Trends in web-based HIV behavioural surveillance among gay and bisexual men in New Zealand: Complementing location-based surveillance

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Original article (1486 words)

Acknowledgements

The authors would like to thank the men who participated in the study and the website operators for allowing us access.

Disclosures and competing interests

None

Funding

PS conducted the research during tenure of a Health Sciences Career Development Award of the University of Otago. This work was supported by the Ministry of Health, the AIDS Epidemiology Group at the University of Otago Medical School and the Research Unit at the New Zealand AIDS Foundation.

Study Approval

Northern X Ethics Committee of the Ministry of Health.

Contributor statement

PS, ND and TH designed the study. PS project managed data collection, conducted the analysis and wrote the first draft. All authors contributed to the manuscript and approved the final version.

Abstract

Most HIV behavioural surveillance programmes for gay, bisexual and other men who have sex with men (MSM) sample from location-based (offline) or web-based (online) populations, but few combine these two streams. MSM sampled online have been found to differ demographically and behaviourally from those sampled offline, meaning trends identified in one system may not hold for the other. The aim was to examine trends among MSM responding to supplementary repeat online behavioural surveillance surveys who had not participated in offline surveillance earlier that year in the same city, to see whether trends were parallel, converged or diverged. We recruited a total of 1613 MSM from an Internet dating site in Auckland, New Zealand in 2006, 2008 and 2011 using identical questionnaires and eligibility criteria to offline surveillance. Condom use was stable over time, HIV testing rates rose, the proportion reporting over 20 recent male partners declined, and anal intercourse rates increased, consistent with trends in offline surveillance conducted concomitantly and reported elsewhere. Variant trends included greater stability in condom use with casual partners among online-recruited MSM, and a rise in regular fuckbuddy partnering not identified among offline-recruited MSM. Among MSM recruited online, the frequency of checking internet dating profiles increased between 2008-2011. In conclusion, supplementary web-based behavioural surveillance among MSM generally corroborates trends identified in offline surveillance. There are however some divergent trends, that would have been overlooked if only one form of surveillance had been conducted. As MSM populations increasingly shift their socializing patterns online and diversify, multiple forms of HIV behavioural monitoring may be required.

Abstract 257 words (300 maximum)

Key words:

Gay men; HIV; sexual behaviour; surveillance, Internet, sampling

Introduction

HIV behavioural surveillance involving repeated surveys monitors the response of most-at-risk populations to HIV control efforts and directs future interventions. The majority of behavioural surveillance programmes for gay, bisexual and other men who have sex with men (MSM) internationally employ cross-sectional purposive sampling of location-based or web-based populations (Elford et al., 2009; Raymond et al., 2010; Sanchez, Smith, Denson, Dinenno, & Lansky, 2012a; Paquette & De Wit, 2010). However, few combine these sampling streams. MSM sampled online have been found to differ demographically and behaviourally from those sampled offline (Elford, Bolding, Davis, Sherr, & Hart, 2004; Grov 2012; Lewnard & Berring-Ford, 2014; Sanchez, Smith, Denson, Dinenno, & Lansky, 2012b; Saxton, Dickson, & Hughes, 2013; Voetsch et al., 2012; Zhang, Bi, Lv, & Hiller, 2008), suggesting trends identified in one system may not generalise to the other. Trends in both systems should therefore be examined to see whether these are parallel, convergent or divergent.

New Zealand conducts location-based and web-based behavioural surveillance among MSM in the largest city, Auckland (Saxton et al., 2013), meaning trends can be compared. Previous analyses found that MSM recruited in web-based surveillance reported different sexual partnering patterns, lower condom use and lower HIV testing rates compared to MSM recruited in location-based surveillance (2013). A subsequent analysis of trends in location-based surveillance found that condom use was stable over time, with increased HIV testing and declining rates of partner change (Saxton, Dickson, & Hughes, 2014).

