

Venue-Based and On-line Sampling

Patrick S. Sullivan, DVM, PhD
Department of Epidemiology

January 18, 2018



**Center for
AIDS Research**

THE LANCET

HIV in men who have sex with men - July, 2012

www.thelancet.com

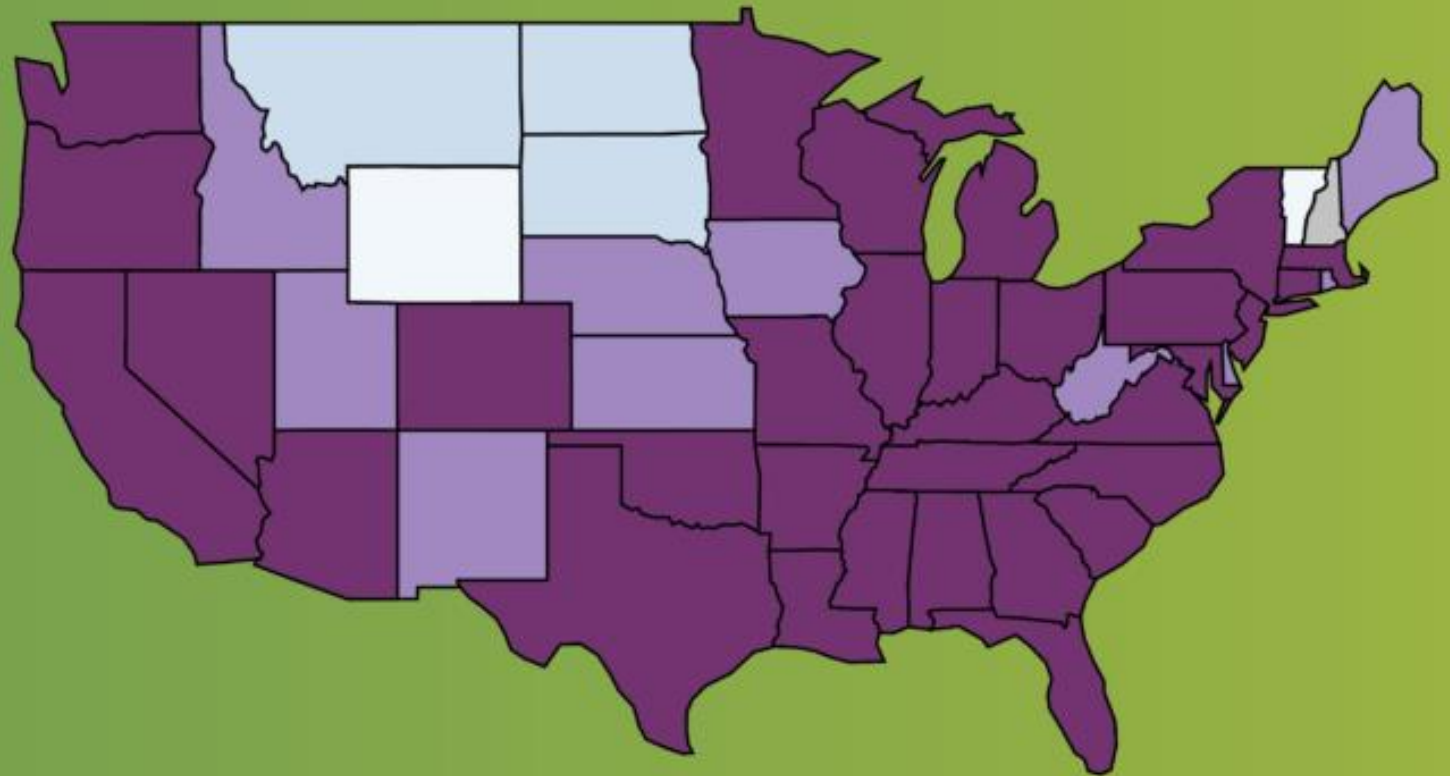


"In much of the world, [men who have sex with men] remain hidden, stigmatised, susceptible to blackmail if they disclose their sexual lives, and criminalised, even in health-care facilities....To address HIV in [these men] will take continued research, political will, structural reform, community engagement, and strategic planning and programming, but it can and must be done."

HIV in men who have sex with men

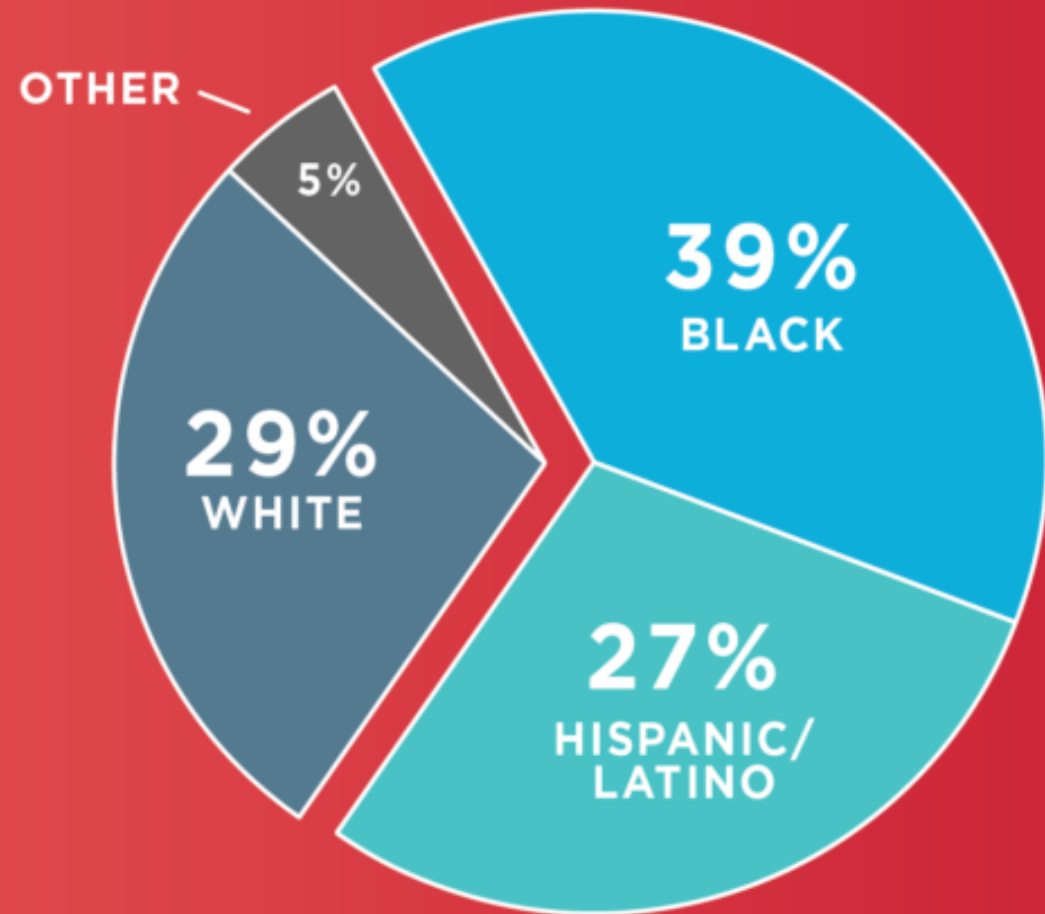
Source: Beyrer, Mayer, Sanchez, Sullivan, Guest eds. Lancet 2012.

