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Sex partner meeting places over time among newly HIV diagnosed men who have sex with men (MSM) in Baltimore, Maryland

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Abstract

Background—Sex partner meeting places may be important locales to access men who have sex with men (MSM) and implement targeted human immunodeficiency virus (HIV) control strategies. These locales may change over time, but temporal evaluations have not been performed.

Methods—The objectives of this study were to describe the frequency of report of MSM sex partner meeting places over time, and to compare frequently reported meeting places in the past five years and past year among newly HIV diagnosed MSM in Baltimore City, Maryland. Public health HIV surveillance data including partner services information was obtained for this study from the Baltimore City Health Department from May 2009 to June 2014.

Results—869 sex partner meeting places were reported, including 306 unique places. Bars/clubs (31%) and internet-based sites (38%) were the most frequently reported meeting place types. Over the five year period, the percentage of bars/clubs decreased over time and the percentage of internet-based sites increased over time. Among bars/clubs, 4/5 of those most frequently reported in the past five years were also most frequently reported in the most recent year. Among internet-

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based sites, 3/5 of those most frequently reported in the past five years were also in the top five most frequently reported in the past year.

Conclusion—This study provides a richer understanding of sex partner meeting places reported by MSM over time and information to health departments on types of places to access a population at high risk for HIV transmission.

Keywords

men who have sex with men; HIV; sex partner meeting places; HIV transmission; HIV control

Introduction

New human immunodeficiency virus (HIV) prevention and control strategies have emerged, such as pre-exposure prophylaxis (PrEP), suggesting that there is now more than ever an imperative to identify populations most at risk for transmitting and acquiring HIV. While the number of persons diagnosed with HIV from 2009 to 2011 in the U.S. decreased, the number of persons with infection attributable to male-to-male sexual contact remained stable overall and increased among males ages 13–24, 45–54 and 55 years or older (1). Among metropolitan statistical areas (MSAs), Baltimore City-Columbia-Towson, Maryland ranks third among MSAs with the highest estimated rate of new diagnoses of HIV (2, 3). According to the National HIV Behavioral Surveillance System (NHBS) in 2011, an estimated 43% of Baltimore City's MSM are infected with HIV (4). The rate of undiagnosed infections among MSM in Baltimore City is estimated to be 31%, the second highest among NHBS cities surveyed (4). In response to the epidemic, the Baltimore City Health Department (BCHD) implemented viral load testing in late 2012 for individuals at the point of HIV diagnosis. The results suggest that among those with a detectable viral load, the greatest proportion were attributable to MSM compared to other subpopulations such as injection drug users and high risk heterosexuals (5).

Given that the epidemiology suggests detectable viral loads and ongoing transmission among MSM, strategies to access MSM, and particularly those at high risk for transmission and acquisition, are critical. Sex partner meeting places may be important locales to access MSM in order to implement targeted HIV control strategies (6–11). Sex partner meeting places are defined as locations or places (e.g. internet sites, clubs, bars, streets, houses, etc.) where MSM report meeting sex partners. While there has been prior research in this area for MSM (12, 13), less is currently known about how the utilization of these places has changed over time and whether there are new and emerging places. Understanding the extent to which meeting places change over time and are new and emerging is important to maintain the relevance and effectiveness of HIV control strategies. The use of social networking internet sites and applications to meet sex partners, for example, has increased across all age groups and particularly among young MSM. (8, 10, 12, 14–20). Whether and how to incorporate these places for targeted control strategies is yet unknown.

The goal of these analyses were to provide information to local health departments for use in targeted HIV control strategies. The objectives of these analyses were to describe the frequency of report of MSM sex partner meeting places over time, and to compare

frequently reported meeting places in the past five years and in the past year among newly HIV diagnosed MSM in Baltimore City, Maryland.

Materials and Methods

Overview

Data for this study were collected as part of an innovative demonstration project funded by the Centers for Disease Control and Prevention (CDC) designed to use enhanced public health surveillance data to reduce HIV transmission and HIV-related health disparities in Baltimore City. The Institutional Review Board at the Johns Hopkins School of Medicine approved this study.

Study population

For this study, we used BCHD HIV public health surveillance data including partner services data of newly HIV diagnosed MSM living in Baltimore City and diagnosed from May 2009 to June 2014. Cases were considered to be MSM if during the course of HIV testing or a partner services interview they 1) self-identified as gay/bisexual or 2) reported having sex with men. New diagnoses are routinely defined by the BCHD as no prior report of HIV infection in either the BCHD's HIV/STD morbidity registry or Maryland's Department of Health and Mental Hygiene's Enhanced HIV/AIDS Reporting System database (eHARS).