The aim of the current paper is to examine trends among MSM from the companion web-based behavioural surveillance, and whether these corroborate trends previously identified among MSM in location-based surveillance.

Methods

Data collection

The Gay men's Online Sex Survey (GOSS) surveyed MSM with profiles on New Zealand's most popular Internet dating site (NZDating.com) over 2-3 weeks in 2006, 2008 and 2011. An electronic banner promoting GOSS was visible for users; clicking on the banner launched the study web page, participant information sheet and screening questions. Eligibility criteria were being male aged 16 or over and having had sex with a male in the previous five years. Participation was voluntary, anonymous and self-completed and there were no study incentives. Completion took 5-12 minutes. The questionnaire and approach was identical to that used in the Gay Auckland Periodic Sex Survey (GAPSS), a companion survey which recruited MSM from gay community locations (a large gay pride picnic, gay bars, saunas, cruise clubs) in the month prior (Saxton et al., 2014). Men who had already taken part in GAPSS that year were ineligible to participate subsequently in GOSS. Thus GOSS provided us with a sample of MSM who were not represented in the location-based GAPSS surveillance in that round. To promote comparability the GOSS sample in this analysis is limited to MSM living in Auckland. Ethics approval was received from Northern X Ethics Committee. Details of the GAPSS and GOSS methods are provided elsewhere (Saxton et al., 2013).

Measures

Respondents reporting casual sex or a current regular partner were asked about receptive and insertive anal intercourse with each partner type, and for any anal intercourse, condom use over the past 6 months on a 5–point scale (“always”, “almost always”, “about half the time”, “very rarely” or “never”).

We report the same four main sets of indicators examined previously for location-based behavioural surveillance of MSM in this city. These are i) condom use always or almost always (high condom use) and ii) any unprotected anal intercourse (anyUAI) among those engaging in anal intercourse, stratified by partner type (casual, current regular fuckbuddy-type, current regular boyfriend-type); iii) anyUAI as a proportion of the total sample, and stratified by partner type; and iv) HIV testing ever and in the previous 12 months among non-previously diagnosed respondents.

For analysis of respondent characteristics, sexual partnering and behaviour variables we conducted a chi-squared test for heterogeneity and for trend across the three surveys 2006-2011. Adjusted odds ratios with 95% confidence intervals (AOR 95% CI) controlling for age examined change between successive surveys. Analyses were conducted using Stata version 11.

Results

Respondent characteristics

In the 2006, 2008 and 2011 rounds we recruited 647, 443 and 523 MSM in Auckland respectively. Compared to respondents recruited online in 2006, those sampled online in 2011 were slightly older, more ethnically diverse, more gay identified, more likely to have tested HIV positive, and spent less of their free time with other homosexual men (Table 1). In 2006 18.2% reported going online more than once a day to check their profile which rose to a quarter (24.8%) of respondents in 2011 (p for trend=0.021).

[insert Table 1 about here]

Sexual partnering and practices

There was a modest decline in the proportion reporting over 20 male sexual contacts (12.8% in 2006 to 9.3% in 2011, p for trend =0.045) (Table 2). In contrast, more respondents reported a recent casual partner or a current fuckbuddy partner. Likewise, of respondents who had sex with a given partner type, there was a significantly increasing proportion engaging in anal intercourse among those with casual partners (75.9% in 2006 to 83.4% in 2011, p for trend =0.004) and those with a current boyfriend (81.7% in 2006 to 91.4% in 2011, p for trend =0.027). The proportion reporting that they had sex with a man they had met online also increased from 2006 (74.9%) to 2008 (83.4%) (p <0.001), although this question was not repeated in 2011.

[insert Table 2 about here]

Condom use and HIV testing

Of respondents having anal intercourse, the proportion reporting high condom use (always or almost always) or engaging in anyUAI (i.e. at least one episode of unprotected anal intercourse) was stable across all three partnering contexts (casual, fuckbuddy, boyfriend) between 2006-2011 (Table 3). When the denominator was expanded to describe the incidence of anyUAI among the whole sample, there was no significant trend found among casual or boyfriend partners, although the proportion who had engaged in anyUAI with a current fuckbuddy was found to be higher in 2011 than in previous survey rounds (p for trend = 0.019).