**GAY AND
BISEXUAL MEN**
MAKE UP **2%** OF THE
U.S. POPULATION
BUT ACCOUNTED FOR
67% OF ALL NEW
HIV DIAGNOSES IN
THE U.S. IN 2015

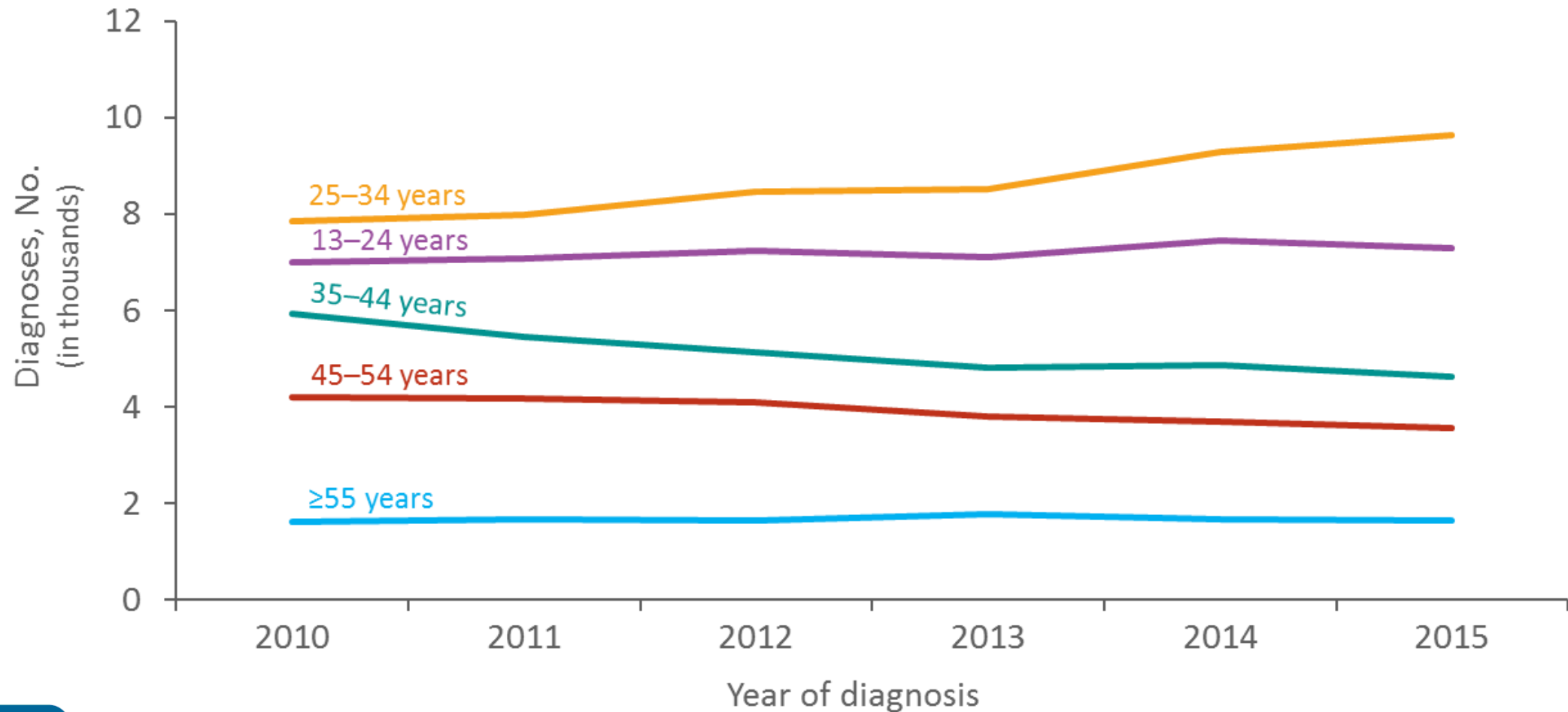


Number of Males Newly Diagnosed with HIV Attributed to Male-to-Male Sexual Contact, 2015

**BLACK AND
HISPANIC/LATINO
MEN ACCOUNTED
FOR TWO-THIRDS
OF ALL GAY AND
BISEXUAL MEN
NEWLY DIAGNOSED
WITH HIV IN 2015**



Diagnoses of HIV Infection among Men Who Have Sex with Men, by Age at Diagnosis, 2010–2015—United States and 6 Dependent Areas



Note: Data have been statistically adjusted to account for missing transmission category. Data on men who have sex with men do not include men with HIV infection attributed to male-to-male sexual contact *and* injection drug use.

How to sample MSM for HIV prevention research?