Measures

Demographic data, such as age and race, were collected from the provider and laboratory standard morbidity reports. Self-reported age was measured as a continuous variable and race was defined as Black, White, or Other. Information on the number of sex partners in the past 12 months (continuously measured) was obtained through face-to-face semi-structured interviews with disease intervention specialists (DIS), as a part of partner services. Individuals were also asked to report sexual and drug risk behaviors including injection drug use (yes, no) or whether they have engaged in commercial sex work in the past 12 months (yes, no). In addition, DIS collected information on sex partner meeting places. Individuals were asked to report the places or venues where they met their sex partners in the past 12 months. Reporting of this information was not restrictive in terms of the total number of venues. We classified these venues into the following venue types based on input from DIS and internet searches of venue names: bars/clubs, internet-based sites (e.g. websites, chat sites, phone apps), market/mall, schools/parks/neighborhoods, residential location (e.g. my house, his/her house, friend's house) and other or unidentifiable locations.

Statistical Analyses

For descriptive analyses and hypothesis testing, all analyses were performed using Stata (Stata Intercooled, version 12.1, Stata Corp. LP, College Station, TX) and all statistical tests with p-values of < 0.05 were considered to be statistically significant. Individuals reporting a sex partner meeting place were compared to those not reporting using chi-squared tests or t-tests, as appropriate. Summary statistics were generated to describe the frequency of report of sex partner meeting types over the study time period by unique venue report and by

frequency of report in six-month intervals. We also compared the top five sex partner meeting places in the past five years and in the past year among the two most frequently reported types (bars/clubs and internet-based sites) and calculated the percent of reports these five places yielded as potentially stable sites for control strategies.

Results

From May 2009 to June 2014, 764 MSM were newly diagnosed with HIV. Among the 764, 54% (412) provided information on at least one sex partner meeting place. Those not providing meeting place information compared to those providing information were similar by race, self-report of IDU or CSW in the past 12 months, and by year of report. Those not providing information were significantly older (mean 30.6 years [Standard Deviation (SD) 11.02]) and had fewer numbers of sex partners in the past 12 months (mean 2.1 [SD 2.67] (Table 1).

Among the 412 MSM reporting at least one sex partner meeting place, 83.3% were African American, their average age was 28.2 years (SD 9.22), the average reported sex partners in the past 12 months was 4.4 (SD 11.91) and 1.5% self-reported IDU and 4.6% self-reported CSW in the past 12 months (Table 1). A total of 869 sex partner meeting places were reported over the five-year study time period, including 306 unique places. The average number of sex partner places reported by MSM was 2.1 (SD 1.6) with a range of 1 to 11 reported places (*data not shown*). Among the 869 reports of sex partner meeting places, the frequency of report by sex partner meeting place type was: 38% (332) internet-based sites, 31% (272) bars/clubs, 16% (136) streets/parks/neighborhoods, 3% (26) market/malls, 2% (15) residential locations and 10% (88) other or unidentifiable locations. Among the 306 reports of *unique* sex partner meeting places the frequency of report by type was: 34% (105) streets/parks/neighborhoods, 23% (71) bars/clubs, 13% (41) internet-based sites, 5% (16) market/malls, 3% (8) residential locations and 21% (65) other or unidentifiable locations.

Aggregated into six-month intervals from May 2009 to June 2014, bars/clubs and internet-based sites were the most frequently reported types (Figure 1). Over time the frequencies of reports of bars/clubs decreased starting at 24 in the first half of 2009, peaking at 39 reports in the first half of 2011, and decreasing to 16 in the first half of 2014. Over time, the frequencies of reports of internet-based sites increased starting at 15 reports in the first half of 2009, peaking at 36 reports in the first half of 2011 and ending at 28 reports in the first half of 2014. Reports of schools/parks/neighborhoods started at 10 reports in the first half of 2009, peaked at 20 reports in the first half of 2010 and 2012 and ended at 8 reports in the first half of 2014. Market/malls and residential locations maintained a relatively low frequency of report, which stayed similar over time. Reports of “other venues” increased over time starting at 4 in the first half of 2009, and peaking and ending at 16 reports in the first half of 2014.

Over the five years, the top five bars/clubs represented 141 reports or 52% of bar/club reports and 16% of the total reports (Figure 2). The top five internet-based sites represented 199 reports or 60% of internet-based site reports and 23% of the total reports (Figure 3). In the most recent one year period, the top five bars/clubs represented 124 reports or 46% of

bar/club reports and 14% of the total reports. The top five internet-based site reports represented 175 reports or 53% of internet-based site reports and 20% of the total reports. Comparing the distributions of the top bars/clubs by five years and one year identified three in the top five that were the same. Among the top five internet-based site reports, four of the sites identified in the top five were the same for the five year and one year periods.