The proportion having ever tested for HIV increased over time (p for trend=0.001) as did the rate of testing for HIV in the preceding 12 months among non-tested positive respondents (p for trend<0.001).

The inter-survey trends in behaviours remained after adjusting for age in logistic regression analysis, with the exception of the increase in anyUAI with a fuckbuddy in 2011 in the context of the total sample (this was only marginally significant between 2008 and 2011; AOR 1.5 95% CI 0.98-2.3).

[insert Table 3 about here]

DISCUSSION

In these supplementary repeat web-based surveys of MSM, trends in behaviours largely paralleled those previously observed in location-based surveillance over this period (Saxton et

al., 2014). HIV testing increased over time, and condom use with casual, fuckbuddy and boyfriend-type partners was stable. Declines in the proportion reporting over 20 recent male partners contrasted with increases in sexual partnering with certain partner types, and also with wide scale increases in the proportion engaging in anal intercourse. Our generally synchronous trends with those found among MSM recruited offline in the same city are punctuated by three notable differences, highlighted below.

First, unlike location-based surveillance which identified a slight decrease in condom use with casual partners in 2011 (Saxton et al., 2014), web-based surveillance reported steady rates over the three surveys. Second, among offline recruited MSM there were no changes in the proportion reporting a current fuckbuddy (2014), whereas in this study of online recruited MSM this was found to have increased from 2008 to 2011. A third finding was an increase in the frequency of checking personal profiles among MSM recruited from Internet dating sites, witnessed between 2008 and 2011.

Limitations of our data are that they are from repeat cross-sectional purposive surveys based on self-reported behaviours. The demographic characteristics of web-based respondents changed over time, although these shifts were generally linear and were also observed among MSM recruited offline (Saxton et al., 2014). Without representative samples we cannot be sure whether this reflects secular trends among MSM generally, demographic shifts peculiar to MSM using the Internet dating sites, or to variations over time in participation rates among dating site users. Surveillance trends also need to consider the possibility of “sample drift” over time

(Saxton et al. 2013), and high and increasing internet penetration in New Zealand (Statistics New Zealand, 2013).

Notable is the apparent contradictory pattern of fewer respondents reporting very large partner numbers but more contact with casual and fuckbuddy partners and more anal intercourse. This could be explained by improvements in sexual sorting facilitated by Internet dating, what Grov and colleagues have called “expedited” encounters (Grov, Breslow, Newcomb, Rosenberger, & Bauermeister, 2014). Counterintuitively, the increasing ubiquity of web-based dating tools could therefore be leading to reductions in the number of sexual partners for some MSM, due to more efficient searching, even as the potential pool of sexual contacts becomes ever greater.

Further research should investigate the relationship between developments in web-based technologies, sexual ecology and sexual sorting among MSM. Multiple behavioural surveillance systems including web-based and location-based programmes may be needed to capture these dynamics accurately, provide a more complete picture of partnering trends, and improve HIV control efforts.

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Table 1. Sample characteristics by survey round; web-based behavioural surveillance of MSM in Auckland, New Zealand (percentage).