- Venue-based sampling
- Online sampling – General social media
- Virtual venues (sex-seeking apps)

Surveillance of HIV Risk and Prevention Behaviors of Men Who Have Sex with Men—A National Application of Venue-Based, Time-Space Sampling

DUNCAN A. MACKELLAR, MA,
MPH^a

KATHLEEN M. GALLAGHER, DSc,
MPH^a

TERESA FINLAYSON, MPH^a

TRAVIS SANCHEZ, DVM, MPH^a

AMY LANSKY, PhD^a

PATRICK S. SULLIVAN, DVM,
PhD^a

SYNOPSIS

In collaboration with the Centers for Disease Control and Prevention, participating state and local health departments, universities, and community-based organizations applied venue-based, time-space sampling methods for the first wave of National HIV Behavioral Surveillance of men who have sex with men (NHBS-MSM). Conducted in 17 metropolitan areas in the United States and Puerto Rico from November 2003 through April 2005, NHBS-MSM methods included: (1) formative research to learn the venues, times, and methods to recruit MSM; (2) monthly sampling frames of eligible venues and day-time

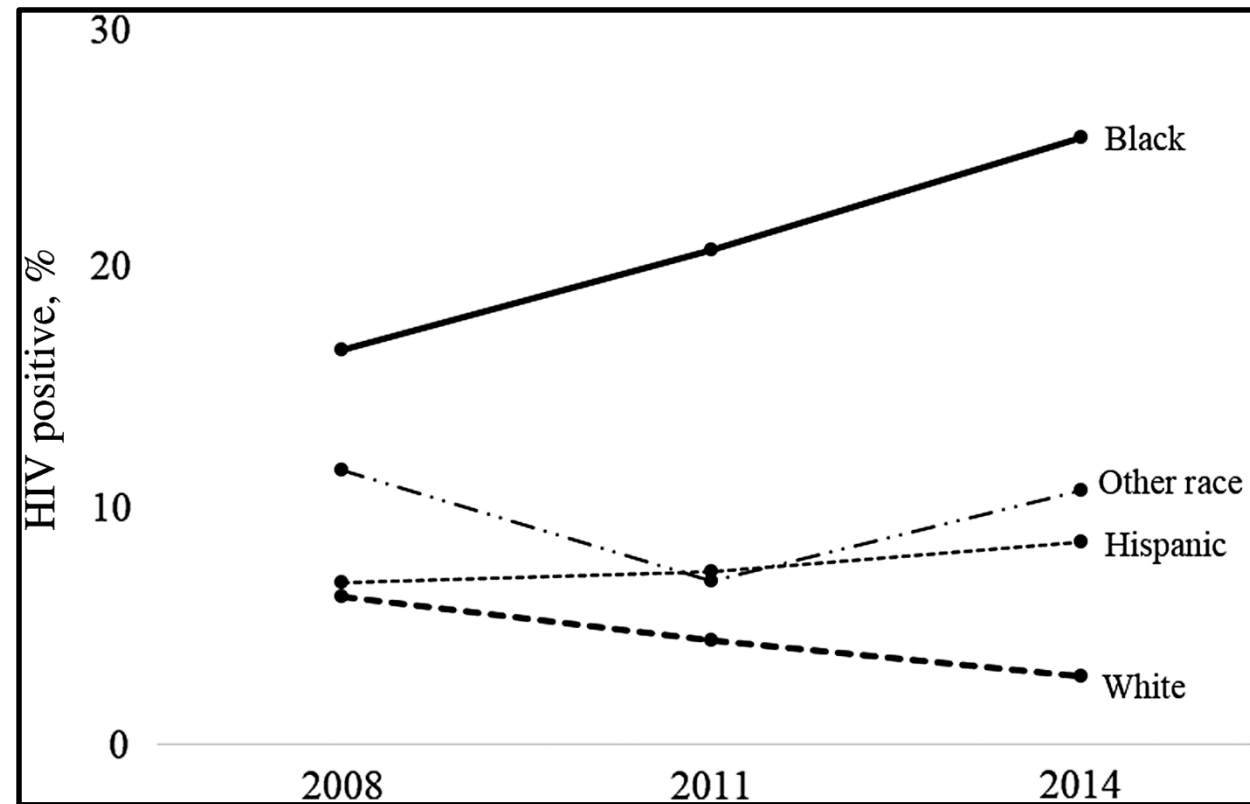
Venue Based Sampling

- Formative work – venue enumeration
- Observations
- Development of venue-day-time periods
- Construction of sampling frame of VDTs
- Development of sampling calendar
- Selection of sample
- Within venues: systematic, flow-based sampling

Figure 2. Hypothetical sampling calendar for venue-based, time-space sampling of MSM

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		1 PRa: O008 7p–10p A1b: S033 A2c: X021	2 PR: O004 8p–9p A1: D052 A2: X002	3	4 PR: D101 11:30p–3:30a A1: S033	5
6	7 PR: Z001 8p–12a A1: S033 A2: X021	8	9 PR: F001 6p–10p A1: C019 A2: C001	10	11 PR: X002 8p–12a A1: D052 A2: C001	12
13	14 PR: R045 6p–10p A1: F001 A2: Z001	15	16	17 PR: D052 8p–12a A1: X021 A2: S033	18 PR: C019 10p–12a A1: D101 A2: S033	19 PR: C001 8p–12a A1: X021 A2: X002
20	21	22 PR: S033 12a–2a	23	24 PR: S001 6p–10p A1: R045 A2: X002	25	26
27 PR: P007 4p–6p A1: X021 A2: C019	28	29	30 PR: X021 6p–10p A1: O004 A2: F001			

Human immunodeficiency virus (HIV) prevalence among 18–24-year-old men who have sex with men (MSM) who were interviewed in 2008, 2011, and 2014, by year of interview, National HIV Behavioral Surveillance, 20 US cities.



From: Age-Specific Race and Ethnicity Disparities in HIV Infection and Awareness Among Men Who Have Sex With Men—20 US Cities, 2008–2014

J Infect Dis. 2015;213(5):776-783. doi:10.1093/infdis/jiv500

Where the boys are ...

