prevalence of illicit drug use among sexual minority youth in the sample.

These results raise several important questions for future inquiry. In particular, research is needed to identify mechanisms linking neighborhood-level LGBT assault hate crimes to marijuana use among sexual minority youth. One possibility is a stress and coping pathway. For instance, neighborhoods with higher LGBT assault hate crimes signal that sexual minorities are acceptable targets of violence, reflecting (and potentially creating) negative social climates for sexual minority youth. Such environments may present significant stressors, which in turn may lead to marijuana use as a coping strategy (Turner et al., 2013). This stress and coping pathway is consistent with previous studies documenting relationships between social stress, coping, and marijuana use (Boardman et al., 2001; Bonn-Miller et al., 2007; Bujarski et al., 2012; Low et al., 2012).

In addition, none of the intervention guidelines of the main medical and public health institutions (e.g., the American Medical Association) currently provides information on the prevention of substance use, including marijuana, among sexual minority youth (Marshall et al., 2008). The development of effective preventive interventions to reduce sexual orientation disparities in adolescent marijuana and other illicit drug use therefore represents another critical area for future research.

#### 4.1. Limitations and strengths

These results should be considered in the context of the study's limitations. Our sample is composed of public high school students in one urban school district, and the youth included are disproportionately low-income and from racial/ethnic minority groups. Consequently, generalizability of our results to other locations and to a broader population of sexual minority youth, including transgender youth (who were not assessed in the BYS), may be limited. Because sexual minorities are more likely than their heterosexual peers to skip school as a result of feeling unsafe (DuRant et al., 1998), it is possible that sexual minority students were disproportionately absent on the day of BYS data collection. However, this potential selection bias would likely lead to an underestimation of the association between neighborhood-level LGBT assault hate crimes and marijuana use among sexual minority youth.

There are several limitations related to the small sample size of sexual minority youth. This hindered our ability to stratify analyses by socio-demographic characteristics (e.g., race/ethnicity and gender) or by type of sexual minority status (e.g., bisexuals), which could obscure subgroup differences. In addition, the small sample size of sexual minorities precluded us from conducting multivariate regression analyses where we could control for potential confounders. We were able to show that the results were likely not confounded by neighborhood-level crime. Nevertheless, future studies with larger samples are needed to be able to control for a wide array of potential confounders.

Unfortunately, the Boston Youth Survey also did not include information on residential history or residential duration. Therefore, a limitation of the study is the inability to account for residential duration. Finally, given the cross-sectional design, temporal ordering of the relationships between LGBT assault hate crimes and sexual minority marijuana use cannot be established. Prospective designs are needed to address issues of causality.

There are also limitations with the LGBT assault hate crimes data. Because the specific incident location (i.e., exact street address location) was not often available in the police records, we relied on geocoded street-level information for most LGBT assault hate crimes,

which can result in local misclassification. However, because all hate crime incidents occurred within the city of Boston, location misclassification is likely to be minimal, as Boston generally has a dense street network with small block sizes. Additionally, hate crimes are typically under-reported to police departments (Green et al., 2001; Harlow, 2005), but this reporting bias would underestimate the LGBT assault hate crimes and marijuana use association. Our results therefore likely provide a conservative estimate of the association between LGBT assault hate crimes and marijuana use among sexual minority youth.