	2006 n=647	2008 n=443	2011 n=523	Chi^2 heterogeneity p-value	Chi2 trend
Mean age (years)	34.1 (33.1-35.0)	33.3 (32.2-34.4)	35.1 (34.1-36.2)	N/A	N/A
Age group					
<30	44.1	45.0	40.1	**0.034**	**0.048**
30-44	37.7	38.8	35.9		
45+	18.2	16.3	24.0		
Ethnicity					
European	77.8	68.0	65.8	**<0.001**	**<0.001**
Maori	8.4	9.5	10.2		
Pacific	4.4	4.5	4.2		
Asian	4.3	12.9	12.5		
Other	5.2	5.0	7.3		
Sexual identity					
Gay	60.1	70.4	67.5	**0.001**	**0.005**
Bisexual or other	39.9	29.6	32.5		
Free time spent with gay men					
A lot	24.4	22.6	18.1	**0.036**	**0.012**
Some, a little, none	75.6	77.4	81.9		
Frequency of going online to look for men in previous month					
More than once a day	18.2	18.3	24.8	**0.05**	**0.021**
Once a day	19.3	19.5	16.3		
A few days a week	27.5	30.1	29.4		
Once a week or less	35.1	32.1	29.6		
HIV test status					
HIV positive	1.4	2.1	3.3	0.108	**0.037**

Table 2. Sexual partnering in previous 6 months by survey round; web-based behavioural surveillance of MSM in Auckland, New Zealand (percentage).

	2006 n=647	2008 n=443	2011 n=523	Chi^2 heterogeneity p-value	Chi2 trend
Sex with a man met online	74.9	83.4	- *	**<0.001**	**<0.001**
>20 male partners	12.8	8.9	9.3	0.064	**0.045**
Partner types					
Any casual partner	81.1	77.8	84.6	**0.025**	0.160
Current fuckbuddy	19.7	19.0	24.7	0.054	**0.047**
Current boyfriend	22.2	19.2	18.2	0.218	0.091
Anal intercourse†					
With casual partner/s	75.9	81.7	83.4	**0.010**	**0.004**
With fuckbuddy	82.5	81.9	86.5	0.593	0.392
With boyfriend	81.7	89.3	91.4	0.071	**0.027**

* not asked in same form.

† as a proportion of respondents with that partner type.

Table 3. Main indicators by survey round; location-based behavioural surveillance of MSM in Auckland, New Zealand (percentage, AOR 95% CI vs previous survey round).

	2006 n=647	2008 n=443	2011 n=523	p for trend
High condom use*				
Casual partners	74.4	79.0 1.3 (0.9-1.9)	76.6 0.9 (0.6-1.3)	0.464
Fuckbuddy	60.6	59.7 0.9 (0.5-1.6)	58.7 1.0 (0.5-2.0)	0.782
Boyfriend	32.8	35.1 1.2 (0.6-2.2)	35.3 1.0 (0.5-2.0)	0.697
AnyUAI*				
Casual	48.1	43.0 0.8 (0.6-1.1)	45.8 1.1 (0.8-1.6)	0.513
Fuckbuddy	51.0	55.9 1.3 (0.7-2.4)	58.7 1.1 (0.6-2.1)	0.257
Boyfriend	75.0	70.7 0.8 (0.4-1.5)	71.8 1.0 (0.5-2.1)	0.585
AnyUAI, total sample †				
Casual	29.6	27.3 0.9 (0.7-1.2)	32.3 1.3 (0.9-1.7)	0.355
Fuckbuddy	8.3	8.7 1.1 (0.7-1.7)	12.5 1.5 (0.98-2.3)	**0.019**
Boyfriend	13.6	12.1 0.9 (0.6-1.2)	11.9 1.0 (0.7-1.5)	0.394
HIV testing				
Ever	60.7	67.1 **1.3 (1.03-1.7)**	70.6 1.2 (0.9-1.5)	**0.001**
<12 months ‡	34.4	38.7 1.2 (0.9-1.6)	45.5 **1.3 (1.01-1.7**)	**<0.001**

High condom use=always or almost always used condom during anal intercourse. AnyUAI=any unprotected anal intercourse. AOR (95% CI)=odds ratio adjusted for age and recruitment site with 95% confidence interval, referent is previous survey round.

* as a proportion of respondents engaging in anal intercourse with that partner type.

† as a proportion of total sample.

‡ excluding respondents diagnosed with HIV greater than 12 months previously.