JOURNAL OF MEDICAL INTERNET RESEARCH

Delaney et al

Original Paper

Using a Geolocation Social Networking Application to Calculate the Population Density of Sex-Seeking Gay Men for Research and Prevention Services

Kevin P Delaney¹, MPH; Michael R Kramer¹, PhD; Lance A Waller², PhD; W Dana Flanders¹, MD, PhD; Patrick S Sullivan¹, DVM, PhD

¹Department of Epidemiology, Laney Graduate School, Emory University, Atlanta, GA, United States

²Department of Biostatistics and Bioinformatics, Rollins School of Public Health, Emory University, Atlanta, GA, United States

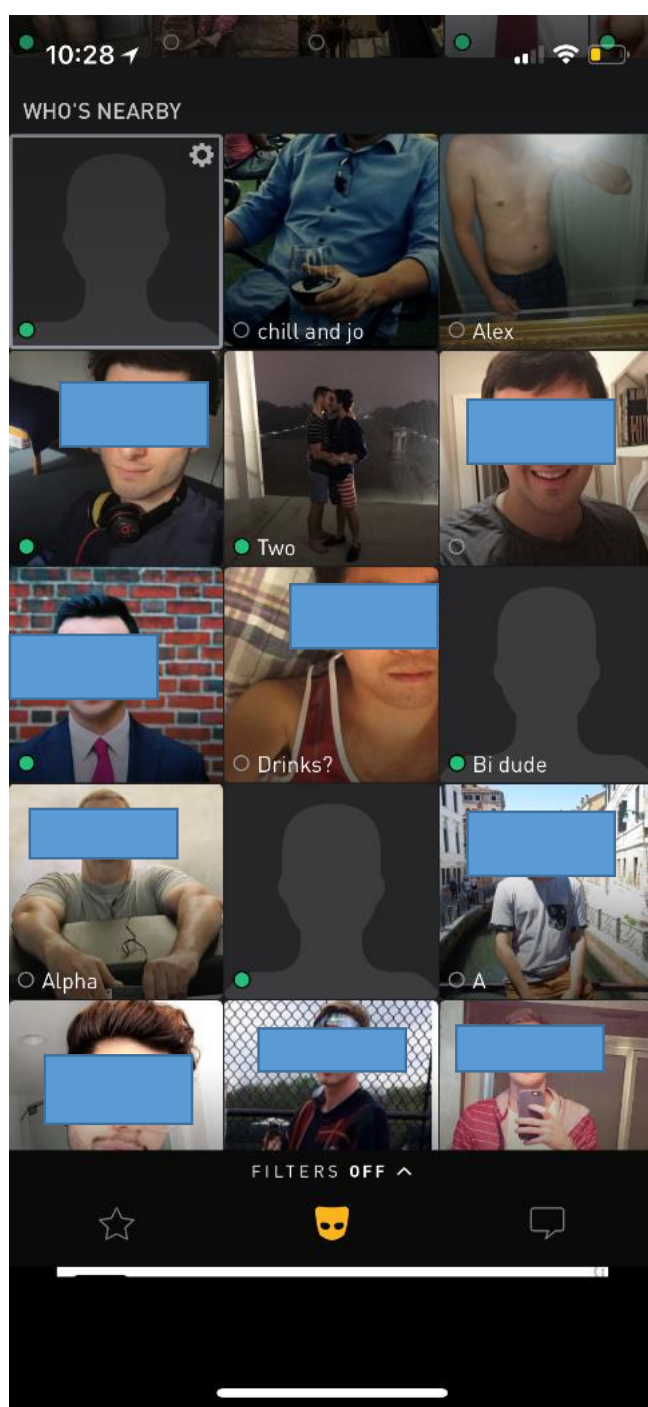
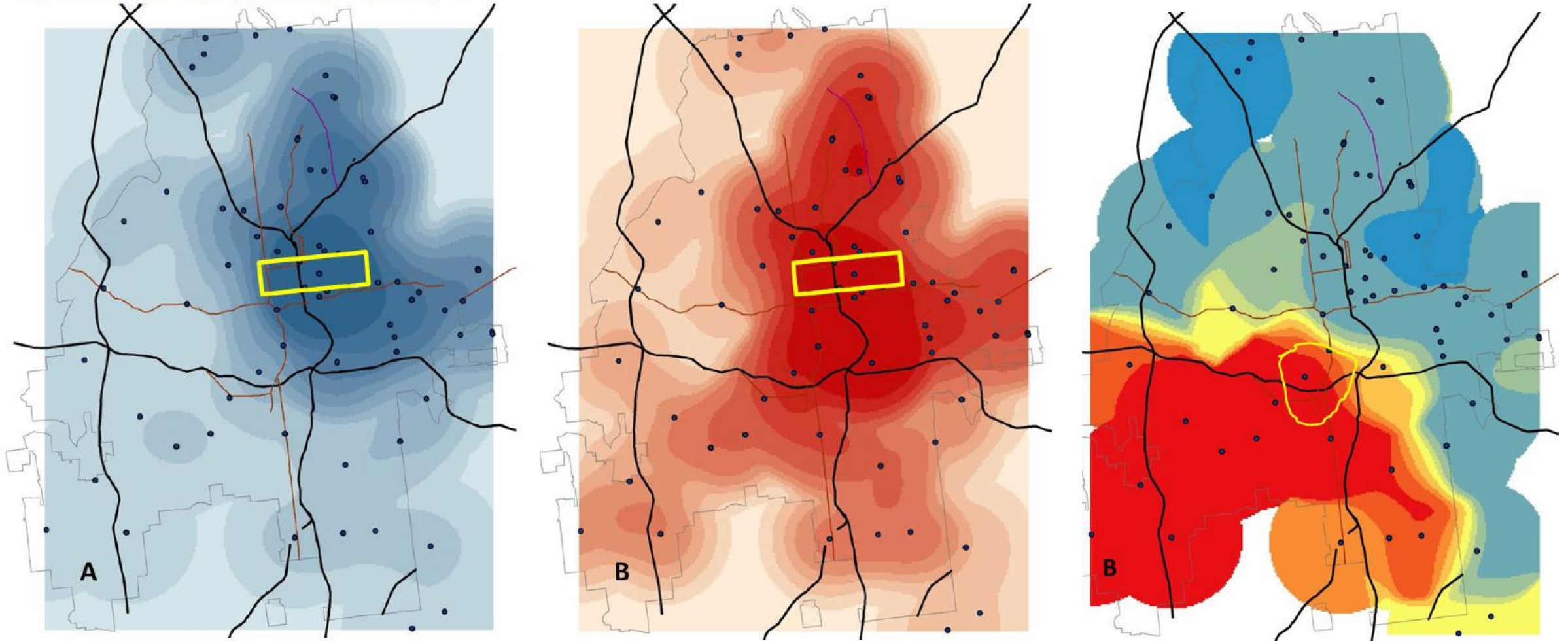


Figure 4. Map of Atlanta showing 79 data collection points from profiles on a sex-seeking networking app; radii of yellow circles represent distance to user sample at the maximum distance from the sample point, and overlapping circles completely cover Atlanta, with smaller circular areas used for data collection where there were the largest numbers of application users.