Discussion

The HIV epidemic is firmly seated in a number of urban areas in the U.S. and among specific populations such as MSM. A new arsenal of tools, such as PrEP, are emerging to aid in targeted control efforts. These efforts will need to be combined with implementation science to identify, for example, the most effective places to target the interventions. Information regarding sex partner meeting places reported by newly HIV diagnosed MSM, including how these meeting places change over time and the frequency of reports for types of venues, may yield important and emerging places for targeted control interventions.

A total of 869 sex partner meeting places were reported over the five year study time period, including 306 unique places. Bars/clubs and internet-based sites were the most frequently reported sex partner meeting place types. The top five bars/clubs represented more than half of the bars/clubs reported and 16% of reports. The top five internet sites represented more than two-fifths of reports. These results are similar to other studies showing clustering of reports of venues of MSM. Oster et al. (2013), for example, found that young black MSM reported socializing and meeting sex partners at a few urban venues (7).

Frequency of report of sex partner meeting place types over time suggested some variability. The frequency of reports of bars/clubs decreased while internet-based site reports increased over the five years. Among bars/clubs, four of the five most frequently reported over the five years were also in the top five most frequently reported in the most recent year; while among internet-based site reports, three of the five most frequently reported sites over the five years were also in the top five most frequently reported in the most recent year. These data suggest that patterns in sex partner meeting place types overall may be changing. This trend is reflected in reports from outreach workers at the BCHD (*personal communication*) and by the growing number of research studies investigating the internet as an emerging MSM sex partner meeting venue (8, 10, 12, 14–20).

There are a number of limitations to the current study. The data were collected as a part of routine activities by the local health department and were not collected for research purposes. This means that the data quality may be less than that of data collected for research resulting in potential for systematic biases in the data collection. In addition, sample sizes may be lower leading to less reliability. The data on sex partner meeting places were self-reported by MSM. The self-report of sensitive information may be limited in the types of meeting places MSM were willing and able to report. In addition, the report of places may be biased toward more recent places versus places that the individual frequented and met sex partners earlier in the year. This bias, however, may be beneficial, as it would favor places with current transmission dynamics to the extent that the transmission dynamics are unstable over time.

Despite these limitations, this study provides a richer understanding of sex partner meeting places reported by MSM over a five year period in one urban setting with a severe HIV epidemic. This work shows the potential value of the collection of sex partner meeting place data for local public health departments as the findings may help to shed light on important places for targeted control activities aimed at interrupting HIV transmission. Collection of this information more broadly may also help in the monitoring of national versus more local trends in sex partner meeting places. Future research should focus on understanding how to identify important new or emerging venues and how to distinguish differences in transmission potential between venues. Critical to this approach will be establishing venue indicators of HIV transmission risk including measures of network connectivity within and between venues where MSM congregate and meet sex partners.

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Summary

A study of MSM sex partner meeting places (Baltimore, MD) suggests that meeting places are changing over time, and venue HIV viral load is not significantly different by venue type.

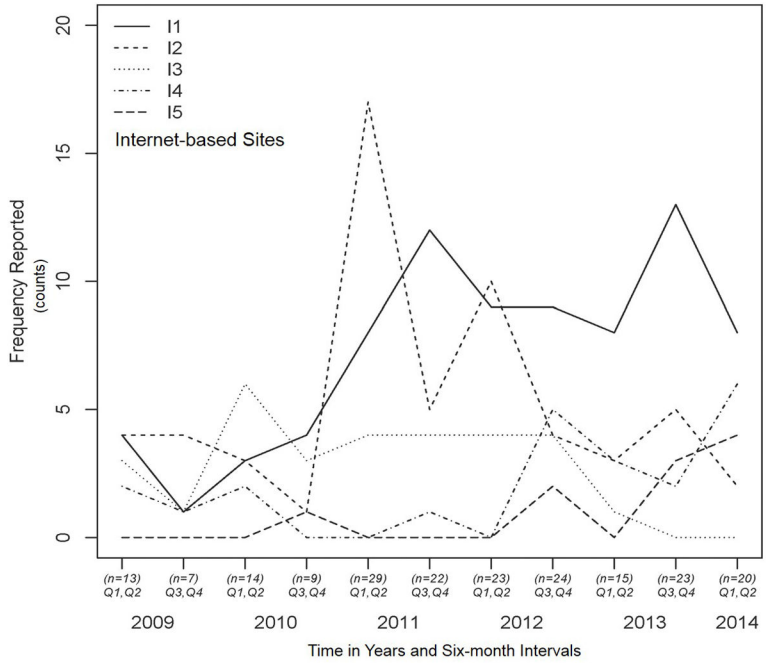

Figure 1.

Frequency (count) of sex partner meeting place types reported by newly HIV diagnosed men who have sex with men (MSM) in Baltimore City from May 2009 to June 2014, in six-month intervals.