Despite these limitations, there are a number of methodological strengths in the current study. First, by utilizing Geographic Information System (GIS) methods to study social determinants of sexual minority health, this study extends previous research with sexual minority populations, which has rarely used GIS methods. Second, most studies of sexual minority health rely on self-report assessments of both the exposure (i.e., neighborhood constructs such as perceived safety) and the outcome (e.g., marijuana use), which can introduce same-source bias (Diez Roux, 2007). In contrast, the current study used an objective measure of neighborhood stress (i.e., LGBT assault hate crimes using police record data), which addresses same-source bias. Additionally, the spatial unit of analysis likely matters in neighborhood health research; however, crime data is usually aggregated to an administrative unit (e.g., census tract or police district), which may not be a meaningful neighborhood definition for youth (Matthews, 2011). In contrast, the current study used ego-centric neighborhood definitions, which are increasingly believed to provide more relevant neighborhood-level measures than administrative units (Matthews, 2011), for determining LGBT assault hate crime rates. Furthermore, the BYS sample is largely comprised of low-income and racial/ethnic minority youth, which are typically under-represented in the literature on sexual minority health (IOM, 2011). We also utilized data from a population-based sample of youth, which overcomes the limitations of many sexual minority health studies that are based on samples derived from convenience sampling techniques (e.g., studies that recruit participants through sexual minority community settings) that may introduce sampling biases (Meyer and Wilson, 2009). The youth were also not sampled on the basis of previous drug use; as such, this study is not vulnerable to biases associated with recruitment based on drug use.

## 4.2. Conclusions

To our knowledge, this is the first study investigating relationships between neighborhood factors and illicit drug use among sexual minority youth. We found a significantly greater prevalence of marijuana use among sexual minority youth in neighborhoods with a higher prevalence of LGBT assault hate crimes. These relationships were not observed in heterosexual youth, and among sexual minority youth, results were specific to LGBT assault hate crimes (no associations were found with the overall crime rate), providing initial evidence for the specificity of the study results. Our results highlight the role that the neighborhood environment may play in contributing to sexual orientation-related disparities in youth marijuana use, and raise important questions for future study on social determinants of substance use among sexual minority populations.

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**Table 1**

Sample characteristics and illicit drug use, 2008 Boston Youth Survey Geospatial Dataset.

	Sexual minority ( <i>n</i> = 103)	Heterosexual ( <i>n</i> = 1095)	<i>T</i> -value or $\chi^2$ statistic
Age in years (mean, SD)	16.23 (1.28)	16.33 (1.27)	<i>t</i> -value = -0.72 ( <i>p</i> = 0.4764)
<i>Gender (%)</i>			$\chi^2 = 24.31$ ( <i>p</i> < 0.0001)
Male	21.36	46.61	
Female	78.64	53.39	
<i>Race/ethnicity (%)</i>			$\chi^2 = 5.55$ ( <i>p</i> = 0.2358)
White, Non-Hispanic	12.75	9.93	
Black, Non-Hispanic	32.35	43.63	
Hispanic	38.24	32.21	
Asian	6.86	7.21	
Other	9.80	7.02	
<i>Nativity status (%)</i>			$\chi^2 = 1.05$ ( <i>p</i> = 0.3049)
US Born	77.67	73.00	
Foreign Born	22.33	27.00	
<i>Marijuana use (%)</i>			$\chi^2 = 12.82$ ( <i>p</i> = 0.0003)
Yes	33.01	18.36	
No	66.99	81.64	
<i>Other illicit drug use (%)</i>			$\chi^2 = 19.29$ ( <i>p</i> < 0.0001)
Yes	9.71	2.19	
No	90.29	97.81	

*Note.* Descriptive statistics presented are for youth who completed the two past-month illicit drug use item (*n* = 1198).



**Table 2**

Mean residential neighborhood LGBT hate crime assault rate by illicit drug use among sexual minority youth, 2008 Boston Youth Survey Geospatial Dataset ( $n = 103$ ).

	<b>Marijuana use</b>		
	<b>No</b>	<b>Yes</b>	<b><i>p</i>-value</b>
400-meter buffer	12.85	23.70	0.0440
800-meter buffer	15.11	17.14	0.6943
	<b>Other illicit drug use</b>		
	<b>No</b>	<b>Yes</b>	<b><i>p</i>-value</b>
400-meter buffer	15.22	23.77	0.1864
800-meter buffer	15.25	20.77	0.3595

*Notes.* LGBT assault hate crime rates expressed as per 100,000 population. Two-sided *p*-values based on the Wilcoxon two-sample test are reported.