VBS: Place matters

Figure 6. Estimated density of white (A) and black (B) social network application users in Atlanta (gray outline), showing major highways (black lines) and roads (dark red lines) and highlighting the “Midtown” area of Atlanta (yellow rectangle); kernel densities estimated from sample data standardized to 1-mile circular radii and smoothed to 2 miles using a Gaussian smoother that concentrates the majority of the density at the sample point and averages over all adjacent data points within the smoothing radius.



Source: Delaney et al, *J Med Internet Res* 2014;16(11):e249)

Original Paper

Bias in Online Recruitment and Retention of Racial and Ethnic Minority Men Who Have Sex With Men

Patrick S Sullivan¹, DVM PhD; Christine M Khosropour¹, MPH; Nicole Luisi¹, MPH; Matthew Amsden², MBA; Tom Coggia², BSID MFA; Gina M Wingood³, ScD MPH; Ralph J DiClemente³, PhD MSc

¹Rollins School of Public Health, Department of Epidemiology, Emory University, Atlanta, GA, United States

²Cyclogram, West Hollywood, CA, United States

³Rollins School of Public Health, Department of Behavioral Sciences and Health Education, Emory University, Atlanta, GA, United States

Online studies undersample Black and Hispanic MSM

Table 1. Selected Internet-based HIV prevention studies of men who have sex with men depicting population prevalence from recruitment location, enrolled study population prevalence, and corresponding prevalence ratio of black and Hispanic men

Internet Study	Location	Black Men			Hispanic Men		
		Population Prevalence (%)	Enrolled Prevalence (%)	Prevalence Ratio	Population Prevalence (%)	Enrolled Prevalence (%)	Prevalence Ratio
Grosskopf et al, 2010 [12]	New York City	25.1	17.9	0.71	27.4	13.5	0.49
Chiasson et al, 2009 [11]	United States	12.4	6.3	0.51	15.1	14.2	0.94
Rosser et al, 2009 ^a [13]	United States	12.4	16.4	1.3	15.1	25.1	1.7
Berg et al, 2007 [14]	United States	12.4	2.5	0.20	15.1	1.7	0.11
Mackellar et al, 2007 ^b [15]	6 US cities	25.3	8.6	0.34	30.2	18.8	0.62
Chiasson et al, 2007 [16]	United States and Canada	11.3	4.6	0.41	15.1	7.1	0.57
Bull et al, 2004 ^c [17]	United States	12.4	6.6	0.53	15.1	10.9	0.72
Hirshfield et al, 2004 [18]	United States	12.4	2.0	0.16	15.1	5.5	0.36

Figure 1. Shown are six banner advertisements displaying white (left), black (middle), and Asian (right) models used to recruit potential participants from MySpace.com for an online HIV behavioral risk study in the United States in 2009