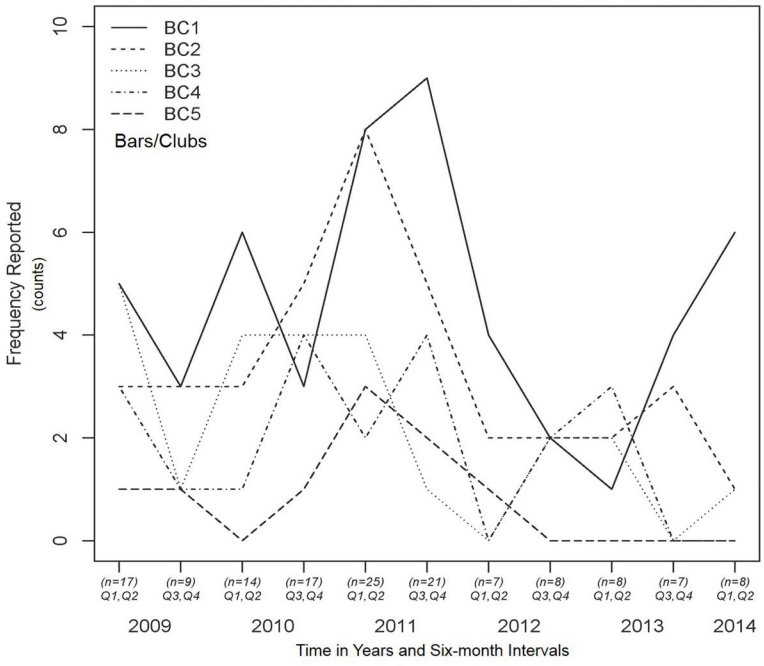

Figure 2.

Five most frequently reported bars/clubs reported as sex partner meeting places by newly HIV diagnosed men who have sex with men (MSM) in Baltimore City, by frequency of report (count) from 2009 to June 2014 in six-month intervals.

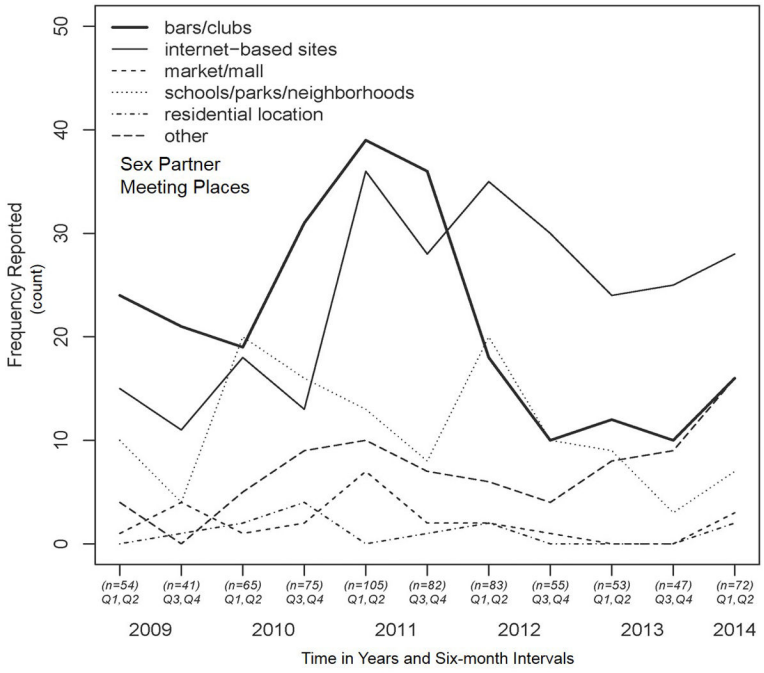

Figure 3.

Five most frequently reported internet-based sites reported as sex partner meeting places by newly HIV diagnosed men who have sex with men (MSM) in Baltimore City, by frequency of report (count) from 2009 to June 2014 in six-month intervals.

Table 1

Demographic characteristics and HIV transmission risk behaviors for newly diagnosed men who have sex with men (MSM), May 2009 to June 2014, Baltimore City (n=764).

	≥ 1 sex partner meeting place (n=412)	**0 sex partner meeting place (n=352)**	**P value**
Demographic characteristics	mean (SD)	mean (SD)	
Age (mean, SD)	28.2 (9.22)	30.6 (11.02)	0.004
Race (%)	n (%)	n (%)	
Black	343 (83.3)	303 (86.1)	0.282
White	43 (10.4)	33 (9.4)	0.626
Latino	19 (1.0)	9 (0.8)	0.132
Other	7 (1.7)	7 (2.0)	0.766
HIV transmission risk behaviors in the past 12 months	mean (SD)	mean (SD)	
Number of sex partners	4.4 (11.91)	2.1 (2.67)	0.004
	n (%)	n (%)	
Injection drug use (IDU)	6 (1.5)	3 (0.9)	0.435
Commercial sex work (CSW)	19 (4.6)	14 (4.0)	0.652