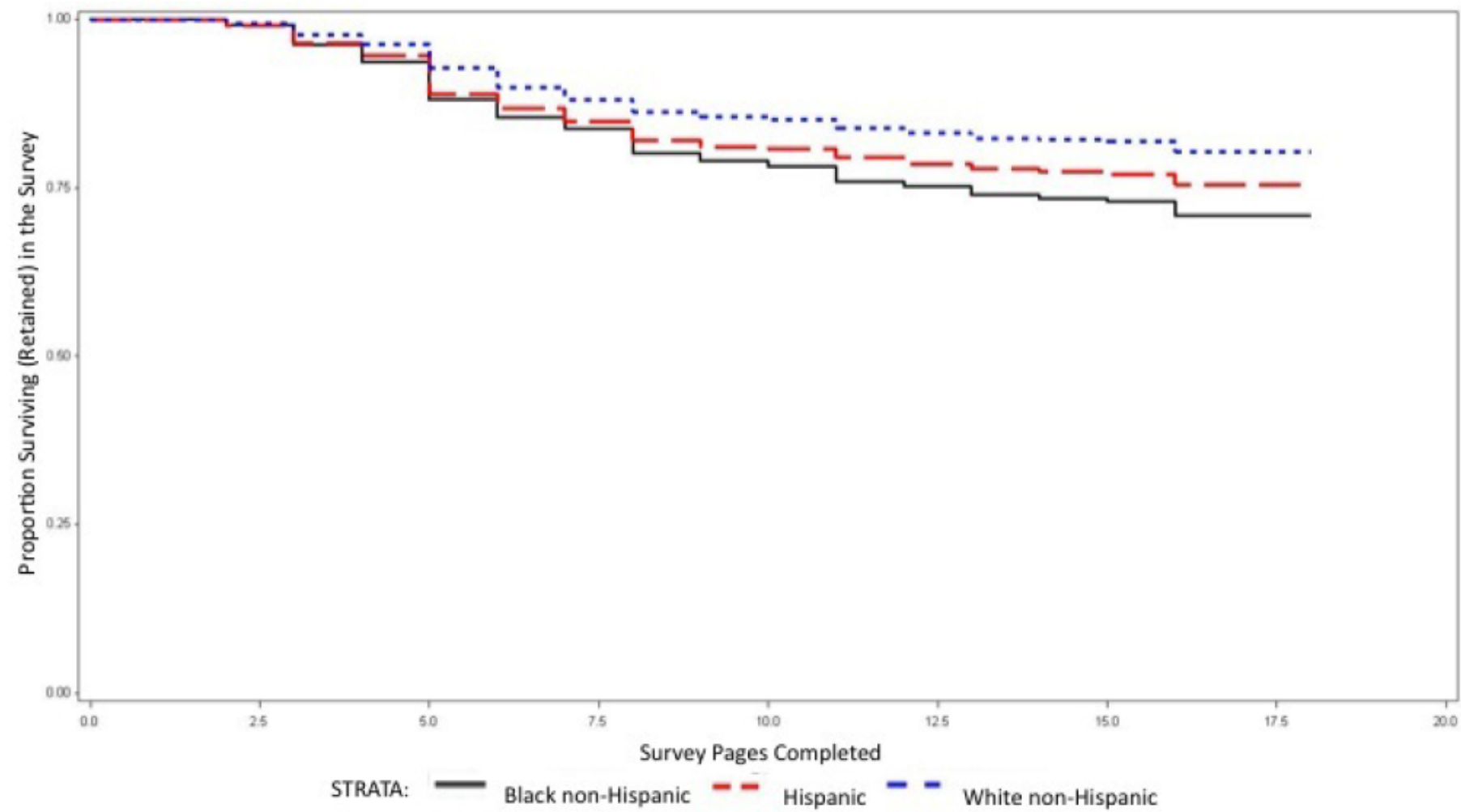


Table 2. Odds of clicking on study banner advertisements by MySpace.com users controlling for self-reported education, sexual identity, and race of model in advertisements and stratified by race of the MySpace.com user in the United States in 2009

	White Men	Black Men	Hispanic Men	Other Men
Characteristic	Adjusted OR (95% CI)	Adjusted OR (95% CI)	Adjusted OR (95% CI)	Adjusted OR (95% CI)
Education				
< High School (referent)				
> High School	0.99 (0.95 - 1.04)	<i>1.20 (1.14 - 1.26)^a</i>	<i>1.05 (1.01 - 1.10)</i>	<i>1.10 (1.04 - 1.16)</i>
Identity				
Unsure (referent)				
Gay	<i>2.10 (1.98 - 2.24)</i>	<i>1.62 (1.53 - 1.71)</i>	<i>1.45 (1.38 - 1.52)</i>	<i>3.07 (2.88 - 3.28)</i>
Bisexual	<i>1.63 (1.53 - 1.74)</i>	<i>1.78 (1.67 - 1.89)</i>	<i>1.58 (1.49 - 1.67)</i>	<i>2.83 (2.63 - 3.04)</i>
Race of model				
White (referent)				
Black	<i>0.74 (0.70 - 0.79)</i>	<i>1.83 (1.72 - 1.95)</i>	1.05 (0.99 - 1.11)	0.95 (0.89 - 1.00)
Asian	<i>1.56 (1.47 - 1.64)</i>	<i>1.46 (1.37 - 1.56)</i>	<i>1.70 (1.62 - 1.79)</i>	<i>1.61 (1.52 - 1.69)</i>

^aResults presented in italics denote significance at $P < .05$.

Figure 3. Retention in an online behavioral risk survey among participants reporting only male partners in the past 12 months, by race/ethnicity of the participants in the United States in 2009



[About Us](#)[News](#)[Annual Reports](#)[Survey Materials](#)[Publications](#)

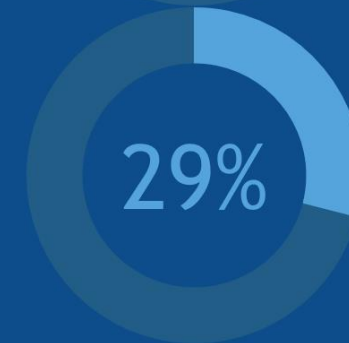
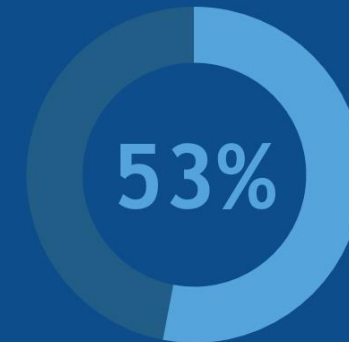
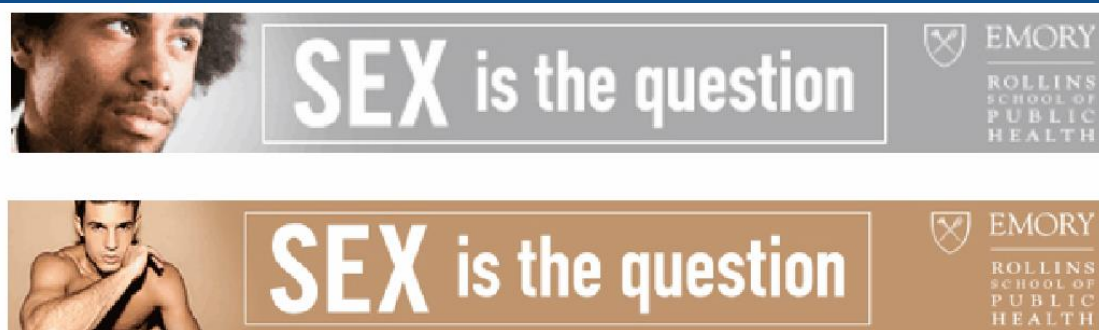
American Men's Internet Survey

4
10k+
52

Annual Data Collection Cycles to Date

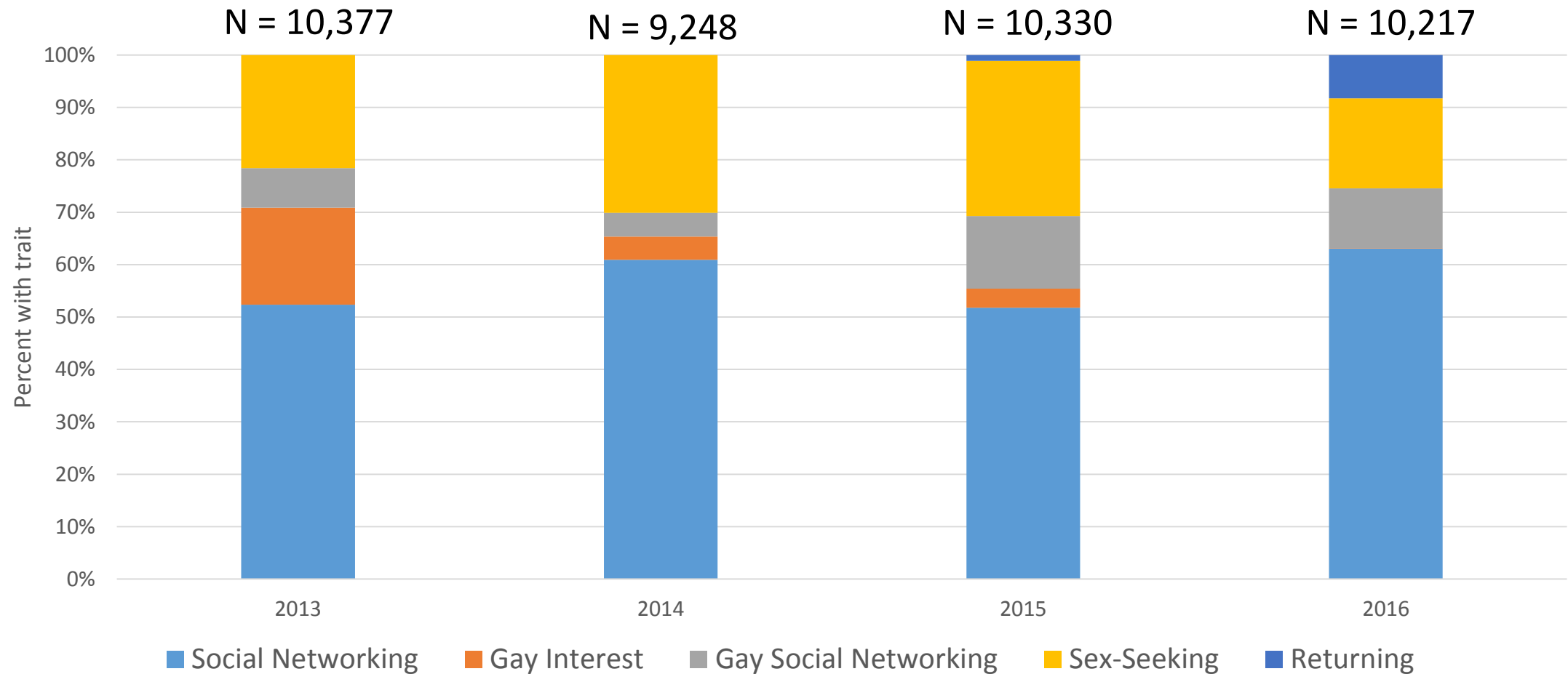
Surveys completed per year

States & Territories Represented



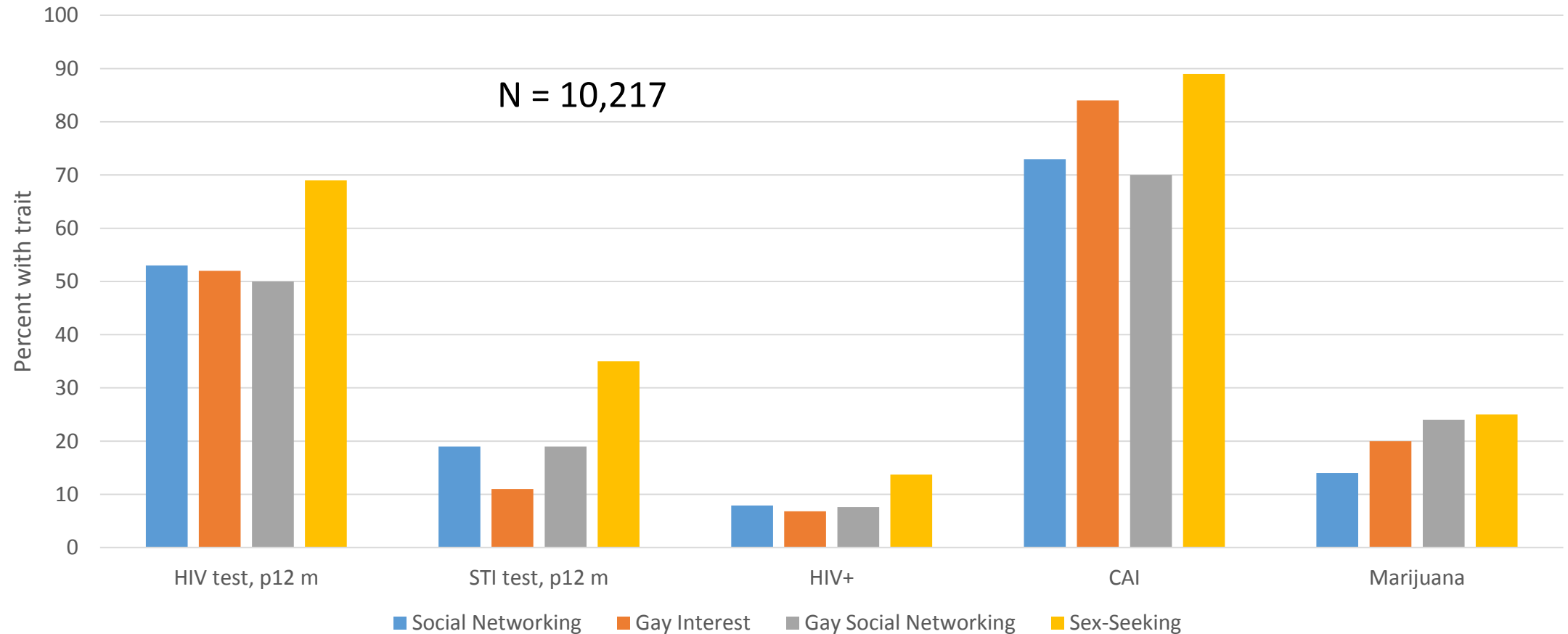
<http://emoryamis.org/>

Source of recruitment for MSM recruited through general social networking, general gay interest, gay social networking, and sex-seeking apps, AMIS, 2012-2016



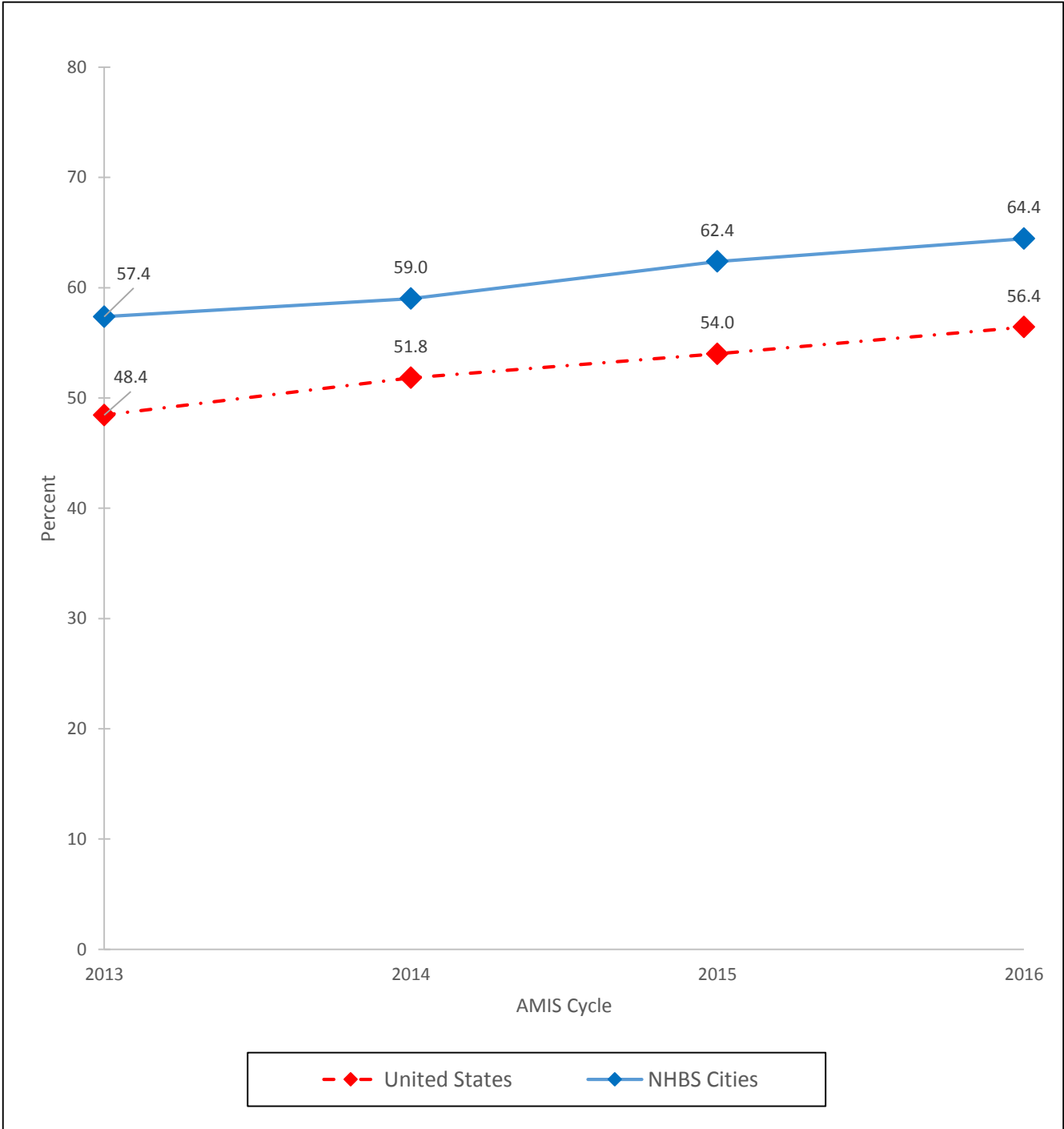
Source: Zlotprzynska et al, *JMIR Public Health Surveill* 2017;3(1):e13

Characteristics of MSM recruited through general social networking, general gay interest, gay social networking, and sex-seeking apps, 2016



Source: Zlotprzynska et al, *JMIR Public Health Surveill* 2017;3(1):e13

Proportion of HIV-negative or unknown status AMIS participants reporting any HIV testing, in the past 12 months, by AMIS cycle and residence (United States and NHBS cities). Estimated annual percentage change (EAPC) and 95% confidence intervals (95% CI) presented.



The Comparability of Men Who Have Sex With Men Recruited From Venue-Time-Space Sampling and Facebook: A Cohort Study

Alfonso C Hernandez-Romieu¹, MBBS, MPH; Patrick S Sullivan¹, DVM, PhD; Travis H Sanchez¹, MPH, DVM; Colleen F Kelley^{1,2}, MD, MPH; John L Peterson³, PhD; Carlos del Rio^{2,4}, MD; Laura F Salazar⁵, PhD; Paula M Frew^{2,6}, MPH, PhD; Eli S Rosenberg¹, PhD

¹Rollins School of Public Health, Department of Epidemiology, Emory University, Atlanta, GA, United States

- How to men recruited through Facebook, versus those recruited through VBS, differ in terms of STI and HIV prevalence, retention, and risk behaviors?

Risk and testing behaviors among Facebook versus VBS recruited, Atlanta, 2011-2014

FB < VBS

- # male partners
- Condomless sex partners

FB = VBS

- HIV+
- Rectal STI
- Syphilis
- Main partners
- Casual partners
- HIV testing
- Retention

FB > VBS

--

Summary

- MSM constitute the major risk group in the US HIV epidemic
- Black MSM, Hispanic MSM and young MSM are disproportionately impacted by HIV
- Historically MSM have been recruited through venues associated with risk (bars, clubs)
- Venue-based sampling is a systematic approach to sampling MSM
- Online sampling can access Black and Hispanic MSM, but are generally underrecruited.
- Race-concordant ads may increase recruitment efficiency for online recruitment for Black MSM
- Black MSM are more prone to loss to follow up within surveys and in prospective studies
- Online-recruited and venue-recruited samples of MSM can be combined

Acknowledgements

- Eli Rosenberg
- Travis Sanchez
- Aaron Siegler
- Christine Khosropour
- Kevin Delaney
- Alfonso Hernandez-Romieu
- PRISM Health Staff
- Research Participants

Supported by

NIAID
NIMH
NICHD
NIDA
CDC
Emory CFAR
The MAC AIDS Fund
Gilead Sciences